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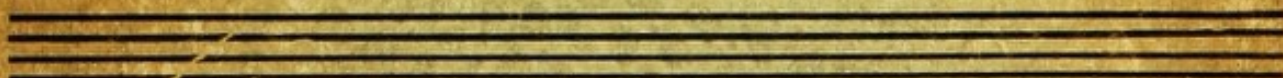


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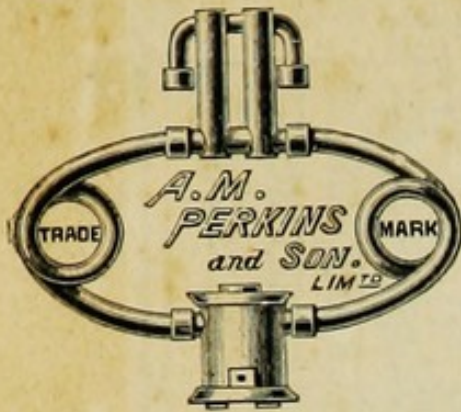
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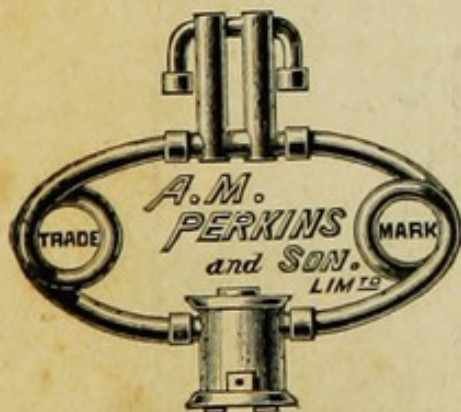
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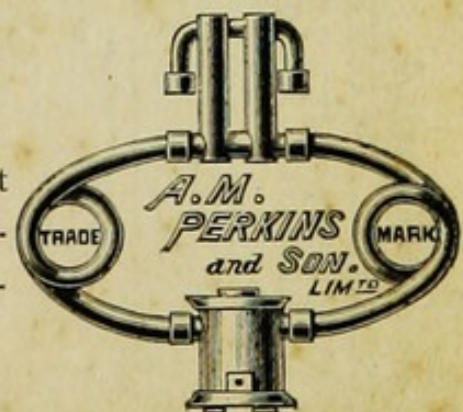
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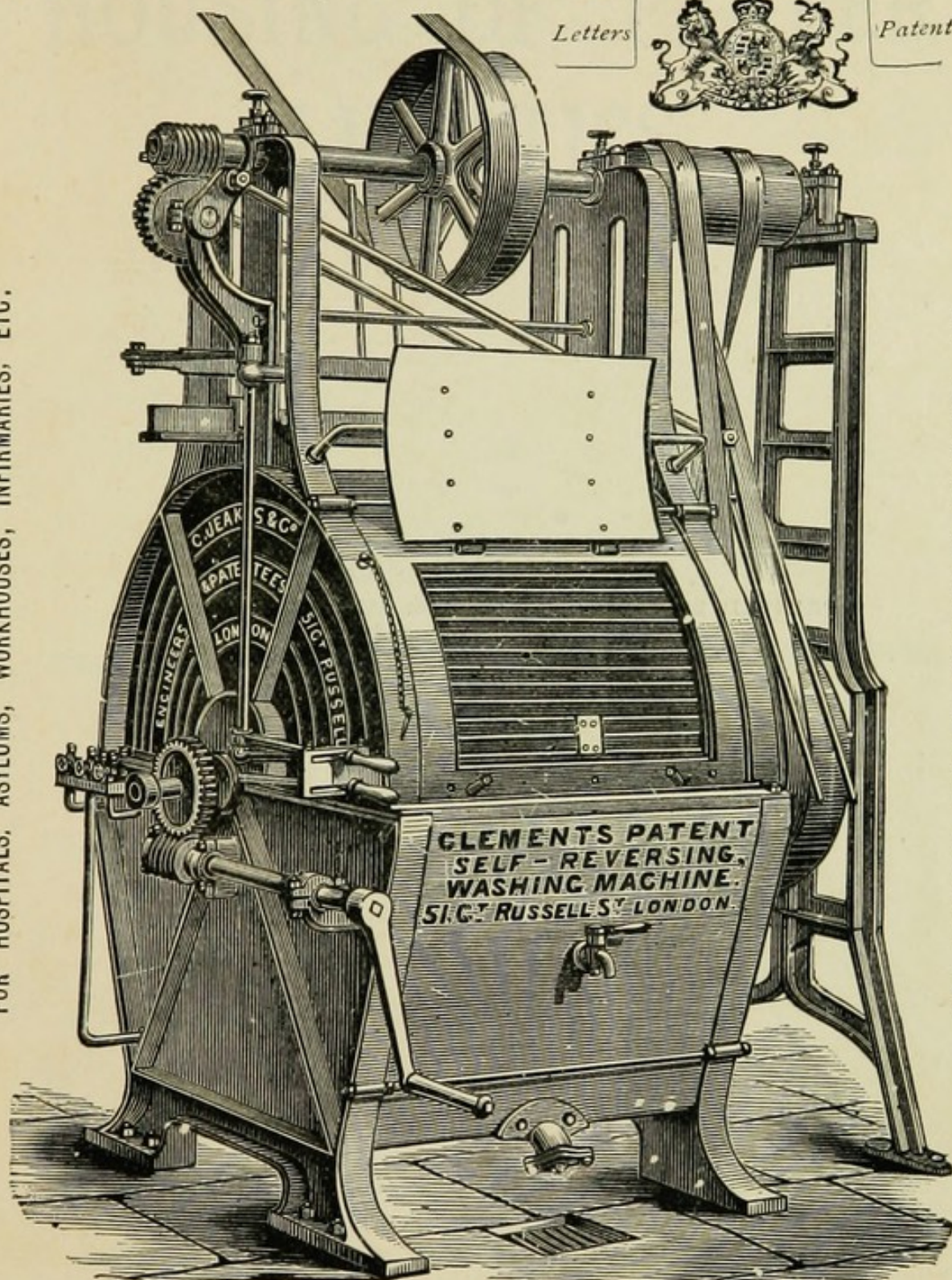
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THE
HOUSING OF PAUPER
LUNATICS.

BY

GEORGE HENRY BIBBY,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



1895.

PUBLISHED BY

BRADLEY T. BATSFORD, 94, High Holborn, W.C. ; and
G. H. BIBBY, "The Limes," North End, Hampstead, N.W.

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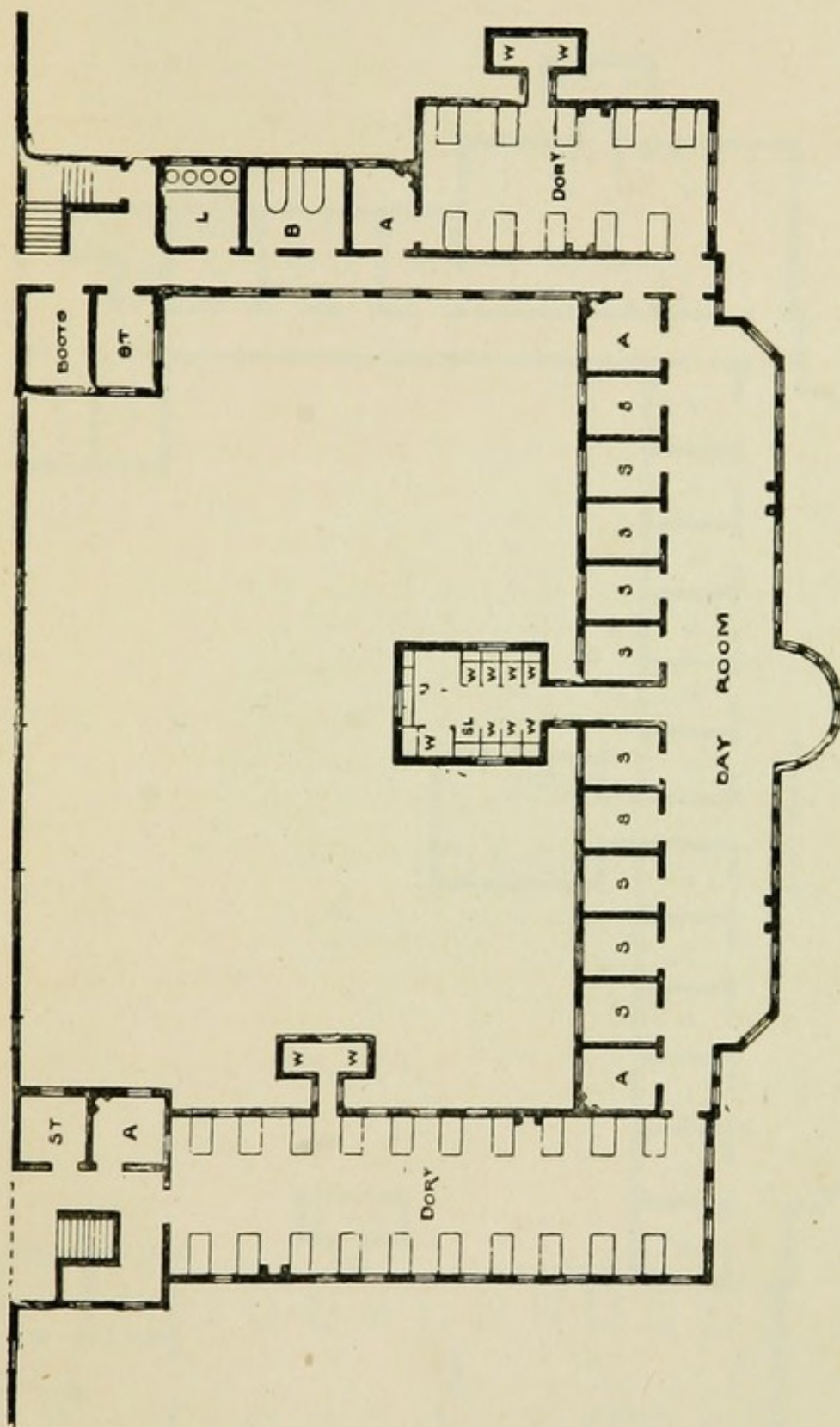
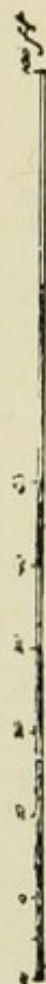
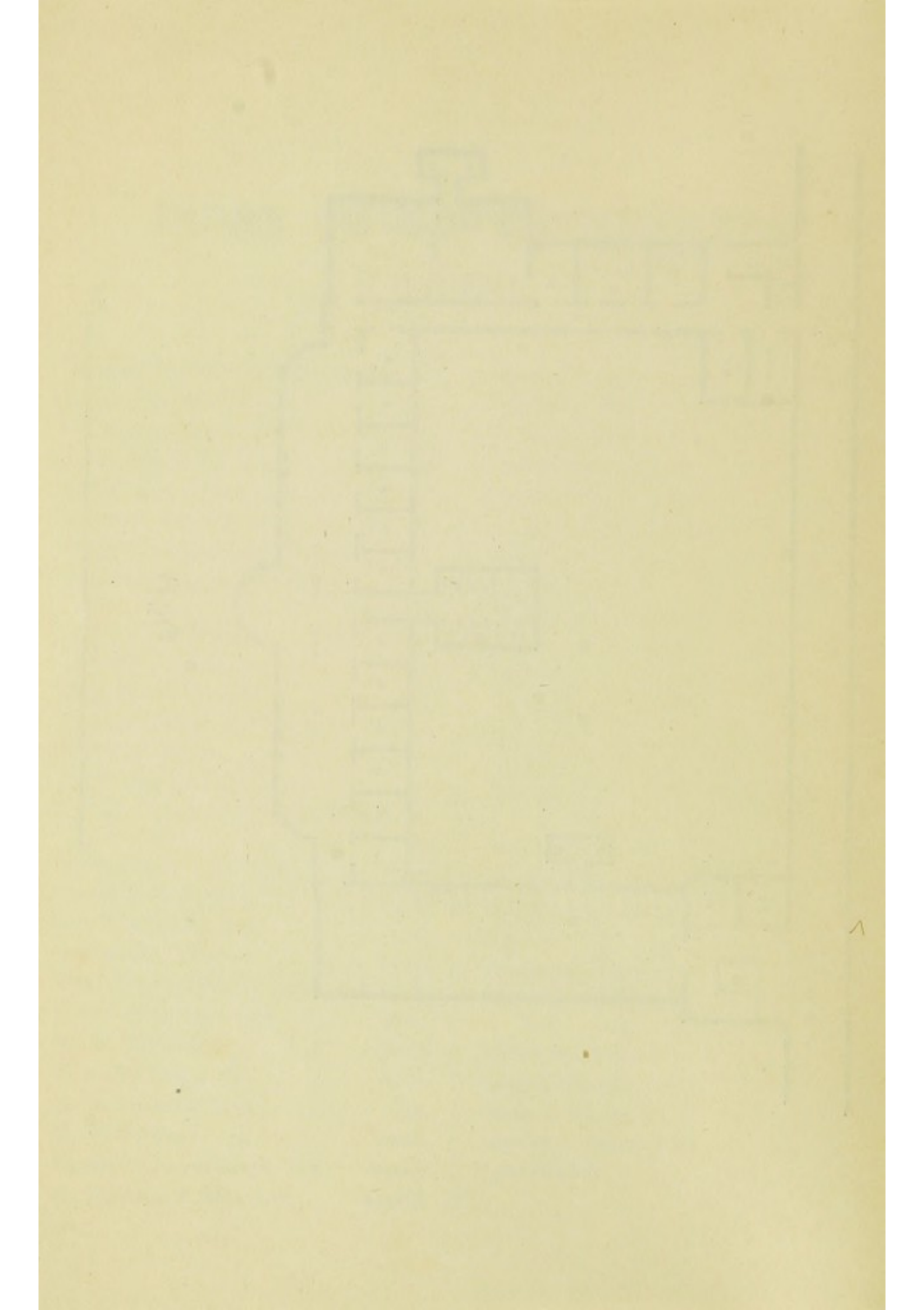


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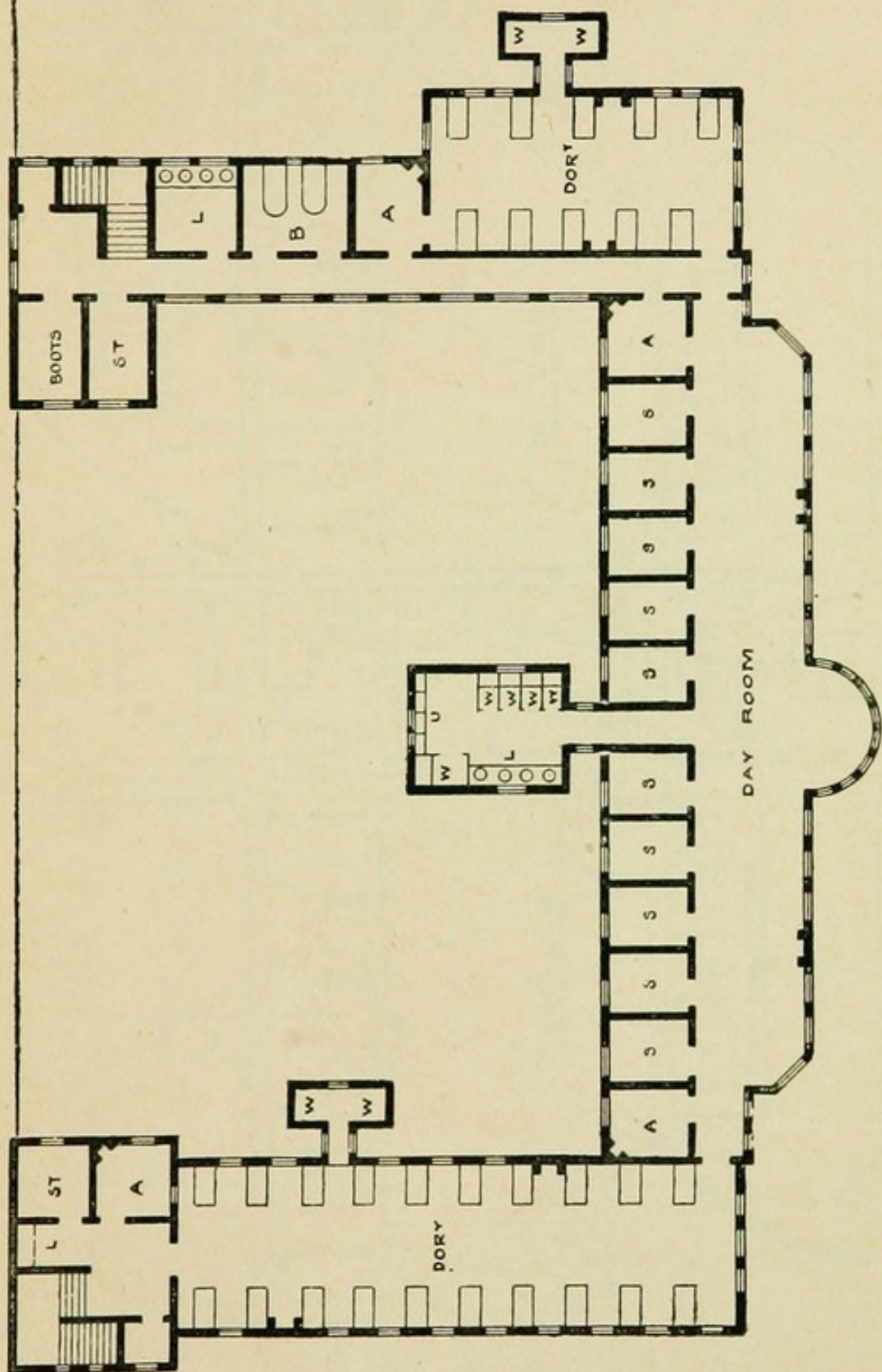
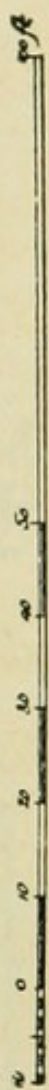
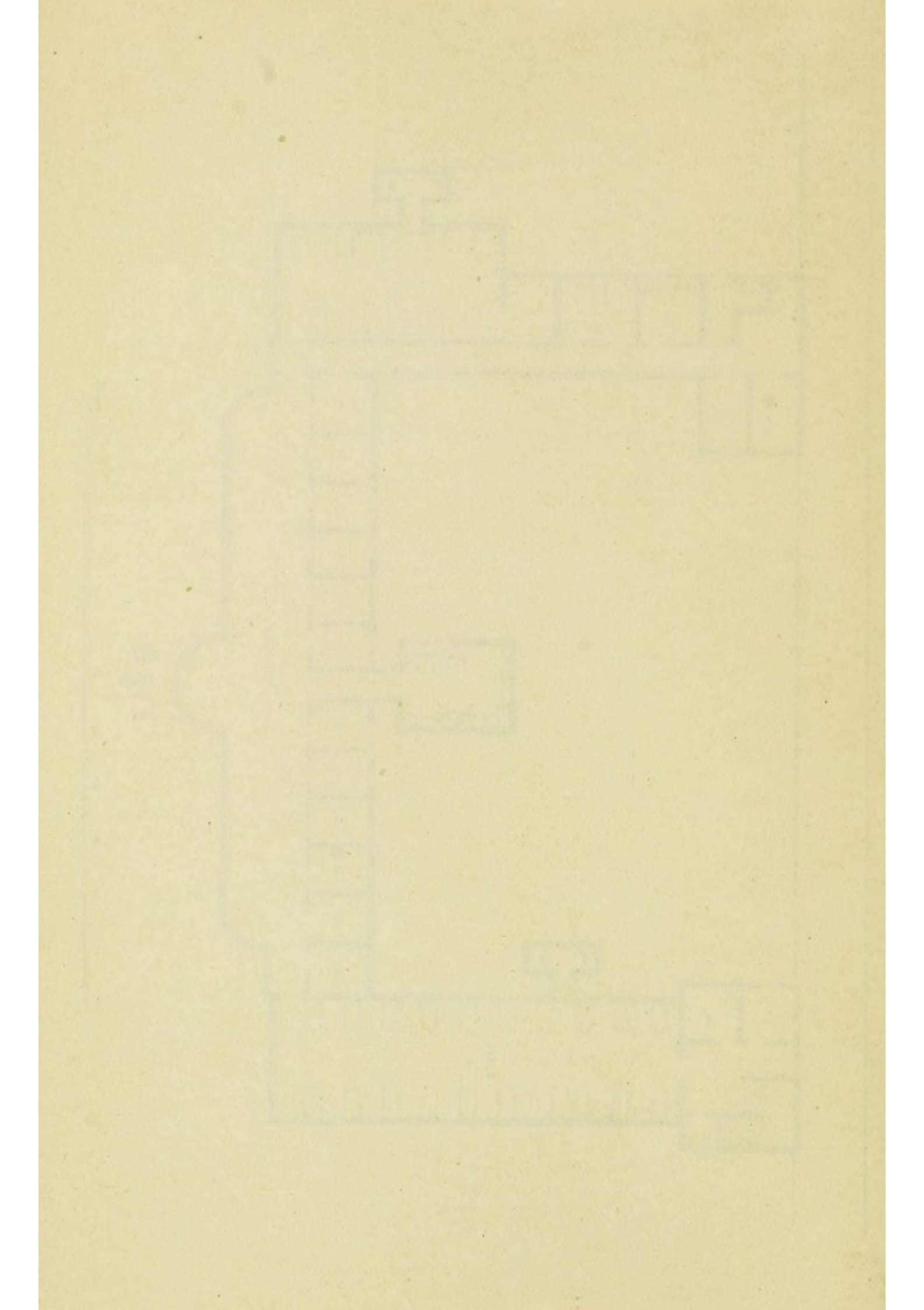


Fig B





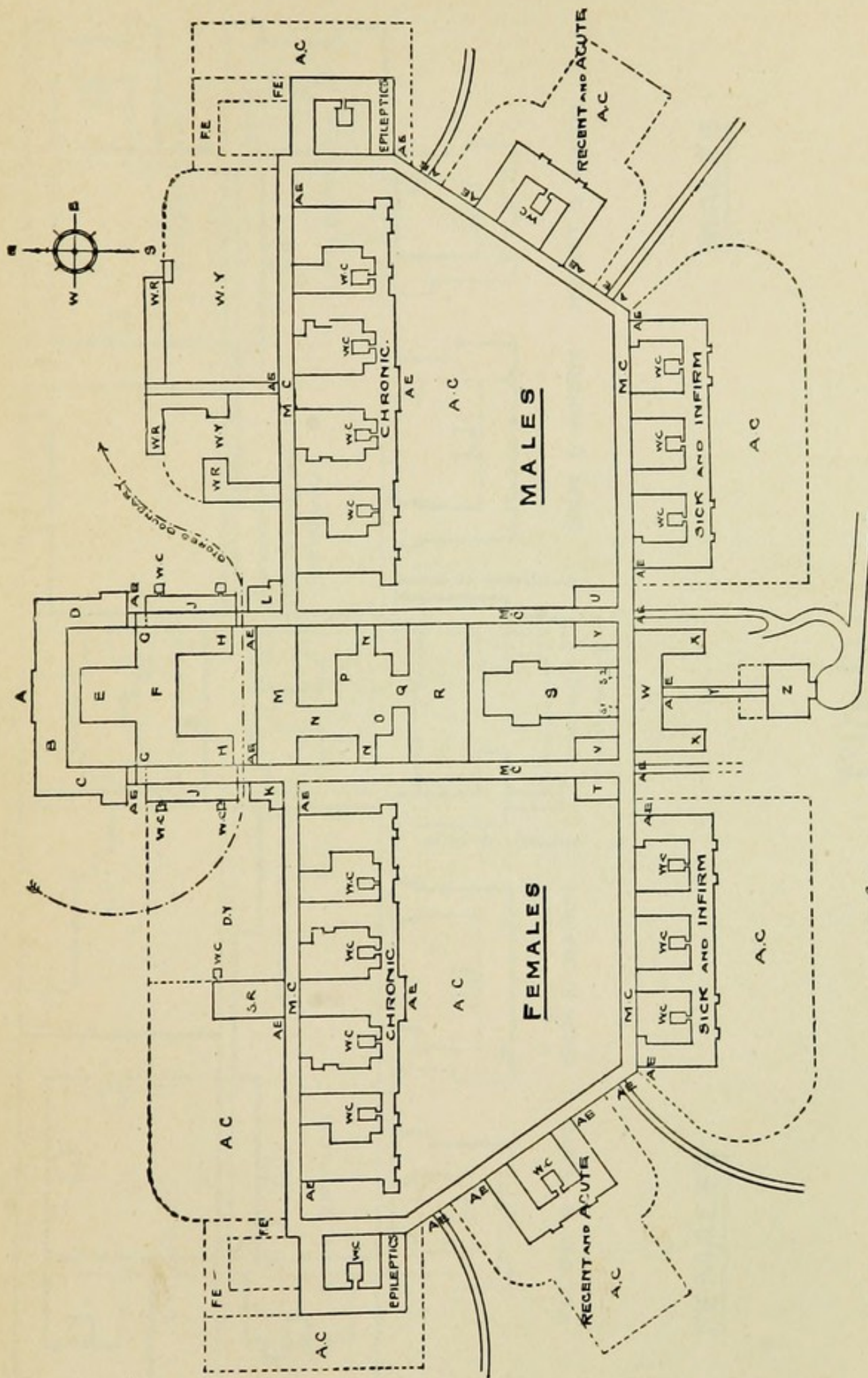


Fig. C:

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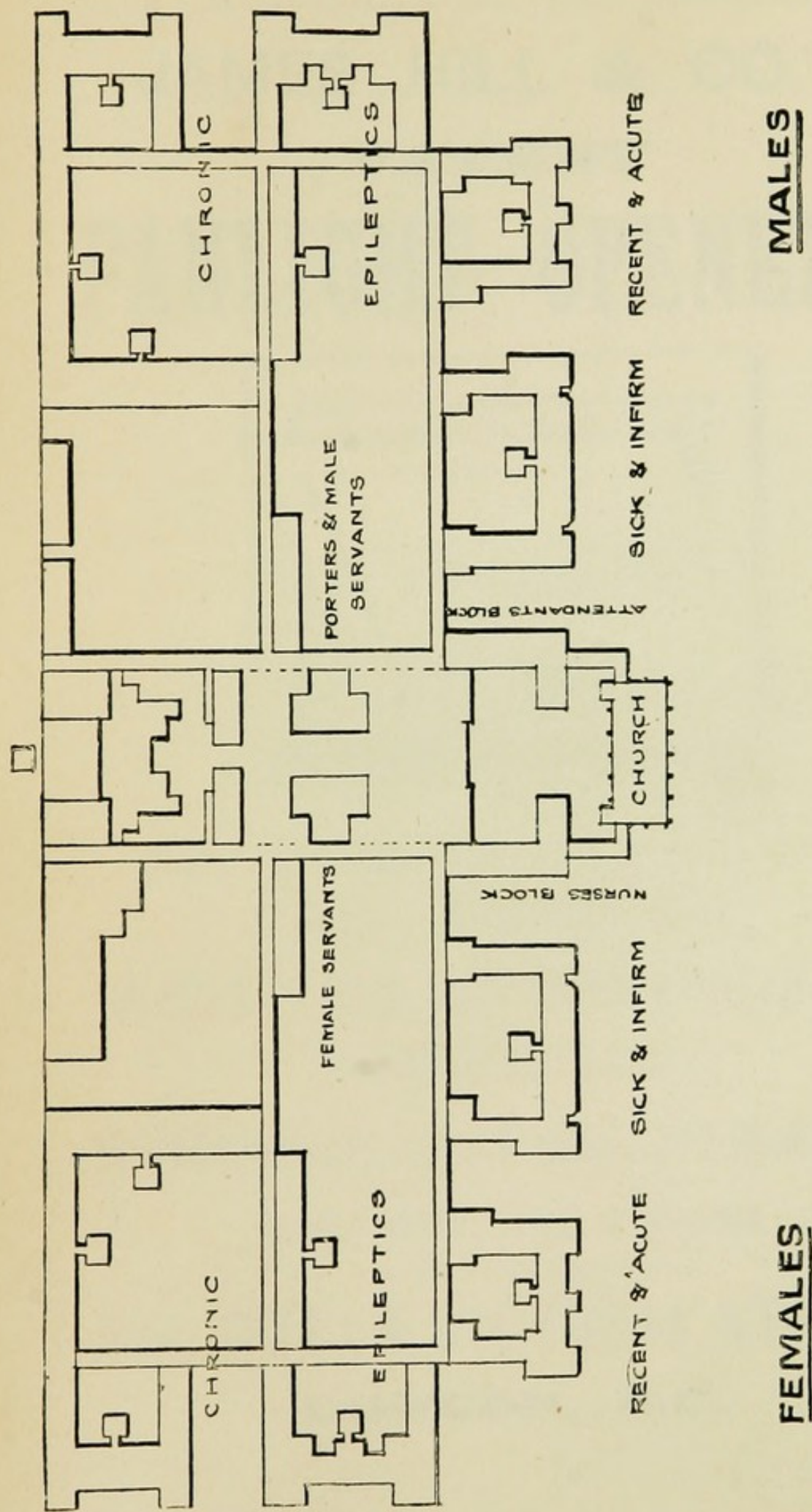
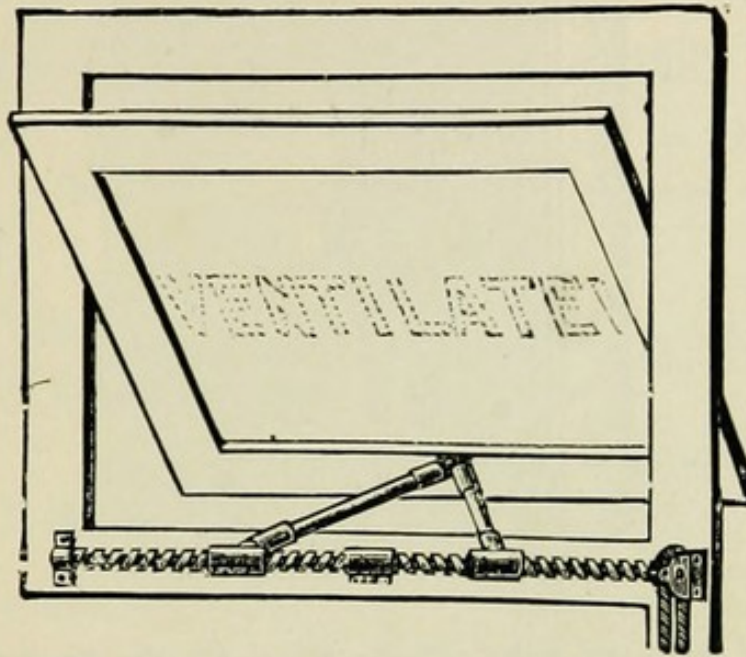


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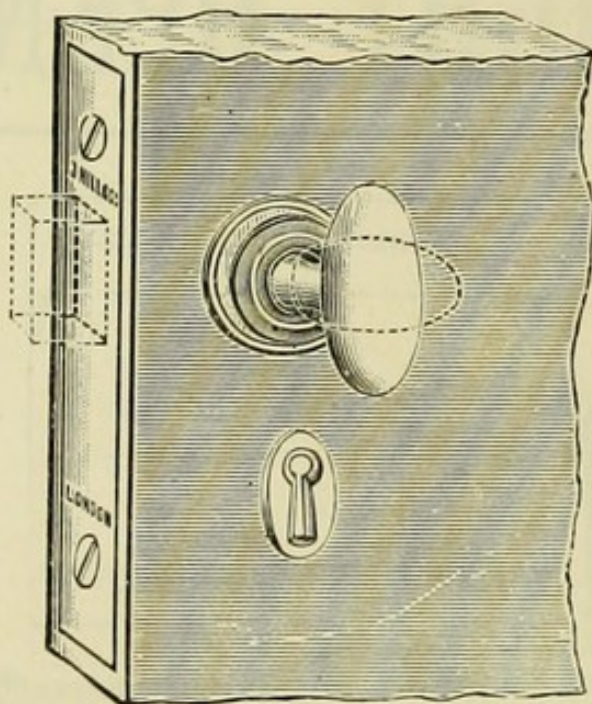
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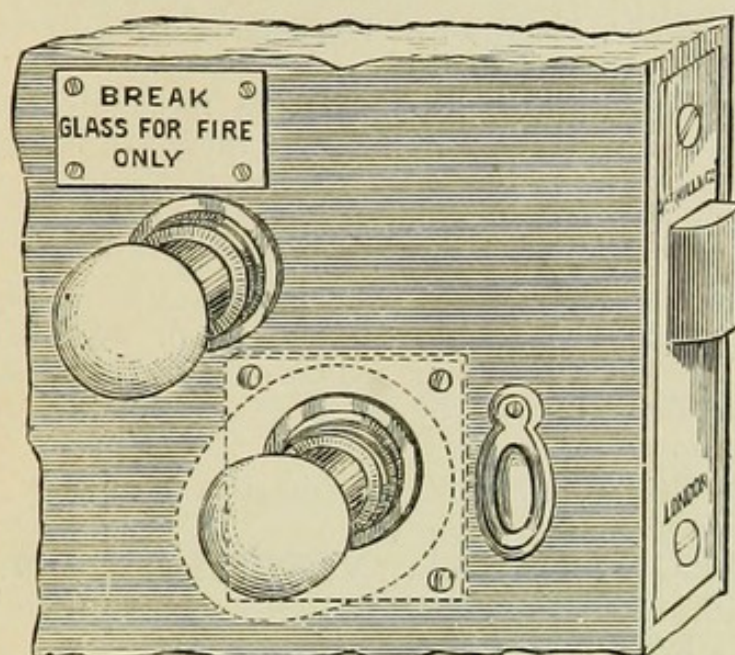


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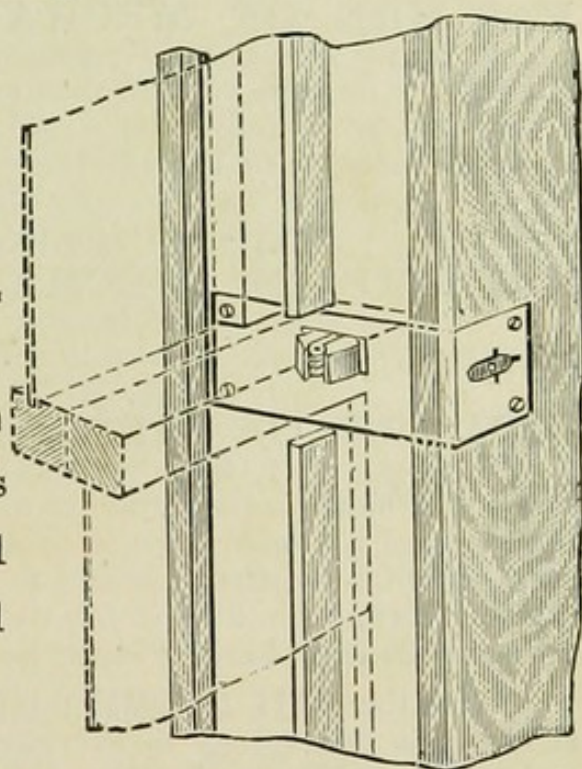
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THE
HOUSING OF PAUPER LUNATICS,

BY

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—o—

CHAPTER I.

VERCROWDING is now regarded as the greatest evil of the present asylum system.

The highest scientific treatment is available in many asylums, but the patients are so closely massed that the curable are often placed under adverse circumstances retarding their chance of recovery. Asylum committees and medical superintendents are compelled to fall in with the ratepayers' demands for economy, who lose sight of the fact that a larger sum per head should be expended upon recent cases (say of less than nine months' residence) and that the reception wards for recent cases should be greatly increased in number.

In the year 1744 the first Act of Parliament was passed in this country to control the working of these institutions, since which period the changes and improvements have been so vast and manifold, that we are unable to realize the terrible scenes that were enacted in the dark days of the past, when insanity was treated almost as a crime, and patients were

chained, caged and chastised like wild beasts ; their keepers frequently deriving an income from their exhibition. At that period they were frequently kept huddled together without discrimination as to sex, and it was not an uncommon sight to see large numbers of patients in a room, chained to the wall, suffering from many kinds of diseases and various types of insanity. The condition of the female patients was particularly distressing ; herded together, as they were, in numbers, crawling on their knees, half clothed, some, indeed, with but a piece of cloth tied round their waist by a length of cord or rope.

This ignorant treatment of insanity in the eighteenth century is in great contrast with that given in the fourteenth century to the King Charles VI. of France, described by Froissart in his chronicles which mention one Master William de Harseley, who cured the king of his insanity by a common-sense system, resembling in its details some of our modern methods, endeavouring to bring back to him his appetite, sleep and recollections of things about him, and allowing the patient to ride, hunt, and amuse himself with hawking. But while this learned physician of the day was thus proceeding with care and success, others adopted such measures as the following (*vide* Froissart) :—

“In a church at Haspres, in Hainault, dependent on the abbey of St. Vast at Arras, lies the canonized body of St. Aquaire, in a rich silver shrine. This saint is celebrated for the cures he has performed on

those afflicted with madness, and on that account is much visited from all parts. To pay due respect to the saint, there was made a figure of wax, resembling the king, which was sent thither with a large wax taper, and offered with much devotion at the shrine of the saint, that he might pray to God to alleviate this cruel affliction of the king. A similar offering was made to Saint Hermier, in Rouais, who has the reputation of curing madness; and wherever there were saints supposed to have efficacy by their prayers to God in such disorders, thither were sent offerings from the king with much ceremony and devotion."

There is evidence to show that Harseley was held in great esteem for his services in restoring the king to his senses and memory, for Froissart says:—"It was thought desirable to retain him in the king's service, but he excused himself, and so was permitted to depart, being presented with 1,000 crowns of gold and an order for four horses on the post-master whenever he should please to come to Court."

A modern asylum doctor, writing anonymously, said:—"The public shun asylums and lunatics, and it is impossible to overrate the mischief which is caused by this manner of regarding insanity. The difficulties of treatment are thereby enormously increased. People of leisure are now-a-days finding much pleasure in visiting the poor and ignorant. There is no place where a word of sympathy from them would be more valued than in asylums. There is an unexplored world of charity at their door."

A very large number of the insane are brought under treatment far too late. In its first stages insanity is frequently curable, and on its appearance help against it should be sought without a day's delay, since every hour adds to the difficulty of cure, and after a delay of two or three months, relief (perhaps a long relief) may indeed be obtained, but cure may have become nearly impossible.

These facts are, however, far better known and understood than was the case some twenty-five years ago, and one result is that a far larger proportion of the population are under asylum treatment; but the increase of insane patients arises from various causes beyond the inclusion of a class who were formerly neglected, under unsuitable private care, wandering about the country, or indiscriminately mingled with the workhouse inmates, and merely classified as paupers—as is still the case in many districts in England, Ireland, and Scotland.

The special importance of the subject to architects will be perceived if it be remembered that there are in England alone no less than 170 asylums (public and private), and that some of these have cost (exclusive of land and furnishing, &c.) so much as £500,000, the price per patient varying from £80 to £250, or £300 in special cases.

In Scotland there are about 50 asylums (including lunatic wards and poorhouses), and there are 42 asylums in Ireland, where, however, there are also no less than 4,334 lunatics and imbeciles confined in

union workhouses. Many of the asylums in Ireland appear to be wholly insufficient for their purposes ; for instance, the Richmond Asylum, near Dublin, is so overcrowded as to act most injuriously on the patients' health, and materially lessen the prospects of their recovery, and to disorder every department of that institution. In this asylum the female observation dormitories are (or were lately) so overcrowded that not only were the beds placed side by side, but mattresses have had to be placed on the floor to provide for additional patients ! In view of the constantly increasing numbers of the insane, of the utter unsuitability of many of the older asylums (and some of the more recent), there appears to be a great probability of extensive asylum works in all parts of these islands, and of considerable work for architects and the building trades.

In actual practice, the architect who is intrusted with the erection of a large asylum will always find it of great importance to have facilities for consulting from first to last a well experienced medical officer, and it would be well, when a new asylum is projected, that the medical officer should be appointed to the asylum before it is erected. If this were always done, much loss and trouble would be avoided in alterations, etc. In times past I well recollect (although nearly thirty years since) a great medical authority on the subject of insanity taking a temporary seat in an architect's office, and performing draughtsman's work as an expeditious mode of conveying his views and

instructions to the architect. This gentleman was one of the most accomplished medical superintendents of the day, but ultimately is said to have become a remarkable example of the fact that continued and close contact with the insane is an occasional source of absolute danger to the mental powers of the sane, and suggests the advisability of an architect so arranging his plans that the apartments for the officers when off duty shall be so disposed as not to be within sight or hearing of the patients.

CHAPTER II.

IN no class of building can an architect make himself more felt as a lasting benefactor to the occupants than in a lunatic asylum, and, in order that he may be armed with every probability of success in arranging his plans, he must to some extent study the ways and mode of life of those for whom he provides. It is most desirable, therefore, that he should have an intimate knowledge of the position of the medical superintendent, for this very knowledge must influence his ideas in the planning of the buildings.

Architects who will not endeavour to bring their asylum plans into conformity with the desires of an experienced medical superintendent are likely to regret their omissions before the end of the work ; but of course, in absolute architectural matters the architect should take precedence.

A modern county asylum has been in some respects compared to a general infirmary ; the differences, however, are more noticeable upon an internal than an external view. With regard to the patients in hospitals, most of these are in bed both by day and night ; but in asylums the majority are employed or distributed about the day-rooms, &c, during the daytime. An infirmary does not require many single-

bedded rooms, while in an asylum—according to some authorities—at least one-fourth of the patients should be accommodated in rooms having only one bed. These conditions render the designing of an asylum a very much more complicated work than for a hospital.

Many of the county and private asylums of this country are situated in finely laid out grounds or parks, and the luxurious arrangements, comforts, and pleasures which are provided for the pauper-patients are often in very striking contrast with the surroundings of their sane relatives, many of whom may be living a miserable existence, the result perhaps of the former drunkenness, vice, and improvidence of an asylum inmate.

The housing of the pauper-insane has hitherto been more costly, in proportion, than for any other section of the poorer class. The cost of the land (of which, at least, 100 acres are requisite for an asylum for 1,000 patients) is the first serious item, and its selection is a difficult matter. Suitable sites are somewhat difficult to meet with, as the requirements are so varied. The situation should be elevated with regard to the adjacent district generally, with cheerful adjuncts and should not be at an unreasonable distance from the abode of the population from whom its inmates are collected, particularly with a view to the visits of patients' friends and the supply of fuel and provisions, &c.

The water supply and sewage farming questions

are also to be considered, prior to the selection of a suitable locality for the buildings. It has been suggested that future asylums shall be limited to accommodate not more than 1,000 patients each, upon the ground that it seems impossible that one medical superintendent should know all the idiosyncrasies, &c., of so large a number of patients as are often placed in his charge.

For kindred reasons it also appears that the periodical enlargement of existing asylums is objectionable. Not infrequently additional day-rooms and dormitories have been added without a corresponding addition to the administration buildings, which latter have, in consequence, become utterly inadequate for the service. Further than this, overgrown asylums have long since been proved to be disproportionately costly, through the waste and loss occasioned by the multiplication of servants, and the difficulty of subjecting them to the individual and constant oversight of a single responsible head.

The resident medical officer is the chief officer in all asylums. We will therefore consider, in the first place, what are the best arrangements that can be made in designing and locating his residence in relation to the asylum buildings generally. His residence should undoubtedly be as nearly central as possible, that he may be equi-distant from all parts of the institution; the nearer that he can be situated to the infirmary wards the better, for it is in these that his duties are most extensively exercised, and as the

medical officer is compelled at all times and in all weathers to visit the asylum, his house should be connected with the main building by a covered and inclosed corridor, which might be heated, together with other portions of the buildings, from the general heating system of the asylum.

The medical superintendent's house should contain a large dining-room, a drawing-room, a morning or smoking-room, also a room set aside for official work in the form of a combined study and office (unless such a room be provided for near to the board room or other offices). In addition to the usual kitchens and offices, there should be about seven or eight bedrooms, a good hall and staircase, bathroom, &c.; but the extent of this residence naturally depends upon the actual stipend of the occupant, who, in addition to having his house rent free, has also frequently coals, gas or electric light, milk, vegetables, &c., gratuitously supplied from the asylum stores.

In arranging the plan of the doctor's house, and in choosing the locality for the site, care should be observed that no private-room windows or garden ground overlook the airing-courts to be used by the patients in the institution. The scenes there are not desirable for the continued inspection of a private family.

It might be convenient to place a cloakroom and lavatory, etc., in connection with the corridor, passage, or covered way leading from the asylum building to the medical superintendent's residence; the doctor

would then be enabled to change his clothing, or perform his ablutions, after leaving patients or fever wards, etc., before entering his home.

The addition of a good conservatory (from which flowers and plants for the use, not only of the medical officer's family, but perhaps also for the sick and other wards of the asylum) is an item of importance. Cheerfulness and brightness contribute so much towards relieving patients of their various ailments, that flowers should, when possible, be plentifully supplied.

The assistant medical officer's apartments should usually be placed near to the centre of the asylum, but in such a position that due privacy may be secured. The rooms should be well separated from the lodgings appropriated to the use of the nurses, matron, and other female officials; special water-closets, lavatories, and bathrooms must be provided for their use. If funds permit (and certainly in large asylums) the architect should contrive to arrange for a smoking-room, or smoking-room and billiard-room combined, for the use of the medical and other superior officers, etc. (Billiard and clubrooms for subordinate officers and patients being, of course, a separate arrangement).

Occasionally a detached residence is provided for the first assistant medical officer, whose salary being frequently about £250 (in addition to which there are allowances), is not adequate for the support of more than a moderate house, which must be arranged by the architect upon a suitable scale accordingly. The

salaries of the junior assistant vary from £100 to £250 with or without board, lodging, washing etc., and the private sitting-rooms, mess-rooms, etc., differ much in various asylums.

Detached or semi-detached houses or apartments will usually be provided for the steward, chaplain, clerk to the asylum, engineer, matron, laundry matron, head gardener, and a certain number of married attendants. These must all, of course, be proportioned in size and style to the emoluments of the officials who would occupy them. As a rule, however, the chaplain, clerk, and steward would require fairly good residences and probably a garden attached.

A very large number of officials are employed in asylums; amongst others are the assistant matron, work mistresses and masters, inspectors, day and night nurses and attendants, porters, messmen, gate porters, cooks, bakers, tailors, shoemakers, and many others who should be lodged within or near to the administrative buildings, care being always observed to separate these as to the sexes and also to some extent as to grade.

Large asylum buildings require continual attention in decorative and structural matters, and there is a necessity to maintain a staff of carpenters, bricklayers, painters, plumbers, etc., to keep the asylum in repair; these are seldom lodged in the asylum (unless as labour masters), are paid by the day or week, and provide their own lodgings away from the institution.

Other particulars of the construction and arrangement of apartments (in the patients' wards) specially intended for the use of asylum officials will be given in connection with each ward or block of building, together with some details as to the routine of duties carried out therein.

That the architect may be able to plan an asylum well, it is absolutely necessary that he should have considerable information as to the duties and dangers to be apprehended by asylum officials, and respecting the numerous classes of the insane. Some of the latter require much more warmth than others, and in the most simple matters require the closest attention from the nurses; while others are well able, and willing, not only to work and assist the nurses, but also to produce profitable returns to the asylum. Many patients are very cleanly, and capable of attending to themselves in most things; but these are in the minority. There are dirty cases (requiring bathing several times daily), dangerous and dirty cases, noisy cases and quiet ones, and patients of all these descriptions with a variety of complications of bodily and mental defects, aged and young of both sexes, and of all dispositions. The problem for the architect is the provision of accommodation where the various classes may be suitably lodged and cared for, with so much or little contact with one another, as circumstances may require.

The board or committee room should, as a rule be placed near the chief entrance to the asylum; the

dimensions, of course, depend upon the numbers of the committee and visitors. A convenient arrangement is to place a waiting room and the asylum clerk's room *en suite*, with two doors in the board room. Near to these may be the medical superintendent's business room, any additional clerk's rooms that the size of the asylum may require, a room for the hall porter, and separate lavatory and w.c. accommodation for the committee and visitors ; a strong room (or, at least, a large safe) should be provided in the asylum clerk's room.

The area of the visiting rooms for patients' friends must be proportioned to the size of the asylum, and in large asylums there should be two rooms for this purpose, for males and females, each with two entrances where practicable. These visiting rooms may be either a portion of the board room block or of the dining room department ; but in either case it might sometimes be well to so plan them that they may be used as ante rooms, etc., in connection with the dining and entertainment hall.

It is occasionally convenient to place *within the board room block* the private sitting and bedrooms of the assistant medical officers and other male officials of a higher grade, and upon one floor above, similar apartments for the matron, assistant matron, head nurse, etc., in each case providing the necessary w.c., bath, and lavatory accommodation. The board-room block is also occasionally a suitable position for the dispensary and drug store, and sometimes for the library or libraries, and the chaplain's room.

The medical superintendent's house may be near to the board-room block *when* both occupy, as they should, a central position with regard to the patients' buildings for males and females respectively, and it should be arranged that the roads leading to the portions now being described should not be very near to the patients' buildings or airing courts, for these approaches would often be used by the patients' friends and the public generally, who might annoy, or be annoyed by, the patients, or open up communications with each other contrary to discipline, etc. Some patients try to give the attendants all the annoyance and work they can, and bring absolutely unfounded charges of bad treatment against them, thus distressing their visiting relatives and friends, and creating at the same time ill-feeling against the officials of the asylum.

CHAPTER III.

THE Commissioners in Lunacy suggest that generally the approach and public entrance to the asylum should be from the north side, and the principal entrance, the porter's room, the reception and visitors' rooms, the committee or board-room, the clerks' and other offices, etc., would then be on the north side of the building; but it is frequently placed on the centre of the south front, and there is much to be said in favour of the latter position, which has been adopted by leading asylum architects in recent planning.

The dining-hall is usually the largest and most important room in the asylum, being often used also as a theatre, concert, and entertainment room. It is in this room that great opportunities for watching the patients exist, and it should be cheerful, comfortable, and well lighted. Each nurse should have charge of a fixed number of patients—or say of one table—thus having the opportunity of becoming familiar with their peculiarities and conduct. The arrangement of the tables and seats is one for the architect to consider, and with due regard to the position of the serving-rooms and kitchens, for food should be served to the patients as quickly as possible, so that it may not become cold.

As a rule the theatricals and concerts, etc., are left to the staff, only a few patients being capable of assisting; but medical authorities endeavour to draw the latter in as far as possible, getting them to sing, recite, or play, etc., the entertainments being regarded as curative agents. An eminent authority wrote: "Let us by all means try to give the patients something to think about; to occupy their minds to the exclusion of their individual worries. If only for a couple of hours of an evening we can make them forget that they are confined within the walls of an asylum, our time and trouble will not have been thrown away."

The stage, with dressing-rooms, closets, etc., need not be raised more than 2ft. 6in. to 3ft. (at the footlights) above the general floor level, with the view partly of preventing danger to the patients through falling over. There should be a fireproof curtain and all the usual precautions in the event of fire.

Between the dining-hall and the kitchen there should be planned a serving-room and washing-up room, each with doors leading both to the kitchen and dining-hall, with the usual fittings, and water services, etc.

The doorways leading to both kitchens and dining-hall should be so arranged that the sexes shall have separate approaches.

The asylum kitchen for large institutions should be 18ft. or 20ft. in height, with top lantern lights and louvred ventilators for taking away steam, heat, and

odours of cooking. The floor area should be so arranged that there may be sufficient room around and about the fittings and ranges, etc. There should be an ample supply of slate shelving, dressers, potato bins and washers, vegetable boilers, vegetable steaming chests, vegetable washers, boiling pans, gas roasting ovens, hot-plates, tables, tea apparatus, hot closets and carving-tables, warrenisers, and all the modern appliances for cooking for a large number of persons. Some of these may be placed in the vegetable scullery, which should generally be a separate apartment, and an addition to a large scullery for cleansing purposes fitted with hot water.

In many asylums the cooking is done by steam and gas apparatus; but a roasting coal-range should also be provided.

The kitchen offices should include a small room for the cook, pantries, larders, fresh meat store, dairy, and living-rooms for the servants' use, also lavatory and w.c. accommodation. The servants' bedrooms might either be upon an upper floor of the kitchen block, or be arranged amongst or near to those for the nurses or attendants. A few patients are in some asylums specially associated with the kitchen department, and may occupy bedrooms or a dormitory near to those occupied by the servants.

The stores required for large asylums are very considerable, and the areas and cubical spaces required for this department are probably much more extensive than the majority of architects, who have not carried

out such works, might anticipate. A portion of the provisions is procured by the labour of the patients from the gardens and fields attached to the asylum, and in the workshops much of the clothing, bedding, and other material is manufactured. For all this, and for the raw materials suitable storage-rooms must be provided in a central position, the approaches thereto being arranged as far as possible with a view of avoiding intrusion with the airing-courts and wards for patients.

The arrangement of the various receptacles for all stores should facilitate the immediate delivery of everything required, and with full attention as to requisite moisture or dryness, heat or cold, and other conditions.

In some asylums the general store-room is provided with a gallery on all sides, and a lantern light in the roof serving for the whole; the advantage of this arrangement is that there is a sufficiency of wall space for shelves, hanging boards, chests, or other receptacles which would occupy the wall space otherwise taken by windows.

On the ground floor a fair amount of counter space must be provided, and the approaches to the points where the stores are served out should be so arranged that the sexes shall be separated.

The storekeepers must have sufficient space also for the reception, delivery, and weighing-out of the stores. If the coal stores are placed near to the general store-room, there should be a weigh-bridge with a capacity

up to about eight or ten tons, according to the size of the asylum, or its distance from the sources of supply. Some asylums keep steam and house coal sufficient for some months' consumption, a necessary precaution in districts remote from collieries.

In arranging the plans of a large asylum, it frequently occurs that the positions of the laundry and the general stores clash, and are somewhat difficult to contrive satisfactorily; but it is highly necessary to so place the laundry and wash-houses that the persons conveying the clothes to or from the male and female sides of the asylum shall not come into contact, and it is further desirable that separate receiving and delivering rooms shall be provided for each sex. The laundry, therefore, should occupy quite a central position at the rear, and not be placed entirely on the side of the asylum allotted to females, as is sometimes done.

The laundry must be provided with a large wash-house, supplied with liberal arrangements for the utilisation of *manual* labour without very much machinery, for this work is very useful as a means of occupation for many patients, and any machinery provided must certainly be guarded from the patients in every possible way. For this purpose the engine shafts might be *below* the laundry floor, the driving belts being connected from these to the machines above.

The very foul linen would be first taken to a separate receiving-room, and thence, if necessary, passed through a disinfecting apparatus into the "foul wash-

house," which would be fitted up with soaking tanks and steeping pits, with washing-troughs, strainer, and rinser, and, perhaps, a washing machine. Having been first cleansed here, the linen would be passed into the general wash-house, which would probably be fitted with hydro-extractors, washing-tanks, strainers and rinsers, hand-power washing-machines, soaking and liquor tanks, and other appliances.

The wash-house buildings generally must be provided with ample means for ventilation and clearing away of steam, etc., from the various apartments, and the hot-water cisterns should be placed in convenient positions for examination and repair when necessary. The working rooms should be well lighted and arranged with the view of giving the officials every opportunity of inspecting the patients at their work. The floor of the wash-house should be of cement, with drain channels, etc.; the drying closets may be very conveniently placed between the wash-houses and the ironing-rooms. In a large asylum these must be of great capacity, as it would be insufficient to trust much to drying-grounds, although these must also be provided.

The ironing-rooms must be fitted with calenders ironing-boards, tables, ironing-stoves, and mangles, etc.; the floors of these portions may be of wood, or wood-blocks if preferred. In connection with this branch of the work there must be a delivery-room, fitted with racks and tables for sorting the clean linen, and for its distribution to the various parts of the asylum.

The laundry and wash-houses for the nurses and other officials would be similar to that for the patients, upon a suitably reduced scale. Separate receiving and delivering-rooms would be provided only in the event of the asylum being a very large one; but there should usually be at least two rooms for washing and ironing, and a separate small system of drying-closets.

In arranging all baths for patients it is necessary to provide a space on each side, so that attendants may be able to assist or control a patient upon one or both sides—a necessity in the cases of both weakly and violent lunatics. Sufficient water-closet and lavatory accommodation must be provided near to all laundries and bath-houses.

The buildings containing the boilers and engines should be in proximity to the kitchens, laundry, bath-houses, and heating and ventilating plant, and at such a distance from the parts occupied by patients as not to cause them disturbance, noise, or annoyance.

The boiler-house should be arranged with space for a spare boiler or boilers to meet the requirements of possible future extensions or of any breaks-down that may occur. Ample space must be provided in front for the removal and repair of the boilers, and for cleansing, stoking, and general management.

In the engine-room space must also be provided about the engines and pumps for free access to all parts. In asylums where electric lighting is used, the dynamos may conveniently be placed in the engine-room, as thereby an economical arrangement may be

obtained, and one man may easily manage engines and a limited number of dynamos; but the engine-rooms must be well lighted both by day and night, and there should be in connection therewith an office or room for the engineer, a fitter's shop and store. If a steam fire pump be provided it may be placed either in the boiler or the engine-house, with a notice-board directing the officials generally (in the absence of firemen or engineer) as to the manner in which it may be brought into action.

For illustration, we will assume that the boiler and engine power are required for an asylum of 1,600 patients, and that it is necessary to provide power for driving the laundry machinery, the ventilating fans, the pumps for water supply, the hot water mains for the baths and lavatories throughout the buildings—some of which would be at considerable distances; for a supply of steam for the coils and heating-pipes and ventilating extractor coils in the roof or elsewhere; also the power for an ample supply of steam and hot water for kitchen and scullery purposes. For such purposes it has been found necessary to provide ten high-class steel single-tube Cornish boilers, each about 25ft. by 6ft., and with all the usual fittings and double-action donkey-pumps, capable of feeding the boilers at the rate of about 5,500 gallons of water per hour. There would also be required engine-power to the extent of, say, about, 30-horse, and the fire-pumps before mentioned.

For an asylum of 1,600 patients the approximate

cost for these works and materials would be not less than £8,000 ; but this item would be, of course, influenced by local considerations and the available means of transport. For a further sum of about £3,000 the whole of the buildings might be heated from the boilers by means of steam-supply. The waste from the steam-traps might be carried by means of wrought-iron pipes to an underground reservoir, and the water thus saved made available for feeding the boilers or for laundry purposes.

For an asylum of 1,600 patients, a tank to contain at least 150,000 gallons of water should be provided, either upon water-towers above one of the buildings, or in other suitable positions (a tank 50ft. by 60ft. by 8ft., or of equal capacity). This would (tank and contents) exceed 800 tons in weight.

In an asylum for 1,600 patients there would be required somewhat extensive provision in the event of fire. Say, two dozen 3-in. gun-metal hydrants placed in suitable and conspicuous positions *within* the buildings, and there might probably be double that number fitted about the grounds ; but in arranging for the positions of these, the architect would probably do well to consult a fire-brigade or other specialist. All the hydrants should be provided with lengths of good hose, and with provision for all other appliances for maintaining or bringing the apparatus into action. Near these should be means for filling the fire-buckets and nozzels for smaller hose.

These hydrants should be connected with the high-

pressure constant supply main, if available, of the water company of the district where the asylum is situated; but as such a supply is frequently not attainable, it will be observed how necessary it is that a tank, or other means of supply, should be well elevated, so as to obtain a sufficient force of water. If, therefore, the source of water is other than from the constant supply of a company (but brought to a suitable point on the site), a 4-in. sluice valve and cover should be provided with a 4-in. main to the tank, and be connected with the same by a rising main fitted with a flange ball-valve, and the main of the same size should be connected with the steam fire-pump; but the fire mains to the various blocks may be reduced to 3-in. or less provided an ample *force* of water is always obtainable in sufficient quantity.

All the fittings for the hydrants and all the appliances connected in any way with fire extinction, should be kept on boards or racks near to the hydrants, and spare materials and appliances should be kept in glazed cupboards (but protected from injury by the patients).

A suitable number of fire-buckets should be dispersed about the buildings, always three-parts filled with water and hung within reach. Approximately, the cost of the hydrants and fire-extinction appliances as above mentioned (for an asylum for 1,600 patients) would not be less than £2,000; while the cost for the hot and cold water supply, with all necessary cisterns, tanks, water-waste preventing apparatus, water-closets,

lavatories, baths, slop-sinks, scullery-sinks, urinals, pail services, etc., would be in an asylum of this capacity not less than £7,000.

The various blocks of buildings should be supplied with auxiliary water-storage, giving a separate temporary supply in cisterns containing, say 1,000 gallons each. The contents of each of the hot-water cisterns may be about 200 gallons, and these might, if convenient, be heated with steam coils.

In connection with the foregoing items, it may be remarked that 1,600 patients would require, say 600 lavatory basins, 130 baths, 320 water-closets, a large number of slop-sinks, etc., and a urinal for each ten patients.

An asylum for 1,600 patients would probably cost (under present methods) for electric lighting about £12,000, including wiring and supplying fittings for about 3,000 lights, engines, shafting, about eight dynamos and accumulators to give currents for 2,000 lamps for five or six hours, etc. (The boiler power would be included with the boilers first named.)

CHAPTER IV.

IN mental diseases suitably regulated degrees of activity and rest are amongst the most important means of treatment. So long as a patient is employed upon matters unconnected with his malady, he may be said to be in a great measure free from it, and by abstracting his attention from the insane ideas, these are more readily dispersed or weakened. A steady employment of the patient, especially when voluntary, is considered to be a decided indication of improvement, and is frequently the commencement of recovery. Those employments are best which keep the patient engaged in the open air, as in garden and field labour. These prove of great advantage, not only to the lower ranks who have been accustomed to daily toils, but also to the educated classes. Where the condition of the patient renders this impossible, household or mechanical modes of employment, chiefly of a light kind, are usually substituted. In chronic cases the learning of a new and agreeable trade will sometimes be most beneficial in interesting the attention. "Indigent patients should receive a small remuneration for their work during recovery. This might often prove a seasonable protection against want, and while the patients are to be restrained from unsettled trials of a variety of employments, every

appearance of a manufactory, or regard merely to the pecuniary advantage of the institution is still more to be avoided—recovery of the patient should be the chief object of the work.”

In the five asylums for the county of London the patients in 1893 were thus divided:—

MALES.

Total employed	...	...	...	...	2,270
Unemployed	...	...	...	...	864
Sick, old, or infirm	...	...	...	...	916
Absent on trial	...	...	...	...	9
					<hr/>
Total in Asylums	...	...	...	...	<u>4,059</u>

FEMALES.

Total employed	...	...	...	...	3,113
Unemployed	...	...	...	...	1,889
Sick, old, or infirm	...	...	...	...	1,107
Absent on trial	...	...	...	...	12
					<hr/>
Total in Asylums	...	...	...	...	<u>6,121</u>

The above figures would probably give the minimum proportion of employed patients, as one of the asylums having only recently been opened, the workrooms and means of employment were not fully organized.

For male patients the upholsterers' shop must usually be of the greatest area; but rooms of ample size should be provided for the tailors, bootmakers, painters, tinworkers, wood-choppers, etc., and all these must have

sufficient lavatory and w.c. accommodation, and store-rooms for raw and manufactured materials, tools, and implements.

For the female patients the work is simply sewing and mattress labour, and the domestic duties in the laundry, kitchen, and wards.

The workrooms should be well lighted, and with, if possible, good prospects from the windows; there should, usually, be at least two doors to each work-room. The farm buildings also should provide means for a considerable amount of labour.

In an asylum (for about 2,000 patients) near London, the farm buildings provided accommodation for 8 horses, 40 cows, 1 donkey, 2 bulls, 11 heifers, 3 calves, 214 pigs, 224 fowls, 10 ducks, and milk, eggs, vegetables, and fruit are provided for the use of officials and patients in considerable quantities. The arable and pasture lands attached to the asylum in this case are less than 100 acres in extent, and the *buildings* would seldom have to be more than sufficient for such purposes as above indicated, although a large number of patients are employed upon the lands, orchards, gardens, grounds, roads, etc., generally.

The mortuary should be placed at some distance from the view of the asylum inmates and in connection with it the post-mortem room and pathological laboratory may be arranged. The junior medical officer of the asylum often makes the post-mortem examinations, but a special pathologist for a *number* of asylums has in one district been appointed, and an

expenditure authorized of £4,000 for the erection of a pathological laboratory and museum for his use.

To a great extent, the clinical and other work of the medical officers, the absence of suitable laboratory accommodation, and other causes have prevented exhaustive research; but it appears to be generally requisite that full means for the purpose should be provided in all large asylums.

It might in special cases be convenient to add a jury and waiting-room, with lavatory and w.c. accommodation, etc., a room for a bier, and other exceptional provision.

The pathological specimens are sometimes sent to the medical schools, but some authorities consider it desirable that these should be retained in the asylum museum.

In the great asylums for London, the obvious difficulties of providing for the various kinds of religious ministrations are less than in the provinces, and are, as regards one sect, met by forwarding Jewish patients to the Colney Hatch Asylum, where they are now in sufficient numbers to warrant the appointment of a special minister.

Catholic patients are also attended in various asylums by specially-appointed priests, with or without special chapels, in this country. In Ireland, however, in the large asylums, two chapels are often provided. Religious instruction is not usually withheld from any patient who desires and requires it; it would, however, be against the first principles of

mental treatment to enforce such instruction. All efforts in this direction should direct attention from morbid representations, restoring healthful modes of thought. How far such ends should be attempted by these means is a question for the medical superintendent.

A well-appointed chapel must be provided near to, or adjoining, all asylums for the use of attendants and patients. The arrangement should correspond generally with ordinary buildings of the class, but there should be added two rooms for those males and females who may be taken with fits during service, to which they can be instantly removed from the chapel.

The Commissioners in lunacy suggest that the chapel shall be sufficiently capacious to meet the prospective wants of the asylum in case of an increase in the number of patients. It should generally be a detached building, easy of access, and capable of comfortably accommodating at least three-fourths of the patients, with separate entrances for the sexes.

There should be one or more libraries, over which the chaplain would probably have some control, and a business room for this official might be placed *en suite*.

Billiard and club-rooms are often provided for the patients and officials, the higher officials having sometimes one of the former for their exclusive use. A music and a band practising room are also sometimes arranged for. The position and size of these depend upon the general arrangement of the asylum; but they should not be situated so as to cause disturbance to sick patients or those requiring quiet and rest.

The foregoing comprise the chief portions of the administrative departments. With regard to these and the buildings for patients, to be next described, the following extract is equally applicable :—

“A leading principle in the erection and whole internal arrangements, which has certainly been too often overlooked, is that all the household arrangements of an asylum should, so far as is consistent with its peculiar design, resemble those of a large private dwelling-house—that they should differ as little as possible from the houses and furnishings of the sane. On this principle all plans are objectionable which, by attractive peculiarities of architecture, such as steeples, turrets, etc., insinuate, even by their external appearance, that they are intended for some peculiar purpose. All prison-like cells on the one hand, and on the other undue magnificence in lofty halls, colonnades, etc., must, on the same principle, be avoided. It should throughout have the appearance of a medical institution, whose express aim is the restoration of health ; it should convey the idea of ease, comfort, stability ; it should also be cheerful and pleasant, with a scrupulous regard to cleanliness, which in such institutions should always be assiduously and perseveringly insisted upon.”

One of the leading conditions of success in the treatment of the insane is the sufficient separation of curable and incurable patients, for it is obvious that a close association of patients with very bad types of mental incapacity would delay or prejudice

the possibilities of cure of those of whom there may be reasonable hopes of recovery.

It has long been recognised that the organisation of asylum-homes for incurables should be very different from hospitals for the management of recent and curable patients.

CHAPTER V.

IN the earlier attempts to reform the asylum system, new asylums were erected for the supposed curable cases, and the old institutions (which had been found, even then, wholly insufficient for the therapeutics of the day) were, with some alterations, converted into asylums for incurables. At the present time, however, all the various classes of the insane are usually to be found in one institution. Perhaps one of the reasons for this is the fact that the boundary between curability and incurability is very undefined; further, the transference of patients from a curable to a chronic asylum is said to have been not only inconvenient, but expensive.

On the other hand, it is not desirable that an asylum for chronic patients should be considered too strictly as being for those whose malady is hopeless; the wards must be fitted up and designed for the reception of old or chronic cases, who (though not frequently) may yet be occasionally relieved or even wholly cured. There is the further consideration that physicians might to some extent neglect the supposed incurables in the greater attraction offered by curable cases.

The chronic wards of an asylum must, therefore, be large in proportion to those for other classes, and it is to these that the management must be able to promptly

dismiss all found to be (probably) past all cure, but only after every possible effort has been made to prevent the disease from assuming a chronic type.

In arranging the plans of chronic wards, and those for working and quiet patients, the words of an eminent physician may be usefully borne in recollection: "Of moral remedies, proper employment of the patient seems to us the most important. In healthy work the innate desire of expressing and giving vent to its energies finds fullest satisfaction; by constant occupation in forming materials, the thoughts and efforts engross the mind and withdraw it from the empty longings and illusions of the imagination; the feeling of success again prepares the way for expansive sensations, and therewith self-esteem and confidence return. Therefore a steady employment of the patient, especially when voluntary, is rightly considered a decided indication of improvement, and is frequently the commencement of recovery."

The buildings for the working patients should be of a simple character, consisting chiefly of associated day-rooms and dormitories; these must be placed in connection with the wash house and the laundry, and the sewing-rooms on the female side, and conveniently situated in reference to the workshops and farm buildings on the male side. These buildings may wholly or in part be of three stories; but the Commissioners in Lunacy require (or at all events suggest) that the uppermost story be devoted to associated sleeping accommodation for quiet cases, and

that, as far as possible, each ward shall contain sufficient sleeping accommodation for all the patients for whom it is designed. As female patients usually preponderate, the plan should provide more accommodation for that sex than for males, and should be so designed as readily to admit of extension on either side. No ward should be arranged for a less number of patients than would, as a rule, require the services of more than one attendant.

County asylums occasionally afford some accommodation for paying patients, generally in detached wards or blocks within the precincts of the institution ; but as the buildings are chiefly for the reception of pauper lunatics, all superfluous decoration should be avoided, both in the exterior and interior of the building, which, however, should be rendered as cheerful and attractive as due considerations of economy will permit.

In all county asylums it is necessary that there should be arranged for each class of patients a small ward in which newly-admitted patients may be placed under special observation, and in all asylums dormitories, with a sufficient number of single rooms communicating, should be set apart and arranged for the care and supervision, during the night, by special night attendants of those patients requiring special treatment or care.

The Commissioners in Lunacy do not require that the proportion of single rooms throughout the asylum shall exceed accommodation for more than one-fourth

of the patients. These would be chiefly in the wards for the excited and sick ; but a few should be provided for special cases in the chronic wards, as well as for epileptics, etc. No *associated* bedrooms should be arranged for less than three beds, and the general height of each story should not be less than, but need not be more than, 12 ft.

For clean and healthy patients the associated dormitories should provide a floor-space of not less than 50 ft. superficial to each bed or patient, and the single ones not less than 63 superficial feet. These are the suggestions of the Commissioners in Lunacy, who, however, state that "the space in the dormitories and single rooms of infirmary wards should be one-third greater than these dimensions. Doors of communication between two single rooms are found useful in a few special cases."

The day-rooms for chronic patients, of which there must be one attached to each ward should provide for not less than 40 ft. superficial for each patient, not including corridors of less width than 10 ft. Where corridors of that or any greater width exist, the day-rooms may afford only 20 ft. superficial for each patient, it being understood that a space equal to 40 superficial feet be provided for each patient in the day-rooms and such corridors combined. The day-rooms should be so arranged as to afford ready communication with the grounds and airing-courts, and suitably near to water-closet and lavatory accommodation. Whenever practicable, the bedrooms (for two or more

attendants to each ward) should be placed *between* two associated dormitories, with glazed doors of communication with *each*; single attendant's rooms must have an area of not less than 100ft. superficial, while larger rooms are sometimes provided in some of the male wards for the use of married men and their wives.

The windows of the day-rooms and corridors should be large (with small panes, so as to reduce the cost of repairs occasioned by destructive patients) and not more than 3 ft. 6 in. from the floor. They should have wood sashes, double-hung, and be made to open easily so as to allow a free circulation of air, but so arranged as not to expose the patients to danger. The wall below the sills of windows in dormitories may be splayed, but in day-rooms and corridors may be recessed to admit of a seat, if desirable. In the dormitories and single rooms the windows should, as a rule, not be placed more than 4 ft. from the floor; but in padded rooms the windows should be placed as high as possible, and when practicable, perhaps skylights would be desirable. The windows in all parts occupied by patients may be stopped so as to allow of being opened top and bottom 5 in.

Many of the single rooms should be provided with strong, solid shutters, so constructed as not to admit of being forced open, or to afford opportunities of committing suicide by hanging.

The single-room doors should in all cases open outwards, and be arranged so that they may fold back close to the wall. Some of the doors should have an

open panel 5 in. wide in the centre of the door above the middle rail.

There should be a very ample arrangement of lavatory conveniences ; these should be placed in the annexe for water-closets, slop-sinks, etc. It is most desirable that all water-closets, lavatories, etc., should be placed in these projecting buildings, with a lobby about 5 ft. wide, with cross ventilation separating the wards from the water-closets.

Each ward should also be provided with one or more bath-rooms, either in the ward annexe or in a special room for the purpose, as it is often convenient to make use of these rather than take some patients to the general bath-house, before described. For these baths, the same rule must be observed of providing sufficient space for two attendants, one on each side of the patient, who, it must be remembered, may be either too weakly to assist in his ablutions, or otherwise disposed to be refractory or violent. For the majority of the patients, however, a general bathroom, conveniently placed, is found most desirable for the bathing of the patients. It is of considerable importance that there should be ample means for *quickly* bringing into action the hot, cold, and waste taps. These should be of large size therefore. The arrangements should be such as to preclude any danger of scalding patients, and the taps should show when the hot and cold water is flowing.

Each ward should be provided with ample convenience for stores, clothing, bedding, crockery, and

all other things required in *that* ward, these being obtained, as a rule, from the general store-house of the asylum, as required, in moderate quantities. There should also be boot (and bonnet) rooms *near the patients' doors* leading to the grounds or airing-courts, so as to prevent the inmates from bringing in dirt from outside the building.

The staircases are so placed that there would be two exits to all the principal rooms on the upper floors, and on both floors the arrangements are such as to entirely shut off a ward for any special purposes that may be required, and the occupants of any section may easily gain access to the airing-courts and gardens without intruding upon adjoining day-rooms or dormitories. In arranging a plan of this kind the day-rooms should be well lighted rather than the dormitories, the reverse being sometimes admissible for wards for sick and bed-ridden patients.

The following are amongst the official regulations for corridors and staircases in asylums in this country :—

“As a *general rule*, corridors or passages ought to be no wider than necessary to connect the several parts of the building. On the upper stories corridors, and in particular wide corridors, should, so far as possible, be avoided. It would, however, be of advantage to have on each side of the building, on the ground floor, one good corridor, or two, to the south, with a large bay window ; and these corridors should not be less than 12 ft. or 14 ft. in width, the corresponding space on the upper floors being made available for dormitories.”

“The stairs should be built of stone, without winders or long straight flights. The well should be built up, and handrails should be provided on each side of the stairs.”

“The staircases should be of such number, and be so placed, that the medical officers, attendants, and others may pass through from one part to another, without unnecessarily retracing their steps, and as to afford ready egress to patients in case of fire. Every dormitory must have two exits, one at each end, and (in the case of rooms not on the ground floor) leading to separate staircases.”

“All the corridors and day and sleeping-rooms should have boarded floors, and it is desirable that the boards should be narrow and tongued. Oak floors, capable of being cleaned by dry rubbing, are preferable for the corridors and day-rooms, and for the single rooms occupied by dirty patients. Where oak is not used it is indispensable that the boards should be of the best yellow deal, of narrow width, and thoroughly well-seasoned. At each end of the corridor the continuity of the timber floor should be broken by fireproof construction, so as to prevent the spread of fire beyond the corridor in which it may occur. The floors of the sculleries, lavatories, urinals, and water-closets should be of cement or tiles. Wherever practical, horizontal and lateral fireproof construction is adopted. The ceilings next below the roof in all parts of the asylum occupied by patients should be constructed throughout of incombustible materials. Hydrants connected with the cisterns in the roof (or,

which is preferable, in a water-tower of considerable height) should be placed in convenient positions on all floors, and an external main provided, by which water could be thrown over the building. The walls of the galleries and rooms generally should be plastered or cemented, unless lined with pressed bricks. Dados of pitch-pine may with advantage be used in day-rooms and corridors."

The attendants' rooms are generally arranged so that the officials may have views of two apartments by glazed doors or windows communicating with each.

The boot-room is arranged in a position so that persons coming from the airing-courts and gardens, etc., may not tread dirt in through to the corridors. The annexes, with water-closets, etc., are placed so that they may be approached from the day-rooms and dormitories, without any disturbance of the patients of other wards either by day or night. These annexes should also provide for a bath and some additional lavatory accommodation beyond what is elsewhere arranged for, and there should also be a slop-sink included.

In arranging the plans of water-closets, passages, staircases, etc., it is well to bear in mind that many of the patients require to be constantly in view of an attendant for a variety of reasons; therefore there should be as few opportunities for concealment as practicable—no recesses or dark corners. All day-rooms and dormitories must have entrances at each end, that there may be means of escape during panic or fire, or other occasion, during excitement of a dangerous patient, etc.

Two head attendants—a male and a female—should take charge of the lower staff. Only persons of considerable bodily strength should be engaged as attendants. They should also be intelligent and good-natured. Each attendant is generally intrusted with not more than 10 patients; but some patients require the entire services of an attendant.

It is difficult to provide for all that is necessary for the advantage of the patients unless the buildings for their occupation are very carefully planned, and in order that the arrangements in connection with an asylum may go on with order and without confusion, there is always a written set of rules for the guidance of the officials. The precise duties of each servant are definitely stated. The discipline of an asylum should be stringent, and all the operations so conducted that everyone, whether healthy or insane, who visits or resides in the establishment may be impressed with the idea that it is conducted on rational principles; a sense of tranquility and ease should pervade the whole, and the desire for activity on the part of the patients, which precedes and accompanies every case of recovery, should be quietly and moderately indulged. Every gloomy, ascetic, barrack-like idea should be avoided, and the great object should be to diffuse a spirit of cheerfulness. To attain full success, therefore, the officials must be provided with apartments arranged by an architect who shall have acquired an intimate knowledge of the habits of insane patients, and the means adopted for their relief or cure.

CHAPTER VI.

IT may be noted that there have been other systems than those formed by confinement in asylums, whereby the insane have been maintained and employed. A colony of insane, for instance, was formed in the village of Gheel, in Belgium, in which (it is said for several hundreds of years) lunatics have lived together with the inhabitants, and even resided in their families. (In former times, it is stated that people frequently resorted thither to supplicate the aid of Dymphne, the patron saint for the insane). Here the lunatics enjoyed an amount of pleasure and freedom which could never be permitted them in an asylum. Owing to the peculiar position of Gheel, escape by the patients would be difficult; it is enclosed by moors, and is at a distance of many miles from other villages. With all its advantages, it is said to have had undoubted drawbacks; but the arrangements at Gheel proved that the greater number of insane do not require the confinement of an asylum, that many of them can safely be trusted with more liberty than these institutions allow; hence there is further evidence of the desirability of architects planning asylums which shall be hospital homes rather than prisons.

The case of Gheel suggests the question whether similiar colonies might not be established in other places—say in one of the poverty-stricken country districts of Essex or other counties, where the land is falling out of cultivation ; some suitable spot might be found and the evils resulting from overcrowding of lunatic asylums thereby removed. An expert stated years ago that “in England and Germany an exact imitation of Gheel has been recommended. It was proposed to assemble a number of lunatics within a village in the immediate vicinity of a Government asylum, so that it might maintain a certain relation to them. The difficulties in the way of adopting this plan, which have been collected and clearly set down, have not been yet surmounted. Still, however, I continue in the belief that the day will come when the means and method will be discovered by which the problem of a lunatic colony, and thus the question of the care and treatment of all classes of the insane, will be finally solved.”

Thus it will be observed that architects may, in course of time (for certain descriptions of the insane), be called upon to design some asylums which would be more in the nature of small villages, suitably inclosed, rather than institutions arranged as at present.

During the intervals between epileptic fits many of the patients suffer from hysteria, hypochondriacal or maniacal manifestations, and remain usually in a state of decided mental disease, are weak in memory, or have exalted ideas. Perhaps one-fifth of all epileptics

are free from intellectual derangement ; but nearly all even of these are often irritable, peculiar, and easily excited to passion. Epileptics are often suspicious, discontented, and suicidal. This is said to arise, in some cases, from a gradual perception of their terrible affliction, and an anticipation of its probable sad termination. "Memory fails, perception becomes dull ; the imagination loses its brilliancy, and the emotions become withered. The physiognomy and deportment change ; the patient thick-lipped, coarse in his features, and repulsive in his appearance. As the attacks become weaker and less frequent, the mental faculties may regain their power ; but owing to the rarity of radical cure in epilepsy, the majority of these patients fall into dementia." For such persons as these the asylum architect has in most asylums to provide some accommodation ; but the proportion of epileptics to other classes of patients varies much in the different districts from which asylums are filled. Some asylums (which are exclusively devoted to curable cases of insanity) have been closed against all insane persons who are afflicted with epilepsy.

The architect in planning the wards for male and female epileptics would first notice the considerable difference in the numbers to be provided for. For instance, there were in the London asylums on the 31st December, 1893, 4,045 male and 6,009 female patients, a total of 10,054, of whom 1,171 appeared to be epileptics (596 males and 575 females) ; therefore, although there were many more insane females, yet

there were greater numbers of *epileptic males*; but taking all classes it will, I believe, be found in most districts that there are more insane females than males. One reason for this, perhaps, is the fact that insanity is more frequently transmitted from the mother than from the father to the children. It has also been stated that when the mother was insane, more of the children became so. Further than this, in the case of daughters the disposition to insanity is inherited thrice as frequently from the mother as from the father. It follows from this, that through insanity of the mother the children generally are more endangered than through insanity of the father, and also that it is more especially the children of the female sex who inherit this unfavourable tendency. The asylum architect would occasionally be called upon to plan the wards on the male and female sides for equal numbers of patients, but more frequently for an excess of female patients, and seldom for an excess of males.

In plans for the apartments for epileptic patients, it is requisite that the attendants should have the most ample means of keeping the patients under constant observation, as the epileptic fit may occur at any time with little or no warning, and the patient fall and require instant assistance; after the fit he requires to be watched, as the attacks often follow in rapid succession. Apart from the patient's safety, the attendants and nurses require to be on the alert to prevent their charges having the opportunity of injuring themselves or others, or of committing suicide.

The single sleeping-rooms must therefore be provided with small movable panels in the doors, so that the patients can be watched occasionally during the sleep that often follows a fit. The demeanour of a patient and a knowledge of his special hallucinations often indicate (for some time in advance) to an attendant what his condition is likely to be. The architect should endeavour, as far as practicable, to avoid all steps, and so arrange all corridors, day-rooms, and dormitories, etc., that a patient shall not be out of view should he fall into a fit. Here the attendants' rooms command a view of both dormitories and day-rooms, and the single rooms are placed with direct access from the day-rooms and dormitories, thus allowing of a better means of observation than if placed off a passage or corridor.

In the wards for the sick and infirm patients the conditions vary very considerably, for the patients may be suffering from various bodily ailments, requiring many descriptions of medical and surgical treatment, in addition to the continually changing complications arising from their disordered mental condition, bodily weaknesses, or advancing years.

A frequent arrangement of the plan of a large asylum provides a somewhat central position for the buildings for the sick and infirm, the medical officer's residence being placed between the wards for the males and females.

There should be many day-rooms, so as to secure as far as possible individual observation and care. A

northern aspect must always be avoided, and there should be two or more exits to every room for use in the event of panic or fire. There should be a few bay windows; these are sometimes useful in assisting the patients to form into groups for conversation and recreative purposes. The decorations of the day-rooms should be of a very bright and cheerful description. No day-room should be for more than 40 or 50 patients (allowing not less than 40 square feet per patient), and the height should be usually from 12 ft. to 15 ft., but never less.

Special observation dormitories should never be arranged for more than twenty-five beds, but for financial reasons it is too frequently necessary to greatly increase the number.

All dormitories should have windows provided on both sides of the room, so as to secure a cross ventilation, and no dormitory should be less than 20 ft. wide, but need not be more than 21 ft. wide; this is assuming that there would be only two rows of beds—a greater number is a disadvantage. The beds should be 3 ft. apart, and are usually 6 ft. in length.

The dormitory night attendant should occupy a central position, so as to be fairly near to all patients, and should always have the patient in front of him. In arranging the position of the beds this must be carefully remembered, and a space left for the attendant's chair, preferably upon a platform slightly raised from the floor.

The buildings for the sick and infirm patients should seldom consist of more than a ground floor and one

story above. The upper floor may be arranged with day-rooms and dormitories or with day-room dormitories. The staircases leading to the upper floors must always be of fire-resisting materials, inclosed within brick walls, and with handrails on both sides. No "winders" are admissible, and the straight flights must not contain more than ten steps each. Lavatories and bathrooms, etc., would be required in an annexe continued from the floor below.

As the attendant who has the charge of an observation dormitory ought not to be allowed to leave the apartment while on duty, he should not be required to take charge of any patients in single rooms connected with his dormitory.

Some authorities consider that the single rooms should not be less than 10 ft. by 10 ft., except those used by night only, which would be 10 ft. by 6 ft. ; but for a county asylum for pauper lunatics perhaps 10 ft. by 8 ft. 6 in. for the day and night single rooms and for sick and infirm, and 10 ft. by 6 ft. for the others, would be dimensions suitable for meeting all requirements. The doors would be arranged to open outwards in all cases, and these would have in some instances padded panels to deaden the sound caused by violent or excited patients hammering against the same, and to prevent other patients being disturbed. The single-room windows would require to be fitted with shutters, hung so as to fold and *lock* back against the side wall, otherwise opportunities for suicide would be afforded by hanging cord, sheets, etc., to the top of the shutters.

These shutters must be of strong construction, not less than 1 in. in thickness. The upper half must have perforations for light and ventilation, or left open at the top for this purpose. What is required is that there shall be no *small* openings into which an actively suicidal patient could force a peg or support for any rope or material that could be used for hanging himself, nor any bars or projections which could be utilised for the same purpose. A certain number of single rooms may have double doors as additional deadeners of sound.

All doors of single rooms should have specially-made silent-action locks, indicating if locked or otherwise, and so arranged that they may be silently opened at any time by an attendant for inspection purposes, etc. For some patients, there can be no objection to an arrangement by which he may close his single-room door, and seclude himself from intrusion by other patients ; but, of course, he must not be able to bolt or *lock out his attendant*, who must *always* have keys of these rooms. For purposes of inspection there must either be an opening in the door-panel, or a narrow slit-window 3 in. wide, with splayed sides. Patients are said to object more to the door-panel openings than to the window-slits.

Padded rooms are required chiefly for the protection of those patients who are not only weak, but also excitable, and liable by accident to suffer injury ; but these small apartments are also necessary for preventing very strong and violent patients from

purposely injuring themselves or destroying their lives.

For violent cases, the height of the padding on the walls should be about 6 ft. 6 in. Even in a large asylum, not more than two of these rooms need be provided—one for the males, the other for females. Any other padded rooms that may be required should be padded to the height of 4 ft. or 5 ft. only. The padding should be about 5 in. in thickness, and as this would reduce the area of the room, the apartment must be made 10 in. wider each way. (The cost of padding a room is about £60 or more.) From the offensive habits of the class of patients confined to padded rooms, it is necessary to provide for the necessity of cleaning and disinfecting the padding, which may be of leather, canvas, or waterproof materials, etc.

There should be included in the suite of rooms of all wards a small store-room provided with shelves and racks for the various appliances required for each class of patients. This room should be conveniently placed with regard to the distribution of stores and the non-disturbance of patients. For a ward of 50 patients the local store-room should not be less than about 10 ft. by 5 ft.

Coal stores may be placed in each ward, but it would be preferable to use coal-boxes; the latter have been found to be more economical, while coal-places have been found dangerous as affording hiding recesses.

Soiled-linen closets are frequently provided in

asylums, but are not at all necessary; in fact, the clothing from the patients and all linen should be immediately sent off out of the wards to the laundry, particularly that from the wards occupied by patients of dirty habits.

Well-lighted closets for slops and brushes must always be provided; these should usually be placed in the water-closet annexe. There must be a slop-sink with cold and hot-water services. There should be a place for every article used in the cleansing of the wards and every orderly provision that can be suggested, as it is important that a good check upon the interference of patients with asylum appliances may be maintained, and it must not be forgotten that the slop and brush closet may afford patients weapons and the means of mischief to themselves and those with whom they may be associated. However insignificant some of these rooms or closets may appear, yet their improper arrangement or situation may involve fatal consequences.

Patients who are able to go out into the airing-courts, the gardens, or grounds of an asylum, and who have been working in the fields, often return (unavoidably) in a dirty or muddy condition, and it is therefore usual to provide for each ward a boot-room where they may change their boots and cleanse themselves, thereby avoiding the bringing in of dirt on the floors and staircases of the asylum. These rooms should be provided with a suitable number of lavatory basins; it is, perhaps, an advantage to

provide two doors to this room, so that the clean need not have to pass the unwashed.

The sculleries should be supplied with hot and cold water, the slop-sinks should be of glazed earthenware, and it is advisable that self-closing valves be used to prevent waste of water by patients and attendants; the sculleries should be locked from the patients when not in use, and therefore would not conveniently be placed in the annexe for closets and lavatories.

The lavatory basins should be about 2 ft. 3 in. from centre to centre, so as to allow the patients' sufficient space and avoid jostling each other. The basins should be of stoneware, say *one* basin to every *four or five patients*. These should always be arranged within a proper lavatory apartment, as the ablutions should not be performed in the dormitories. The spaces below the basins should be left open. Some lavatory basins would be provided within the w.c. annexe, others in the bath-rooms, boot-rooms, etc. For every *one hundred* patients not less than *five baths* are required. The ward bath-rooms should be placed near to the dormitories, or between the day-rooms and dormitories. The baths should be kept away from the walls, and there should be space all round the baths to enable the attendants (occasionally two of them) to assist or manage the patients. A desirable size of bath for the purpose would be 5 ft. 6 in. by 2 ft. 6 in. by 2 ft. 3 in. deep. Earthenware baths are preferable to any others. These baths are, of course, in addition to those provided in the large

general bath-houses for the male and female patients respectively.

Urinals must be provided on the male side of the asylum in the proportion of *five receptacles for each one hundred patients*. The floors and walls of urinals should be lined with glazed bricks or tiles, and the divisions be of slate or stoneware. A gutter is all that is requisite. Pans raised above the floor are unnecessary. There should be an automatic flushing system to each row of stalls, acting every few minutes.

In connection with all large asylums it is necessary to provide for the isolation of those patients who may be suffering with fevers or smallpox, etc. (acquired after or before admission to the institution). In some instances acute febrile diseases of different kinds give rise to an outbreak of insanity. The disorders which they occasion within the organism seem to be the only causes of the insanity, and after a patient is quite free from the fever, or even become convalescent, he often exhibits all kinds of perversities, erroneous ideas on various subjects, and hallucinations, but recovers frequently with improved nutrition and increased strength. But there are also severe cases of insanity which commence during convalescence from fever. There may be two classes of insane fever patients, the one being of those chronic or other lunatics who have the misfortune to be attacked with infectious diseases after admission to an asylum, and the other those persons who may become insane as

one result of an outbreak of cholera, smallpox, or fever, etc. Some of these patients become very actively suicidal, and in providing for their accommodation and care, the asylum architect will have to combine, in one building, the requirements of an isolated fever hospital and a miniature asylum, with special opportunities for observation of the patients.

For the safety of all concerned, the hospital for insane fever patients must be at a considerable distance from the chief buildings of the asylum, and so placed that the main approaches may be at a safe distance, the building itself being placed in a retired position. The nurses in charge should be housed in a building adjoining the hospital, and should not be under the necessity of intermingling with the officials or patients of the main asylum, and would therefore require to have a small separate administrative arrangement containing all that is requisite for cooking, laundry, and other work, and a disinfecting chamber and fever mortuary are also necessary as adjuncts.

There would be required in connection with an asylum for 1,000 patients a fever hospital for six or eight patients of each sex, in separate wings of the detached building, and there should be at least one or two single rooms on each side, and day or convalescent rooms for males and females. The area per patient in the dormitories and single bedrooms should never be less than 100 ft., or much more if means permit, and the cubical contents should allow from 1,500 ft. to 2,000 ft. to each inmate. The patients' buildings

should not exceed one story in height and the aspect should be to the southwards.

In connection with the fever hospital, there should certainly be a special laundry, containing a receiving-room and a washhouse of moderate size, a closet of drying-horses, and an ironing and finishing-room, together with a disinfecting-chamber, which should be placed near to the receiving-room. The whole of these rooms should be arranged at a fair distance from the fever hospital and residences for the fever nurses, so as neither to create any nuisance to the occupants, or interfere with the free circulation of pure air round the establishment.

Near to the fever laundry should also be provided a mortuary for fever cases, with a juryman's inspecting-window, arranged so that the coroner's officials and the jury may not be brought to any danger during the performance of their duties.

In very large county asylums, perhaps rather more accommodation might be given—two or three additional single rooms, a receiving-room for patients, where they would receive a preliminary examination. Patients are occasionally brought direct to an asylum in a filthy condition—dirt on the skin, matted hair, and with evidences of vermin. And a considerable number of cases of dangerous fever with extreme delirium have been introduced into asylums as cases of insanity; therefore it is most necessary that the medical officers should have every facility for conveniently examining all such patients at the earliest moment after their admission to an asylum.

As a rule, patients should be photographed, weighed, and measured when they arrive, stripped and examined, before being bathed, by the medical officers, their identifying marks, state as to cleanliness, freedom or otherwise from disease or injuries being all then duly noted and entered. They will then be assigned to a suitable ward according to their classification of insanity, unless consigned to the care of the fever nurses, or (as seldom occurs) found to be quite sane.

The desirability of providing accommodation for insane fever patients will be recognised if it be remembered that the friends and relations of the pauper patients visit the asylums in large numbers, bringing occasionally with them, possibly from poor and unclean districts, many opportunities of introducing infectious disease.

The condition of most or all county asylums in Great Britain and Ireland has been more or less favourably reported upon by inspecting officials ; but some of the lunatic wards in workhouses in Ireland, according to recent reports, appear to be kept in a filthy state and to be badly looked after. In various parts of Ireland architects have been recently called in in various places to deal with the existing want of lavatory, bathing, and other requirements, the absence of which tends so frequently to fill up the wards of fever hospitals.

With regard to the lunatic wards of an Irish workhouse (inspected on the 30th March, 1892), the Government inspector wrote :—" I regret I cannot

report favourably of the cleanliness of the patients *or their rooms*, and I found at least one or two beds infested with disgusting vermin. I have no wish to throw any exaggerated blame on the infirmiry nurse. It is simply impossible that she can supervise the nursing of a large workhouse hospital, and give at the same time close attention to the infirm and degraded among the lunatics." In another place the same inspector writes:—"All such patients should get a warm bath at least once a week; but one of the men told me that he had not had a bath during the five years he had been in the house!" I have before me a list of about eight workhouses, the lunatic wards of which have recently been reported upon, being infested with vermin, etc.; but many, or all, of the Irish asylums and workhouses are much overcrowded, and plans for their improvement and enlargement, and for the erection of new asylums, are in active progress, as, indeed, is the case generally in England and Scotland.

Returning to the subject of fever wards for the insane; the materials of which these are to be erected, the precautions to be observed in their construction, and the arrangements for heating and ventilation, would correspond usually with those generally adopted now in cottage or other hospitals of moderate size, and it is obviously due to the nurses of the fever wards that every precaution and care should be taken by the architect to provide all those conveniences and advantages for their well-being that can possibly be contrived, having in view the dangerous duties they may have to

perform in the case of insane patients, who not only may be violent and suicidal, but also be suffering from very infectious and loathsome diseases, and requiring the closest and most careful attention both as to their bodily and mental condition.

The apartments requisite for the fever nurses provide arrangements for a hospital matron, nurses' sitting-room, kitchen, and offices on the ground floor, and bedrooms, etc., on the upper floor. It would be well to provide a small airing-court or inclosed garden for convalescent patients, which might be so arranged as to prevent the escape of patients on the one hand, and the too near approach to the fever hospital of those patients working upon the asylum estate on the other.

In many county asylums a certain number of private paying patients are received, and these are occasionally provided for in wards set apart for their use; but sometimes detached buildings (forming almost separate institutions) are provided within the precincts of the main asylum. These may be in the charge of a medical officer acting under the authority and direction of the medical superintendent of the main asylum, from which the stores and supplies would be derived. Occasionally these private patients have been lodged in the mansion purchased with the asylum estate. This has been the case at Claybury, in Essex, where one of the largest asylums in this country has been recently erected. The old hall left on the estate has been altered and arranged for the reception of a considerable number of private patients, and its proximity to so

important an asylum will doubtless be of great advantage to the inmates. The apartments of the house are lofty, and the establishment very suitable for the purpose to which it has been converted. The estate is very beautifully situated, being well wooded, upon high ground, and in a very healthful locality.

At Denbigh, extensive additions to the North Wales Asylum have been considered, and in this case it has been proposed to erect a detached building purposely for private paying patients (within a hundred yards or so of the main asylum). This institution is also placed in a magnificent situation, with charming views on every side of the distant mountains of Wales. It is badly planned in many respects, but the alterations and additions (which I believe are now in hand) will probably tend to bring it up to date.

In planning (in connection with a county lunatic asylum) the buildings to be occupied by paying patients, the accommodation may be upon a more liberal scale, as regards the areas of floor spaces, decorative and other matters, than the portions to be occupied by pauper patients. One or more dining-rooms for males and females, and under some circumstances possibly a few private sitting-rooms may be provided; but every precaution must be observed to provide in all cases ample means of observation of the patients by the nurses and officers. Billiard and music-rooms, which should also be provided for in the main asylum, should certainly be provided here; but generally the amount of luxury and comfort supplied would correspond, to a

certain extent, with the terms charged per patient, which may vary very considerably, according to the neighbourhood in which the asylum is situated, and whether the paying patients are from the town or country. In the former case the relatives of tradesmen patients may be only able to contribute a few shillings per week, and it is from this class I believe that the paying patients in county asylums are chiefly drawn.

The general arrangement of wards for the private paying patients would be under the supervision of its chief medical officer. The building would have the usual airing-courts for males and females, and residences for the servants, nurses, attendants, and medical officer (deputed by the superintending medical officer) having charge of this branch of the asylum work. And here it may be observed that the smaller the asylum the better it is for the patients (as a rule), and the greater their chances of recovery, for there is, of course, more individuality of treatment, and greater opportunities for the study of cases. On the other hand, there are some important advantages connected with large asylums, the equipment being more complete. Many things are here provided for periodical use only, and if small numbers of patients are brought together, many matters cannot be provided on account of their costliness; and in large asylums a greater variety of attendants, nurses, and officials can be afforded.

CHAPTER VII.

THE mortuary and immediate approaches thereto should be in a building situated well out of the view of all the apartments occupied both by patients and attendants. It should contain two apartments for the bodies of male and female patients, placed on each side of a spacious and well-lighted post-mortem room, fitted with fire-stove, lavatory, and hot and cold water services. In some instances a pathological laboratory and museum are placed in the same building, where are preserved specimens, and where pathological and experimental studies are carried on. But some authorities prefer that the laboratory should not be near to the mortuary (which if well placed, should be as far from the main asylum as practicable, and is therefore inconveniently situated for the medical officers). It would, upon the whole, be better placed if near to the residences of the assistant medical officers. There should be a skylight inclined to the north, giving ample light ; there should be plenty of wall space for shelves, cupboards, and a sink with a hot and cold water supply.

In the mortuary building there may be added a waiting-room and jury-room, and it would be well to provide inspection-windows in the mortuaries, that the jurymen might be able to view bodies without the

necessity of approaching those bodies that may have decomposed, and similar to those necessary in the case of the fever mortuary before mentioned.

Near to the pathological rooms may be an office for the use of the assistant medical officers, in which they would transact the case-book business, and where they would keep the various instruments, etc.; the dispensary is frequently used for these purposes, but is considered unsuitable. In this office would be fitted, for surgical examinations, a weighing-machine, electric batteries, and various other appliances requisite for the investigation of the mental and bodily condition of patients. The photographic room, however, should be conveniently near to the receiving room, arranged for suitable lighting, and glazed with glass of a suitable description.

The amusements of the patients are provided for in the recreation-hall, music and billiard-rooms, etc., within the building, and in the airing-courts and cricket grounds without. Their education is forwarded, when possible, in a room or rooms set apart as a school, but this occupation is suitable only for a comparatively small number of patients. These may be near to the sewing-rooms of the females, and the work-rooms of the males. The idea of the school is not to contend with the insane ideas of the patient, or to demonstrate by philosophy the impracticability of his projects; but to withdraw his attention from morbid ideas to matters which are of use and interest. It may, in some cases, be a useful means of awakening

the mind, and of imparting the elements of mental culture to patients who were previously ignorant. Like all employment which excites the brain, it ought never to be permitted in acute stages, and never continued but for a comparatively short time; the subjects of instruction should be regulated according to age, sex, and previous education, and may consist of elementary instruction in music, drawing, history, and attractive subjects. It may be combined with recitation, and might sometimes with advantage be conducted on the principle of mutual instruction, the more educated patients being encouraged to assist those with less knowledge. Lectures, walks, games, tea-parties, balls, theatrical entertainments, etc., also serve to engross the attention, and amuse the patients.

Work is decidedly advantageous for the quieter patients and during convalescence, where the desire for work is apparent. In some cases, all healthy thought and action is closely connected with their ordinary employments and callings in life, and the artisan can often only find in his occupation the best means of recovering his mental capacity. There should always be ample means for thorough access to all workshops by the supervising officials. The lighting, ventilation, warming, fittings, and other arrangements should all be of the highest quality, and ample lavatory, water-closet, and urinal arrangement must be provided in suitably-placed annexes, care being taken to provide separate sanitary offices in all

arrangements, dividing quarrelsome patients from those who may be quiet and disposed to be orderly.

In all cases of insanity, whether recent or of long standing, next to diet, a judicious regulation of rest and activity is most necessary to be observed, fresh and open air, and, in the less acute cases, abundance of outdoor exercise on foot, and sometimes in a carriage. No asylum is complete which has not space sufficient to admit of prolonged outdoor exercise for all classes of its inmates, in gardens, airing-courts and fields, etc. In many chronic cases it has been found very beneficial to prescribe gymnastic exercises and cheerful games which necessitate exercise, where in the mild excitement of the game the patient may forget self and distressing thoughts. Sleep should be the result of work, of exercise in the open air, of fatigue. It is also promoted by baths and quiet; but narcotics should be avoided as far as practicable.

The airing-courts for patients should be laid out with good paths, flower-beds, lawns for tennis and croquet, and be planted with shrubs, ferns, and flowers, and in every airing-court should be placed a few water-closets and urinals, a shed for garden-tools, watering-cans, and garden-hose, etc. A few garden seats and arbours also might be provided, but in all these matters it must be arranged that the patients may be well under observation at all times, and that there shall not be easy means for hiding.

The fences round the airing-courts may be con-

structed with iron railings erected upon a dwarf wall, the whole being about 12 ft. in height. These are far better than brick walls, which, to be of utility, would not only have to be of considerable height, and therefore expensive, but have the further disadvantage of arresting the free circulation of the air about the grounds and buildings. To obviate this difficulty, a sunk or "ha-ha" fence is sometimes provided, which has a manifest advantage in one respect, inasmuch as the prospects of the surrounding country are left open and uninterrupted.

In former times the airing-courts were merely paved yards surrounded by high walls, and were frequently of very small area compared with the numbers of patients dealt with. This, I believe—at all events, as regards this country—is a thing of the past; but many airing-courts or gardens are far from being laid out so well as they might be, some being of rather small dimensions. For an asylum of 1,000 patients, the land required for airing-courts should be not less than 20 acres. Any trees planted near the fences must be cut from time to time, so that branches therefrom may not afford means of escape.

The paths in the airing-courts should be usually 7 ft. or 8 ft. in width, thoroughly well made, in suitable forms for throwing off rain, with a foundation of not less than 6 in. of broken bricks or other suitable material. The airing-courts generally should be drained with agricultural drain-pipes, unless there be special reason for dealing with the area otherwise.

The walks should be laid out in undulating forms, but not arranged to resemble a maze.

The garden-seats should be placed upon small patches of paving or asphalte, and may be of wood. In an airing-court used usually by 100 patients, there should be seating of this description for about 25 patients placed at the most desirable points—some under the shade of trees, others in places where good prospects may be obtained.

Some accommodation should be provided in the airing-courts for such of the elderly patients as may be infirm or weak. This might be in the form of ornamental arbours where shelter from the elements could be obtained by the patients generally when necessary. Aviaries and pens for birds and animals may be provided for with advantage in specially designed buildings or sheds, of more or less ornamental description. These things interest patients and attendants, and give common pleasure to many. These buildings might be so planned by the asylum architect as to also include a room for storage of the materials requisite for the various outdoor amusements and games.

In some instances the airing-court closets are placed against the wall or fence in the centre of the sunk "ha-ha," the approach thereto being by an incline or steps from the general level of the ground. An objection to this arrangement is entertained by some medical officers upon the ground that closets when so sunk are liable to form hiding-places for patients. One advantage of placing them below is that they

would be less conspicuous, and they are certainly unsightly features for view from the asylum windows. These places should always be carefully searched, by the attendant in charge when returning with the patients to the asylum buildings.

The airing-courts should always adjoin the wards of the class of patients for whom they are intended, and in most cases it is desirable that there should be some space between the fences, so that patients differently classified may not approach too close to one another, or communicate with each other from each side of open iron fences.

CHAPTER VIII.

THE general approach to the main asylum and airing-courts (from the public road) should be arranged so that there shall be at the entrance to the grounds a residence for the lodge-keeper. For some asylums a lodge is provided with several adjuncts. The minimum accommodation should, however, include a parlour, kitchen, and the usual offices, with three or four bedrooms, according to circumstances, the windows of the living-rooms being placed in the usual position so as to command a view of the gates. There should also be a waiting-room, with a small office. This might be used on various occasions—for instance, during visiting days, where patients' friends would be detained to show their authority to visit, or their fitness to do so ascertained prior to their further admission on the asylum grounds; for these persons w.c. and urinal accommodation may be provided. On the opposite side of the entrance may be a second residence for an asylum official, or a number of attendants' cottages. At some asylums the distance from the outer entrance lodge to the main asylum buildings is considerable, and therefore the provision of a shelter for visitors and tradespeople is certainly most desirable should a waiting-room not be provided. The shelter might take the form of a

verandah attached to the lodge. In the design for the lodge and entrance-gates, considerable scope is allowable for ornamental treatment, which, however, would be less permissible on other portions of asylum buildings intended chiefly for pauper patients, and which ought to be built with some regard for economy now that lunacy is alleged to be increasing in some districts (even beyond the ratio of the natural increase of population). Upon this subject the medical superintendant of a large district asylum says :—

“The immediate cause of the continuous increase of the asylum population is, of course, the preponderance each year of the admissions over discharges and deaths combined. The conditions differ from those of ordinary hospitals, in which, if a patient does not recover, and fails to improve after a fair period of treatment, he is discharged as incurable. But in an asylum *all the incurables have to be kept on as permanent patients*, except a few which may be sent to workhouses ; so that from the nature of things an asylum population must perforce go on increasing until the admissions are balanced by an equal number of discharges and deaths, a condition of things the occurrence of which is only a remote possibility at present. Were all the other hospitals for the sick conducted on the same principle (unavoidable in the case of asylums), they too would be rapidly overcrowded with occupants, and like asylums, there would be an ever-recurring necessity of adding to their accommodation by *structural additions*. This pecu-

liarity, connected with asylum economy, is one apt to be lost sight of, or, at least, not to receive the attention which it deserves."

In arranging for future extensions, it is better to allow space for additional blocks of buildings rather than arrange for adding upper floors at a later date to the disturbance of the whole asylum, and it is certainly necessary to calculate the capacity of the required *administrative buildings* for the final number of patients to be accommodated after the full extension likely to be attained.

Judging from the reports of those who have inspected some of the asylums in Ireland, it would appear that the buildings are too often allowed to fall into a great state of dilapidation. The attention of the authorities has been continually drawn to structural defects in the Irish asylums, and I believe that steps are now being taken in various institutions there to make good the deficiencies. The requirements of the Board of Control in Ireland are less stringent than in England—for instance, the day-rooms in Irish asylums need not contain more than 30 superficial feet per patient, whereas in this country the Commissioners in Lunacy insist upon a minimum of 40 square feet per patient, thereby increasing the cost per patient (for day-rooms) 25 per cent.

In many asylums the staircases are very defective, being dark, narrow, and so planned that patients have chances of concealing, falling, or purposely injuring themselves. The staircases in all large asylums should

be so arranged that there may be at least two means of escape from every day-room or dormitory; the stairs should be built of stone, or materials of fire-resisting qualities, be without winders or long straight flights; the well should either be built up solid or otherwise used and inclosed to form a ventilating shaft, etc. The divisions separating the staircases from the various apartments should also be of fire-resisting materials, and handrails must be securely fixed on *both* sides of all staircases.

These arrangements are applicable as well to the staircases for the exclusive use of the attendants and nurses as to those for the patients, for experience has, unhappily, shown that there can be few more terrible or heartrending calamities than the burning of a large asylum.

All the doors (at all events of important rooms) should be so hung as to open in the direction of the exit to the staircases; therefore the staircase landings should be enlarged so that these doors, when opened, shall not impede the passage by reducing the width of the stairs at any point.

The reason for omitting or blocking-up the open wells in staircases is that these afford favourable opportunities for committing suicide. The number of steps in a straight flight should not exceed eight or ten as a rule; the treads may be 11-in. and the risers 6-in.; the handrails should be of wood, and of a contour suitable for giving the opportunity of a comfortable and firm grip by the hand.

These alternative staircases are, of course, very costly additions; but in large asylums they are of great importance, and should never be omitted. They are not for everyday use (except by officials as a ready means of making a circuit through the wards); they should be locked, the panic key being kept in a glazed box, the glass to be broken when the key is wanted, the breaking of the glass causing a general fire alarm. The upper officials would, however, pass through with a master-key.

Epileptic patients are so liable to fall and seriously injure themselves during a fit, that special precautions are necessary. Epileptics fall forward or sideways as a rule, and are, therefore, more likely to be badly hurt when coming down than in ascending a staircase; therefore the approaches to the staircases, as well as the flights of stairs, should, as far as possible, be arranged so that the attendant and nurses may be reasonably near passing patients.

The ground and upper floors should usually be upon one level (at all events, in each block of buildings). Flights of three or four steps, or odd steps between the various wards, are very objectionable and dangerous. In large asylums it occasionally happens that the site is so uneven that there must, for reasons of economy, be differences in the levels of blocks for the patients and various departments of the administrative buildings. In these cases it is always far preferable that the main and other corridors should be inclined rather than steps should be

inserted, and for the additional reason that it is convenient to be able to wheel a supply waggon or other appliances.

The staircase and its landings sometimes afford suitable localities for the hydrants, fire appliances, buckets, hose, etc.; but if these be placed near, very ample space should be allowed (over and beyond what is required for passage-way), and these appliances also must be as far as possible protected from damage or interference by patients.

During the variations that take place in a patient's conduct, a change in his gait is frequently observed. He does not lift his legs properly, walks stiffly, involuntarily deviates to one side when attempting to walk straightforward, and easily stumbles if the floor be at all uneven—for example, when going over a step; hence the absolute necessity of planning an asylum without unnecessary steps. Some of these classes of the insane take a pleasure in walking about a great deal; some of them even experience a constant desire for a restless change of scene. They like to take long walks, and to the inexperienced eye nothing striking is presented so long as they keep upon level ground; but the gait eventually becomes still more unsteady, like that of a drunken man—the feet are dragged after him; the knees appear as if they would collapse; he must support himself by a wall; stumbles every moment, and frequently falls; the arms become stiff; objects are grasped convulsively, and occasionally suddenly let fall. Under such

possibilities as these, it is obvious that the fewer the levels in an asylum the better for all concerned.

The day-rooms of asylums may be either on the ground or the first floor (but seldom or never upon a higher level) therefore the boot-room, previously mentioned, may often be placed with advantage near to the staircase, so that patients coming in from the airing-courts shall not bring dirt, etc., on to the stairs, on their way to the *upper* day-rooms. In some instances it may be useful to have two boot-rooms adjoining each other, one for each floor; this might be useful for separating patients of different classes, when those on an upper floor require to be specially classified.

CHAPTER IX.

THE corridors of a county lunatic asylum are frequently of great length, and should be of ample width where affording direct communication from the patients' wards to the dining-halls and recreation-rooms, etc. They should, for a large county asylum, seldom be less than 8 ft. or 10 ft. wide, but are occasionally rather more; being of such great lengths, it is easy to arrange for gentle inclines (instead of steps), as already referred to.

Of whatever materials these corridors may be erected, it is necessary to provide against the possibility of fire communicating through from one block of buildings to another. To avoid this there should be fireproof portions at the communications with each block of buildings; the windows of the main corridors should not exceed in number those actually required, and should be so disposed that patients occupying the airing-courts may not be seen whenever their habits or condition renders it desirable that they should be kept as much out of view as possible (and this is a condition which should be observed elsewhere throughout the asylum). There should, however, be no dark corridors anywhere in any asylum, and if it should be found inconvenient to place windows in any part of the walls, skylights must take their place.

The flooring of the corridors may either be of wood-paving or of some of the artificial stone-pavings, such

as Stuart's granolithic, the Adamant Company's flooring, Lawford's asphalte, Polonceau asphalte, Willis and Astley's flooring, patent Victoria stone, Val de Travers, Wilkinson's concrete paving, etc. Some floorings have been found to give faint and unpleasant odours after washing; others become slippery, loose, or uneven, and as the amount of material used is frequently very great, it is of special importance to select that which is durable.

Amongst the most important duties of medical superintendents of asylums are the suitable classification and distribution of the various kinds of patients. It has been mentioned in a previous paper that there should be at least four *chief* divisions of patients on each side of the asylum for each sex (placed, for preference, in at least eight blocks of buildings connected with each other, and with the administrative buildings by corridors from 8 ft. to 10 ft. or more in width).

But each of these blocks of buildings may be subdivided in many ways, the general idea being to obtain a number of separate suites of rooms, each containing not only its own dormitories, day-rooms, single-rooms, and officers' apartments, but also independent bath, lavatory, and water-closet accommodation, the exits and entrances being so arranged that one sub-class of patient shall not be able to interfere with another, or be able to pass through rooms in which he may not be sub-classified, except perhaps where it may be necessary to provide doors of communication for fire or panic emergencies.

It would practically be impossible for any architect to so plan a large asylum that every description of the insane would be located in separate wards; indeed, the intermingling of certain classes is said to be advantageous, the stronger patients assisting the weak, the merry cheering the infirm or melancholic, etc.

All the insanities may, however, be distributed in fewer departments (*in suites of rooms*) arranged somewhat as follows on the ground and first floors of the asylum (*the second floor, when existing, being only used for associated dormitories for quiet chronic patients*):—

1. A series of *small* wards for recent cases.
2. Wards for the sick, aged and infirm.
3. Wards for general paralytics, suicides, etc.
4. Wards for epileptics.
5. Wards for turbulent patients.
6. Wards for chronic demented and weak patients.
7. Wards for patients noisy in dormitories.
8. Wards for working and convalescent patients.
9. Wards for laundry patients.
10. Detached wards for fever cases, etc.

The architect in arranging for the position of these sub-departments has to consider that recently admitted cases require very much greater care and attention than most of the other patients, for their habits, chances of recovery, and proclivities have all to be ascertained. Therefore, all new admissions are best placed under the care of a thoroughly experienced nurse or attendant, who must not be burdened with

the charge of very many ; otherwise a newcomer might be dangerous to himself or others. The day-rooms or dormitories for these patients should not be very large or contain many patients, otherwise the contact of a new patient (possibly only slightly insane) with others of alarming habits would probably be greatly to the disadvantage of the former.

General paralytics, as well as epileptics, require considerable supervision at night. Many of these are placed in single rooms to sleep (on account of their filthy habits). They are, as a class, liable to be meddlesome, and undesirable (upon account of their feebleness) companions for strong patients of the epileptic class ; but their single rooms may be placed with doors opening into dormitories occupied by suicidal patients, who are under special supervision at night. There is said to be an advantage in placing the general paralytics with the suicides, the high spirits and liveliness of the former being a desirable set-off against the melancholy of the latter, who are as a rule, more dangerous to themselves than to others. Violent patients are usually warded together, and generally it is found that this system is a good one, inasmuch as a violent patient has frequently sufficient discrimination to object to violence from others ; whereas if he were warded with the feeble and in-offensive he would be obviously much more dangerous ; but feeble and quiet, and vigorous patients may be warded together, provided that the latter are not otherwise undesirable as companions.

All patients who may have a propensity to hammering or shouting at night should be warded together in blocks of buildings as far away as may be from the wards for the sick and infirm patients, or those requiring special rest and quiet, and so as to preclude as far as possible the disturbance of the officials and other patients generally.

Offensive and dirty patients should, wherever placed, never occupy rooms where the specially clean and respectable patients are lodged, and the latter should be provided by the architect with rooms where they cannot be annoyed by those under the influence of a disgusting mania or habit.

The satisfactory arrangement of the plan for an asylum for a large number of patients is a most difficult matter and even if all the numerous and perplexing classifications of patients be successfully dealt with, yet there remains frequently a great difficulty in connecting the patients' wards with the administrative buildings; and, again, within the administrative buildings the arrangements for lodging the different grades and sexes of the officials are often difficult to contrive. But when everything has been fairly well arranged by the architect, and every detail has been carefully planned, and all is in good working order, it has often happened that additions after additions are made to the buildings to provide for the constantly-increasing numbers of the insane. Then troubles begin; all the arrangements are upset; the administrative buildings and appliances become insufficient or unsuitable.

CHAPTER X.

THE whole of the officials and servants of an asylum have their duties distinctly defined, and the chief control of an asylum usually belongs to a committee of visitors representing the County Council of the district, from whom all responsibility for the care of the asylum and patients is obtained; in their absence the medical superintendent and his chief assistants act upon general instructions received. Strict discipline amongst the whole of the staff is absolutely necessary for the safety and comfort of all concerned, as well as for the orderly conduct of the business of the institution, and this cannot be properly effected unless the asylum architect so plans the asylum buildings that the various grades of officials can be suitably housed (and where necessary isolated from each other), the male and female servants, male and female attendants, married attendants, medical officers, etc., all having their allotted quarters, with isolated bedrooms, arrangements, lavatories, bath-rooms, mess-rooms, and other conveniences.

At some asylums large numbers of the male and female attendants have been found to give up their appointments, frequently upon account of the uncomfortable accommodation provided for them in their dayrooms, mess-rooms, bedrooms, or dormitories, etc.

The asylum architect should endeavour to provide separate bedrooms or cubicles in the larger attendants' dormitories, and give the staff of officials generally as much privacy as may be reasonably obtainable under the circumstances. A larger proportion of cottages or apartments within the asylum suitable for married attendants than is often provided would appear to be desirable, as men so provided for have been found more frequently to settle down to the service than the single ones of either sex.

The importance (to patients) of this subject of the accommodation of attendants is very great, for if the insane can be *continuously* dealt with and cared for by a nurse or attendant who knows all their peculiarities and what is necessary to promote their recovery, and has gathered (by perhaps a lengthy experience) the most desirable way of dealing with them, their prospects of ultimate recovery are obviously promoted, and it appears desirable that the building committees of asylums should direct their architects to provide on their plans for a fair proportion of quarters for married men (that they may be induced to stay), as well as comfortable residences for the unmarried of both sexes.

In an asylum alone does the patient (who can no longer take his part in the duties and business of life) find all that his misfortunes require; medical men well acquainted with the treatment of cases corresponding or similar to his own; skilful and experienced attendants who, as well as all about him, know how

to treat him suitably to the circumstances of his condition; a home where his eccentric behaviour is concealed from over-officious eyes, where the necessary surveillance is unobtrusively accorded him, and where he has usually a far greater amount of freedom than would be safe under any other circumstances. It is also found that the restless habits of a patient and the noisy expression of his maniacal impulses are to a great degree controlled by the example of other patients. Here, in a well-ordered asylum, he should meet with forbearance and attention, with common sense and words of kindness, and he should be made to feel (so far as his case may allow) that he is being treated as an actual invalid, that he is in a *hospital* rather than a prison.

The patient becomes conscious of an intelligent, gentle, and constant superintendence, from which he gathers confidence and hope; and the sight of the other patients, already well and fast convalescing, awakens in his mind the hope that his own health will also be re-established, and when the natural longing for return to his home again springs up, generally speaking, the patient leaves it with entire confidence to the discretion of the physician to fix the date of his dismissal.

In the construction of any asylum, private or public, one leading point to be observed is the provision of safeguards against accidental injury to the patients, many of whom are so bodily or mentally feeble as to require the most constant care. For this

reason it is that all staircases must be built up, as before mentioned, without open well-holes, down which patients might fall purposely or accidentally; that every fireplace must be guarded; that steps and obstacles be as few as possible; that all angles be rounded off in mantelpieces and in passages and rooms; and that there should be no dark or out-of-the-way places for patients to hide or misconduct themselves within.

There are many items of construction in asylum buildings which require special care; for instance, iron gratings in floors or walls, which may be used in connection with the heating and ventilating appliances, have been objected to by many asylum officials upon the ground that some of the more demented patients have been found to push food, meat, fruit, dirt, stones, and filth through the interstices of the metal work, causing great trouble and annoyance in frequent cleansings and examinations, offensive odours, and stoppages of the working of the apparatus. So in those instances (where it may be difficult or impossible to avoid the use of gratings in accessible positions) every care should be taken that the whole of the gratings may be easily removed for cleansing purposes—at all events, from those places accessible to meddlesome patients, or those inclined to hide food or other matters.

The fire-guards, which are absolutely necessary in most parts of all asylums, should not only be locked in their places by the attendants, but also be con-

structed somewhat lightly, so as to give way a little should a patient fall against them. These should have no sharp edges or dangerous angles, for patients are liable to fall against them during epileptic fits, or as a result of other contingent troubles.

All blocks of buildings intended for noisy patients should be constructed specially with the view of deadening sound as much as possible, and if the floors be of concrete construction with wood flooring laid thereon, this object will be attained to some extent; but the walls might well be double, with a narrow air-space between, and other obviously necessary means for stopping the travelling of sound adopted. The windows here should be of as small an area as may be compatible with the ingress of sufficient light, and if the floors are to be of wood (and not of fire-resisting materials, as they certainly should), the space between the floor and ceiling below should be packed with silicate-wool, sawdust, or other suitable material for the purpose; also, in some positions, both doors and windows would require to be double.

The interior wall surfaces of the wards are treated in a great variety of ways in this country, from plain brickwork to brightly-painted or papered coverings. An unfinished brick surface is certainly for many asylums an unsatisfactory face, and if adopted for reasons of economy, should certainly be painted over in oils, and the angles executed with bull-nosed bricks. In districts where the patients (as in some parts of Ireland) are drawn from a poor population, living in

mud cabins or miserable huts, the brickwork interiors for the wards might be sufficient; but in this country the walls should be plastered and painted or papered, not all the rooms alike, but with gay colours and moderate variety of arrangement.

With regard to the most suitable forms of windows for asylums there is some difficulty. There are many disadvantages with sash windows; but upon the whole these are at present considered the best for the purpose, having in view the requirements of light, ventilation, and applied contrivances for preventing patients from escaping or injuring themselves. The dangers of windows include the possibility of a patient securing a piece of glass to form an instrument for homicide or suicide; the sash window cord supplies a rope for hanging, and the window bars a possible gibbet. Windows should reach nearly to the ceiling, so as to give as much light and ventilation as may be necessary, and so that there may not be stagnant air at the top of the rooms; and when the patients are *seated* in the wards, they should be able to look out into the airing-courts and country beyond with freedom. For this purpose the window-sills should not be more than 3 ft. from the ground. Blinds are usually provided for the windows; these should *never have cords*, but a hook or ring should be fixed to the bottom of the blind, which would be raised or lowered with a pole-hook by the attendants and nurses.

There is a possible economy by employing asylum patients upon the works of levelling, excavating, and

embanking the earth-works connected with asylums. It may be stated that, owing to the greater prevalence in England and Scotland of grave forms of insanity, epilepsy, general paralysis of the insane, etc., which arise from organic diseases of the nervous system, the numbers of persons who may be so usefully employed in those countries are much less than in Ireland. For instance, in Mullingar Asylum, out of 622 patients (in one year), only ten patients were found to refuse work, while but fifty-four were prevented by mental, and twenty-five by bodily causes, from taking up some useful occupation. It would, therefore, appear that in Ireland very considerable assistance might be given by patients upon certain building works connected with asylum construction ; and as there appears to be a great increase in lunacy in that country, and as a minimum of financial expenditure is of even greater importance there than in this country, these facts are well worth the consideration of architects, medical superintendents, and asylum committees, especially if it be remembered that when asylums are being enlarged the area of the estates upon which they stand remains, very frequently, without a corresponding increase. Additional land not being purchased (for financial reasons), the areas per patient decrease as the number of patients are increased, and, unfortunately, less become the opportunities for providing sufficient outdoor or laborious work for those classes of patients who are not only well able to perform it, but also most certainly benefit, mentally and bodily, by such

occupations. In Ireland it is no uncommon occurrence during the summer months to meet on the roads around the asylums groups of patients returning to their wards from haymaking and similar employments, to all outward appearances as rational and contented as a body of labourers going home from their ordinary daily toil.

There can be no strong reason brought forward why architects should not contrive to avail themselves of patients' labour in asylum works to a far greater extent than has been the rule hitherto, and a good example has been given by the resident medical superintendent of the Mullingar Asylum (where about 800 patients are cared for), who undertook various alterations, additions, and improvements to his asylum, including the plastering of the corridors and the building of a coal-shed (74 ft. in length by 40 ft. in width), the erection of new workshops, etc., all carried out by asylum labour; and I note that in this asylum (at the time the works were executed) there were, among the patients, on the average, only five painters, five joiners, one plumber, three masons, and two slaters. It may, therefore, be assumed that some ordinary labourers amongst the patients must have been induced to work upon the buildings. Again, at Limerick, an observation dormitory for the accommodation of forty-four female patients has been completed entirely by asylum patients, who have also erected a dormitory for dangerous epileptic and suicidal patients, which, it is stated, will contrast not unfavour-

ably with the similar departments of even the most expensive and advanced public asylums in England. It provides a dormitory 84 ft. by 21 ft. by 14 ft. in height, for thirty-eight patients. Off this dormitory is a corridor, 50 ft. long and 8 ft. high, both being wainscoted and floored in pitch pine. Opening off the corridor are six single rooms, wainscoted throughout, and one padded room, each provided with a window, 7 ft. by $3\frac{1}{2}$ ft., protected by a single shutter. At the other end of the corridor are closet, bath, and store accommodation. The dormitory has cross light and ventilation, besides a large bell-shaped ventilator communicating with a louvre in the roof, and placed over a gas star, which is used for night-lighting. In this asylum there were, as patients, nine painters, nine joiners, two masons, and one slater, and about 100 labourers.

Such works, however, whether executed by asylum patients or ordinary workmen, should always be placed under the control of a competent architect; but there is ample evidence to show that there is much valuable work to be obtained from male asylum patients when their labour is properly directed, and also that it is not well that such an economy should be deferred until it is forced upon a district by reason of a difficulty in obtaining Treasury or other loans, or otherwise procuring funds (a trouble which appears to have arisen in connection with some asylums, and in consequence of which many are overcrowded or out of repair).

The Commissioners in Lunacy require that plans and particulars in reference to proposed asylums requiring their approval shall be submitted as follows:

1. One or more sheets of the Ordnance map of the district in which the asylum is to be erected, or some other large map in which the situation of the proposed asylum, and all the public roads and footpaths in the vicinity thereof, are clearly and fully defined.

2. A general plan of the land (with the block of the buildings and offices), and of the exercise-grounds, garden, and road of approach, with the levels of the surface of the ground at the quoins of the building, offices, and fence-walls figured thereon; this plan to be drawn to a scale of 100 ft. to an inch.

3. Plans of the basement and drains, and ground and other floors of the building and offices, also roof-plans and elevations of the fronts; these all to be drawn to a scale of 16 ft. or 20 ft. to an inch.

4. Elevations of portions of the principal front, and also of any other parts in which any variation therefrom takes place, drawn at a scale of 8 ft. to an inch.

5. Transverse and longitudinal sections, or sufficient portions thereof, to show the construction of every portion of the building at a scale of 4 ft. to an inch.

6. Plan and section of one separate sleeping-room, dormitory, and day-room respectively, or of part of the same, showing the method of warming, lighting, and ventilating each; also of the baths and washing-rooms and water-closets; and drawings and descriptions of

the windows and shutters, drawn to a scale of 2 ft. to an inch.

7. A concise description of the whole of the intended works, and an estimate of the cost of the buildings.

8. The general system of heating, lighting, and ventilation proposed to be adopted throughout the asylum to be fully described.

9. The thickness of the walls and the scantlings of the timbers of the floors and roofs to be figured.

10. Each plan to show the several classes and numbers of patients to be accommodated in the wards, day-rooms, dormitories, single rooms, galleries, and airing-courts respectively to which such plan relates. In the case of dormitories it is convenient that the number and position of the beds shall be indicated by lines.

The lines of sewers and drains, with positions of manholes and ventilating shafts, should be shown on the plans, so that the actual locality of any sewer, drain, manhole, or point of ventilation may be ascertained at once. A duplicate plan should show the lines of water-supply pipes, wells, cisterns, tanks, waste-water overflows, and fire-service hydrants.

In all, or nearly all, new schemes for asylums, architects are absolutely obliged (with their reports and estimates), to give a carefully prepared schedule of the cubical contents, priced out to meet the probable cost of the different portions; the workshops, sheds, and corridors, etc., being taken, of course, at a much

less price per cube foot than other portions where there may be costly fireproof construction, and, necessarily, more labour and materials involved in the erection; and, as the public are becoming concerned at the extraordinary costliness of modern asylums, as compared with former buildings for the same purpose, it becomes necessary that the cubical contents of all parts should be reduced to that minimum which is compatible with what is necessary for convenience and absolute requirements, and it may be noted here that a due use of day-corridors in an asylum, in place of day-rooms alone, is a manifest economy in asylum construction, tending, as it does, to a reduction of passages usable only as a means of communication, to a lessening of the number of day-rooms, and, generally, of the cubical contents to be estimated for.

In buildings for chronic patients, many of whom are employed in the grounds, fields, farm-buildings, or workrooms, the day-rooms are often not fully occupied, and should therefore not be very large. A few rooms of moderate size would be more convenient and comfortable. A few patients left in a large apartment (usable, also, by the working patients after labour hours) would not be economically accommodated, having in view the requirements of supervision and the heating and ventilation, etc., of an insufficiently occupied apartment. I have seen rooms about 100 ft. in length by 40 ft. in width occupied by not more than a dozen non-working patients, for whom alone it was necessary, of course,

to keep up a suitable temperature, but at a wasteful expenditure.

Fireplaces for single rooms are usually more suitable in the case of private asylums than in county lunatic asylums, where, generally, less supervision by nurses and attendants is practicable. A dement sometimes reaches so very low a stage that he will lie naked at night in the coldest weather, his bed-clothes on the floor, and without the necessary intelligence to re-cover himself; or he will, if permitted, seat himself so very near to a fire as to scorch his body. Where there is a fireplace in a single room, this latter contingency is of greater danger than in an associated dormitory or day-room; therefore hot coils or warm-air flues or some kind are necessary for all those single rooms, the interiors of which are not in such open communication with day-rooms or dormitories as to correspond in temperature; but if hot-water or steam coils be used, these must be arranged so that the patients cannot place anything offensive in contact therewith. For instance, a very penetrating and disgusting stench may be caused by a dirty patient throwing urine or filth upon a *hot* steam pipe, than which few things could be more insanitary and unpleasant.

The walls, floors, and roofs, etc., of many of the apartments occupied by isolated or associated patients require not only to be fireproof, but also *sound-proof*, and where, for any reason, these conditions cannot conveniently be secured by concrete, brickwork, or

other solid construction, silicate cotton (which is a pure mineral fibre manufactured from blast-furnace slag) may be usefully introduced into the spaces left by the iron and wood construction. Sometimes this is also applied in the form of plaster slabs lined with the silicate cotton, as at the Starcross Asylum, Devon, Warwick County Asylum, Wilts County Asylum, etc., where it has recently been so employed by the patentees, Messrs. Frederick Jones & Co., of Kentish Town, N.W.

Some patients of the noisy class will try to lift their bedsteads and hammer the wooden floors with the legs. Persons of this class must have bedsteads secured firmly to the floor, with or without locks. The beds in many cases are made very low, so that if a patient should fall out he may not seriously injure himself. At the new asylum at Claybury, in Essex, the County Council of London have adopted a spring bedstead as their standard pattern, which is manufactured of best steel tube, and has indiarubber pads attached to the feet to prevent noise, and the scratching or defacement by patients of the floors.

In every ward (preferably in an attendant's or nurse's room) cupboards must be provided for the reception of domestic appliances, games, medicines, patients' and nurses' stores or private belongings, special appliances, etc.

A few fixed seats, upholstered or otherwise, should be arranged for in the bay windows, recesses, and other suitable positions in both day-rooms and day

dormitories. In some wards these may be in the form of lockers for the reception of papers, books taken out of the library, or belongings of the patients; but in the dormitories these seat-lockers would serve for patients' clothes. Lockers are not always provided, but serve the purpose of encouraging tidiness amongst certain classes of patients.

Maple floors are occasionally made use of for hospitals, workhouses, and other public buildings, and there appears to be no reason why these should not also be adopted for some portions of asylums. Maple being harder than teak or oak, and having no open grain, there is no harbour for insect or other life, and it will not absorb or retain moisture, thus constituting a perfect sanitary floor. The timber should be weather-seasoned, and afterwards kiln-dried up to 120 degrees Fahr., so that the joints may always remain close.

It is said that a maple floor will outwear two of oak or teak, and many pine ones, so that it should be one of the cheapest floors in the market. The price, I believe, is from about 36s. per square, according to the thickness; but I am not aware that it can be obtained in large quantities, except from the Bennet Company, of London (Canada), who have representatives in Glasgow and at Kentish Town, London, N.W., where, I believe, some of their work is finished after being roughly prepared in Canada (for economy in ocean freight), the bulk of the consignments of timber being thereby considerably reduced.

CHAPTER XI.

IF by providing an asylum comfortably arranged and constructed (and even with some provision for luxury) a high rate of recoveries can be secured (together with a shortened residence of the patients), it would be manifestly a short-sighted policy that would only provide for the barest possible requirements, and thereby throw some pauper patients as a charge upon the ratepayers for a long term of years, or until an old age.

But for those classes of patients whose cases are absolutely hopeless, who are too demented to appreciate the value of expensive surroundings, a high expenditure upon the construction of asylum wards is not only useless, but a waste of the money of the already overburdened ratepayer. For instance, an incurable lunatic has been known to lick the walls and floor of his room with evident satisfaction, and under the impression that he was partaking of the most delicious fruits! Decoration and luxury for such as these would probably be of little use.

Ornamental work, in the architectural design of buildings occupied by pauper patients, should necessarily be very cautiously introduced, not only for financial reasons, but also, perhaps, because the hallucinations of the patients so frequently become

associated with some of the actual surroundings of the asylum in which they are kept, especially if these should be unusual in their appearance, grotesque in actual form, or casting dark or undesirable shadows ; for insane persons so frequently imagine that they see hideous and threatening phantoms or frightful animals, that it is obviously desirable that all adjuncts should be light and simple in outline as may be practicable, so that there may be as little as possible for the disordered mind of the patient to dwell upon, whether viewed in a dim light, in the twilight, or in a strong sunlight ; curiously enough, it has been said that hallucinations of the insane during daylight appeared frequently as though they were perfect realities, while those during darkness or a dim light are indistinct and shadow-like.

The ventilating and heating arrangements for a large asylum (consisting of a number of detached blocks of buildings) always greatly influence the construction of all parts, and should be regulated by the following conditions amongst others :—

1. That there shall be little chance of injury to the patients by fire accidents.
2. That the officials shall be able to control perfectly, both heating and ventilation, and that the patients shall not be able to injure or interfere with the apparatus.
3. That there shall be, whatever atmospheric conditions may exist, a perfect and continuous circulation of air.

4. That as regards cost of working, supervision and fuel, it shall be economical.

5. That the air supply shall be drawn from points where it is of undoubted purity, and far from any possibility of contamination.

6. That the heating of all parts of the asylum shall be worked from one centre, where would be located the boilers, and where the chief portion of labour would be performed.

7. That steam-piping or coils in apartments occupied by patients should either be absent or else be placed in situations inaccessible to the patients.

8. That the arrangements be so contrived that there may seldom or never be any occasion for the engineers to intrude upon the patients for the purpose of regulating or examining the apparatus.

The labour of coaling all the fires, although very considerable in a large asylum, would not appear to be a great obstacle against the use of day-room fires, having in view the numbers of patients available for the purpose; even on the female side of the asylum there are usually a considerable number of persons capable of any simple occupation requiring bodily strength.

None of the wards of an asylum should be without a well-lighted, dry, and conveniently situated store-room, fitted with shelves and other conveniences requisite for the various articles necessary in each department, and with a capacity equal to about 150 square feet to each 100 patients.

The general store-room of a large asylum is frequently of considerable dimensions, and may conveniently be of two stories, the upper floor being arranged as a gallery with shelving fixed on both sides of each gallery in such a manner that patients could not fall or throw themselves from the upper floor, the back of the high shelving taking the place (on the inner sides) of the balcony railings which would otherwise be necessary.

For an asylum of 1,000 patients, the following areas are recommended as the minimum required for various items :—

Crockery and sundries	...	200 square feet
Boot store ...	...	100 " "
Flour store	...	250 " "
Bread store	...	250 " "
Meat store	...	200 " "
Grocery store	...	350 " "
Butter, cheese, etc.	...	350 " "
Clothing ...	...	1000 " "
Bedding, etc.	...	1500 " "
Drugs, appliances, etc.	...	200 " "
Ironmongery, etc....	...	200 " "
Sundries ...	...	200 " "

In addition to the above areas a sufficient space must be allowed for receiving, weighing, and testing the various articles of consumption, and for dispensing the same to the occupants of the various portions of the asylum, and having regard to the necessity before referred to, of separating the sexes at the

points of distribution; this object may be attained by placing the general store-room between the two main corridors, the male officials and patients would approach the distribution counters at one end of the store-room, and the females at corresponding counters at the other end.

The steward or store-keeper's office or offices may either be formed by a partition within the store-room, or otherwise be arranged in direct communication with the stores, and in such a position as to command the approaches for the various tradespeople, carters, and others concerned with the supply of goods, and near to a weigh-bridge.

In some large asylums, I believe, separate offices are provided for the reception and distribution of the supplies, which are usually of numerous descriptions, and it is necessary that the construction of the floors and walls should be such as will be sufficient for the various weights to be imposed, but without unnecessary waste of material in excessive strength or costly construction.

In considering the areas necessary for storage it must be remembered that large supplies of clothing suitable for winter only must be stored away during the summer and *vice-versa*, and also that there are many appliances and specialities for the use of insane patients, all of which must have their allotted position; and I believe the rule in some asylums is that the reserve of clothing (in stock in the asylum) shall be equal to that supplied in the wards. The construc-

tion, therefore, of the general stores cannot be carried satisfactorily into effect without a prolonged inquiry and much consideration between the officials and the architect concerned in the erection of the asylum.

Every large asylum should have a suitable ice-room in which meat and other perishable stores may be kept during sultry weather.

Messrs. Werner, Pfleiderer & Perkins, Limited, of London, have supplied many asylums with ovens constructed as follows: In the ovens pipe heat-conductors are provided, formed of iron pipes containing a small quantity of water, and welded at each end so as to be quite air-tight, the lower ends terminate in the fire-box; these pipes are said to have been found uninjured after a service of fifteen years; the ovens work continuously, and are ready for one batch to be set immediately the previous batch is withdrawn, they are economical, cleanly, safe and easy to work, no smoke or sulphurous gases from the fire can enter the oven, and the heat can be maintained at the right temperature without difficulty; these ovens have been extensively used in asylums. Another oven suitable for asylum work is formed of four walls, forming a chamber (the furnace being quite outside and independent), through which the ovens pass, the fire has a down draught, and the products are conducted directly from it to the top of the chamber where they naturally spread, filling it entirely from the top downwards, and are ultimately drawn off through siphon tubes from the bottom; they thereby secure a precisely similar

temperature in all parts, and the ovens which are immersed in that atmosphere, are therefore bound to be equally hot throughout ; by opening or closing sliding doors in front of the fire, there is passed on to the chamber the exact quantity of additional heat necessary to make good the heat absorbed by the bread, and to maintain the desired temperature. So accurately can this be regulated that batch after batch of bread can be baked every forty-five minutes for any number of hours, days, or weeks without variation. These ovens have been erected in various county asylums and other extensive institutions by Messrs. Cox & Son, of Torquay.

Very large quantities of food have to be cooked every day for the officials and patients, and many varieties of tastes and appetites have to be catered for. The question of food supply and cooking is one of the most difficult connected with the whole subject of asylum construction, and there is reason for the belief that few asylums are quite perfect in their kitchen arrangements, and too frequently by reason of the neglect or misuse of the appliances provided, many of which are the result of a high engineering skill and scientific knowledge.

The food for pauper patients must not be unduly costly ; it must be cooked by means of an economical amount of fuel, whether coal, gas, or steam be employed, and the cost of labour in the preparation of the food not excessive beyond actual requirements.

The bakehouse does not usually provide useful

labour for many patients, certainly for not more than ten male patients in an asylum for 1,000 patients ; for these some lavatory, w.c., and urinal accommodation should be provided conveniently near to the bakery workrooms.

This question of the bread supplies required for asylums brings to recollection a circumstance illustrating the fact that the want of occupation is not an infrequent cause of insanity, and the importance of urging the patients to realise that they should, if possible, even while confined in an asylum, earn, at least, the bread they eat.

The owner of large estates, owing to a natural inactivity of mind and the absence of any useful occupation, sank into a state of mental torpor which terminated in insanity ; he was, therefore, taken to an asylum, where (with a view to his cure) he was told that he had no available means of subsistence unless he could and would work for his living, and that he had no longer the command of any wealth. The patient believed this, but showed no disposition to rouse himself from the state of indolence which had been one of the primary causes of his mental aberration. He folded his arms and sat down, doubtless expecting that in due time a servant would enter as usual to inform him that his dinner was ready ; but in this he was deceived. Dinner-hour arrived and no servant appeared, and at length the pangs of hunger roused him from his listlessness, and he began to call out loudly for something to eat. No one answered

him, and he passed the whole night in knocking on the walls of his apartment, and ordering his servants to bring him his dinner.

Next morning one of the attendants entered the apartment of the new patient, who thereupon imperiously demanded his breakfast. The attendant offered to go into the town to purchase something for the meal if the patient would give him the money to pay for it. The hungry man eagerly thrust his hands into his pocket, and in his dismay, finding no money, implored the attendant to go and procure him some breakfast on credit. "No," said the attendant; "no one will give you credit, but perhaps I can put you in the way of earning sufficient for your food." So the attendant employed the patient in carrying up wood from the cellars, who received in return just enough to purchase a loaf of bread.

He then had to set to work to earn his dinner as he had earned his breakfast, and this meal being a more important one, a greater amount of labour was exacted. Thenceforward the business proceeded with the most undeviating regularity, and the patient at last conceived such a liking for occupation, that his permanent cure seemed probable, and when the time for the patient's release arrived, a promise was exacted from him that he would every day occupy himself with bodily labour—on that condition alone could there be any security against the risk of his relapse to insanity. This particular labour experiment was carried into effect about half a century since by a

nobleman who had some years previously perceived the necessity for improvements in the "receptacles" for lunatics, and who converted his palace into a lunatic asylum (and himself became its superintendent.) This was a spacious mansion, the exterior aspect of which presented nothing differing from that of a handsome private residence. The windows, certainly, were grated, but the gratings were so ingeniously contrived that, were not attention particularly directed to them, it would not have been easy to have discovered their existence. Some of these gratings represented vine-leaves, tendrils, or bunches of grapes ; others were fashioned like the long leaves and blue flowers of the convolvulus ; foliage, fruit and flowers were all painted in natural colours, and it was only from a near view that the artifices could be detected.

In the construction and arrangement of the great hall of this asylum of more than fifty years ago, there appears to have been much that was far in advance of similar institutions of the period. This apartment was used for the patients to walk in and amuse themselves when wet weather prevented them from going out ; it was adorned with a profusion of flowers, growing in pots or cut in vases ; the walls were covered with fresco paintings representing humorous subjects ; it contained embroidery-frames, spinning-wheels, and even weavers' looms (from which it would appear that the work and amusements of the patients were not conducted in separate apartments as is now generally the case).

In the great kitchen of an asylum a limited number of patients are usually employed, and in the construction of this apartment, and the selection of the fittings attached to the cooking apparatus required, much care is therefore requisite that these persons shall not be able to trifle with gas and steam pipes, the valves of which should be placed quite out of their reach. In other respects the apparatus would be to a considerable extent similar to that required for large hospitals, workhouses, and other public institutions.

The construction of an asylum kitchen should be such as will allow therein an area of 2 ft. for every patient to be provided for in the asylum, but very frequently much less has been allowed, the result being a loss in efficiency, and inconvenience to the cook and his assistants, therefore for an asylum kitchen for 1,000 patients, it would be well that the dimensions should be about 50 ft. in length, and 40 ft. in width, or a total area of 2,000 ft.

The walls should be lined with white glazed bricks to a height of 6 ft. from the floor, or better still (if funds should permit), this brick lining should entirely cover the kitchen walls, which should, as already mentioned, be 18 ft. or 20 ft. in height. The apartment should be well ventilated and lighted from above, and the roof should be open, but never ceiled.

The floor may be of asphalte, cement, or some non-absorbent substance, and as the gas and steam-pipes from the central boilers may often very conveniently be placed in troughs below the floor level, care should

be observed to place over them iron cover-plates which may be easily removed when access to the pipes becomes necessary for repairs and cleansing, etc. (iron gratings above these troughs being avoided for similar reasons to those which have already been given in reference to the ventilating and other openings in the floors and walls).

While the kitchen for an asylum of 1,000 patients should not have an area of less than 2,000 ft., there should also be two sculleries having an area of about 1,000 ft. each; one of these would be used for the purpose of preparing vegetables, and the other for washing-up (and where also a portion of the vegetable cooking would be effected).

In connection with the kitchen, bakery, and stores departments, it would be desirable for large asylums to provide an apartment for the special purpose of testing the food and other supplies, whether these be obtained from the asylum farm or workrooms, or from contractors outside. These are always weighed or counted, and, in passing through the storerooms would be subjected to some examination; but it would be of some advantage that there should be a special testing-room where samples would be kept and records made as to the condition and quality of all food and materials supplied to the institution. The position of the room for the use of the testing official might advantageously be near either the stores or kitchen.

It may be noted that the kitchen department of an asylum affords some special opportunities for a violent

patient (should he obtain access, or inadvertently as a worker be permitted to enter) to obtain formidable weapons. Therefore pokers, brooms, brushes, shovels, and many other articles require to be locked up in closets; a lump of coal, forks and knives, have all to be looked after by the officials, who know very often that these things may be hidden by one patient for the express purpose of either inflicting future injury on some other inmate or for suicide. Even when all possible care has been observed in the above respect, yet patients contrive to make clubs, or secrete stones, etc., and many require to have their clothing constantly searched. It has been suggested that even the walks in the asylum grounds should be all laid with asphalt so as to avoid loose stones; but except in those asylums almost exclusively occupied by criminal and violent patients, such an expensive precaution for the whole of a large asylum is perhaps inadvisable.

There is less prospect of this danger of violence by patients in the kitchens and laundries of asylums than in the patients' wards, where means of locking up dangerous articles must be arranged for by the architect.

A medical authority has stated that patients in asylums never (or seldom) use for purposes of violence anything not in the nature of a club or stick, and that knives and cutting instruments are commonly used by suicidal patients against themselves, not others.

In some asylums, smaller kitchens are provided in

addition to those belonging to the general administration department. This has sometimes been necessary by reason of the extension of the wards of the institution beyond the capabilities of its administration buildings, or perhaps as an adjunct of buildings intended only for the reception of quiet, working, and chronic patients.

In an asylum of moderate size the bread-baking and cooking apparatus may be included in one range within the kitchen, and the cost of a separate bake-house and adjuncts avoided; but these combination arrangements must be carefully contrived, and every detail well thought out. There is a very compact patent cooking apparatus for boiling, roasting, stewing, broiling, steaming, baking bread and pastry, etc., which will also supply hot water for baths, lavatories, and laundries for large numbers, all with a single fire; the special advantages of this apparatus (which is manufactured by Messrs. Benham & Sons, Limited, of Wigmore-street, W.) are, remarkable economy of fuel, simplicity of management, perfect control, and great external coolness. Messrs. Clements, Jeakes & Co. of 51, Great Russell Street, W.C. have made quite a speciality of asylum cooking apparatus, both by gas and coal; as also have Messrs. Moorwood, Sons and Company, of Sheffield.

As with sane persons, a fair variety of food is beneficial to asylum patients. It is not easy to vary the rations for a large number of persons; but the manner of cooking may be regularly varied so as to

avoid sameness. But this variety cannot be obtainable unless the architect provides for suitable and convenient ranges, and the appliances proper for an asylum kitchen, where, it should be remembered, something like 600 lb. of meat, 200 lb. of fat, and 1,800 lb. of starchy matter, bread, potatoes, etc., have to be cooked or prepared (every day) for an asylum where there are 1,000 ordinary working patients, exclusive of the food specially required for the officers of the institution. Of course, the idle and the infirm patients require less food, say 6 oz. of meat and fat, and 18 oz. or 20 oz. of bread, potatoes, etc., per day.

It is not well to depend, to a great extent, upon the published plans and descriptions of asylums; an accurate knowledge of the multifarious requisites for such buildings can best be obtained by visiting some of the best and some of the worst asylums in the company of unprejudiced attendants or officials; the disputes and discussions that have been carried on for years among authorities and experts as to the size an asylum should attain, point to the fact that seldom should an excess above 1,000 patients be provided for in one institution. It is, however, still the practice to erect asylums of twice that capacity, and architects have recently prepared plans for two or three new asylums, each of which is intended for 2,000 patients.

Throughout the curable stage of their disease, insane paupers are very frequently retained in work-houses to save the expense of their maintenance in the public asylum. While so detained they receive

frequently, neither the correct medical treatment nor the right supply of nourishment. Effectually to treat a pauper lunatic in a workhouse would, for want of the organized system and all the appliances belonging to an establishment built and maintained with the sole view to such a purpose, cost more than the charge payable to a county asylum for the care of him. Patients retained thus in the workhouse during the first weeks of lunacy, are said not to show a fair percentage of recoveries, but, becoming worse, are sent when the possibility of a perfect cure is at an end, to an asylum, and become for the rest of their lives a permanent or occasional charge upon the rates.

The want of thoroughly good asylums (apart from county asylums for paupers) in which afflicted persons belonging to the middle classes may promptly receive the best treatment at a moderate charge, was met some forty years since by the Society of Friends, who erected a "Retreat" near York, this institution has long held a foremost place in the history of the amending of the insane, and for its time, was one of the best institutions in the land; not only was it self-supporting, but yielded a surplus which was devoted to the increase of its power to do good, the payment demanded were proportionate to the means of those for whom admission was sought.

This example appears to indicate that self-supporting, good, well appointed middle class asylums are possible, and that it is not a necessity that heavy

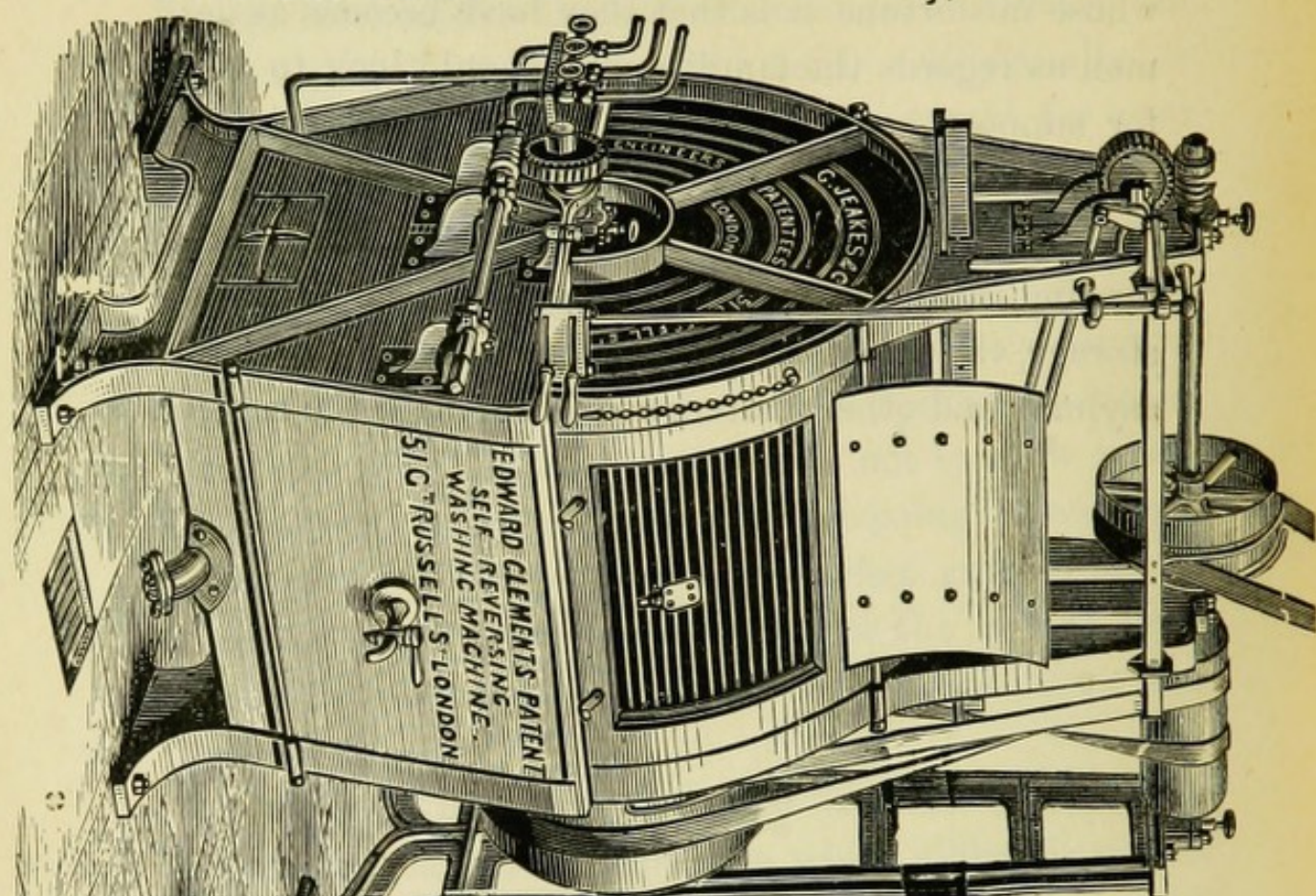
charges should be imposed upon the means of those whose misfortune it is that they have become as dead men as regards the families who should look to them for support.

It is my present intention to issue a further volume dealing specially with the subjects of ventilation, heating, laundry work, cooking, drainage, rainwater storage, the fittings, locks and furnishings suitable for asylums and other matters connected with the subject.

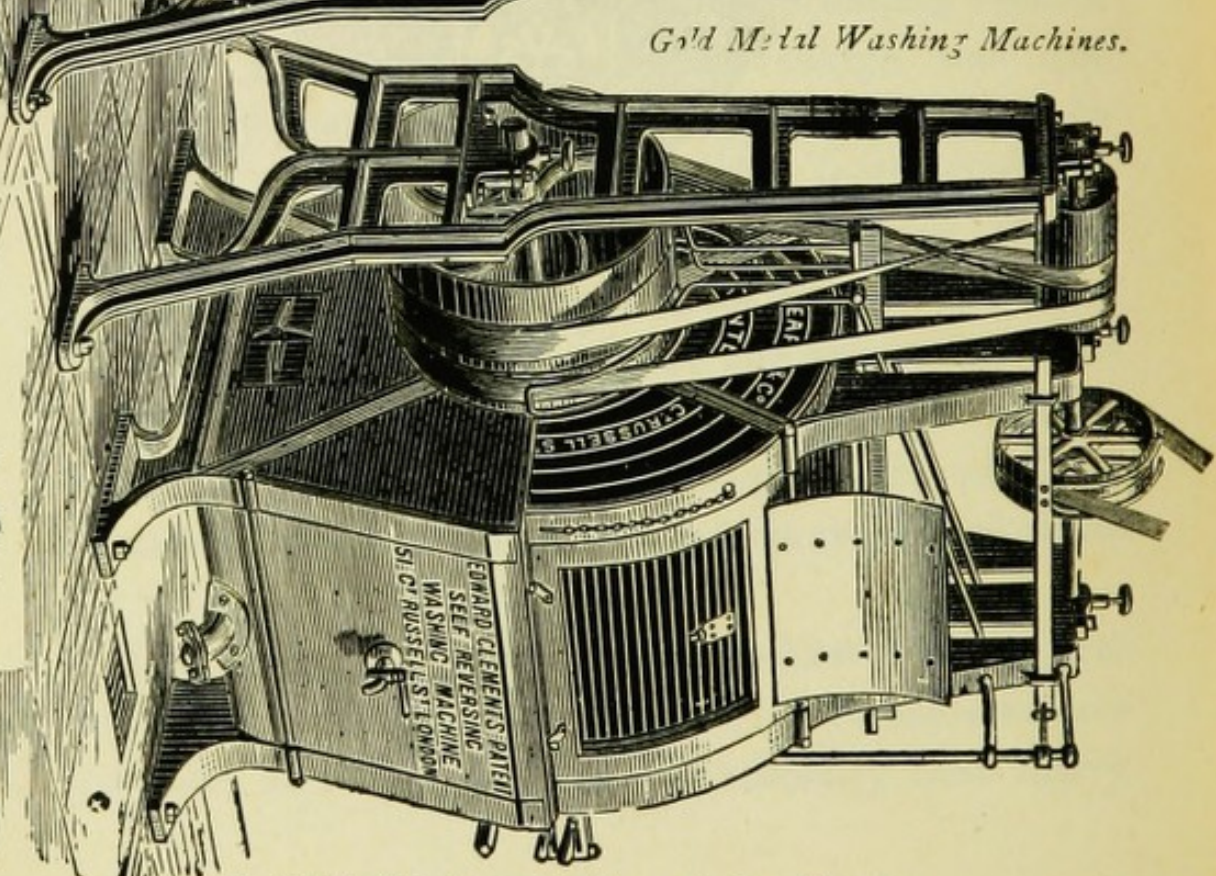


CLEMENTS, JEAKES & Co., Domestic Engineers,

51, Great Russell Street, Bloomsbury, LONDON.



Gold Medal Washing Machines.



Gold Medal Washing Machines, 6 feet diameter.

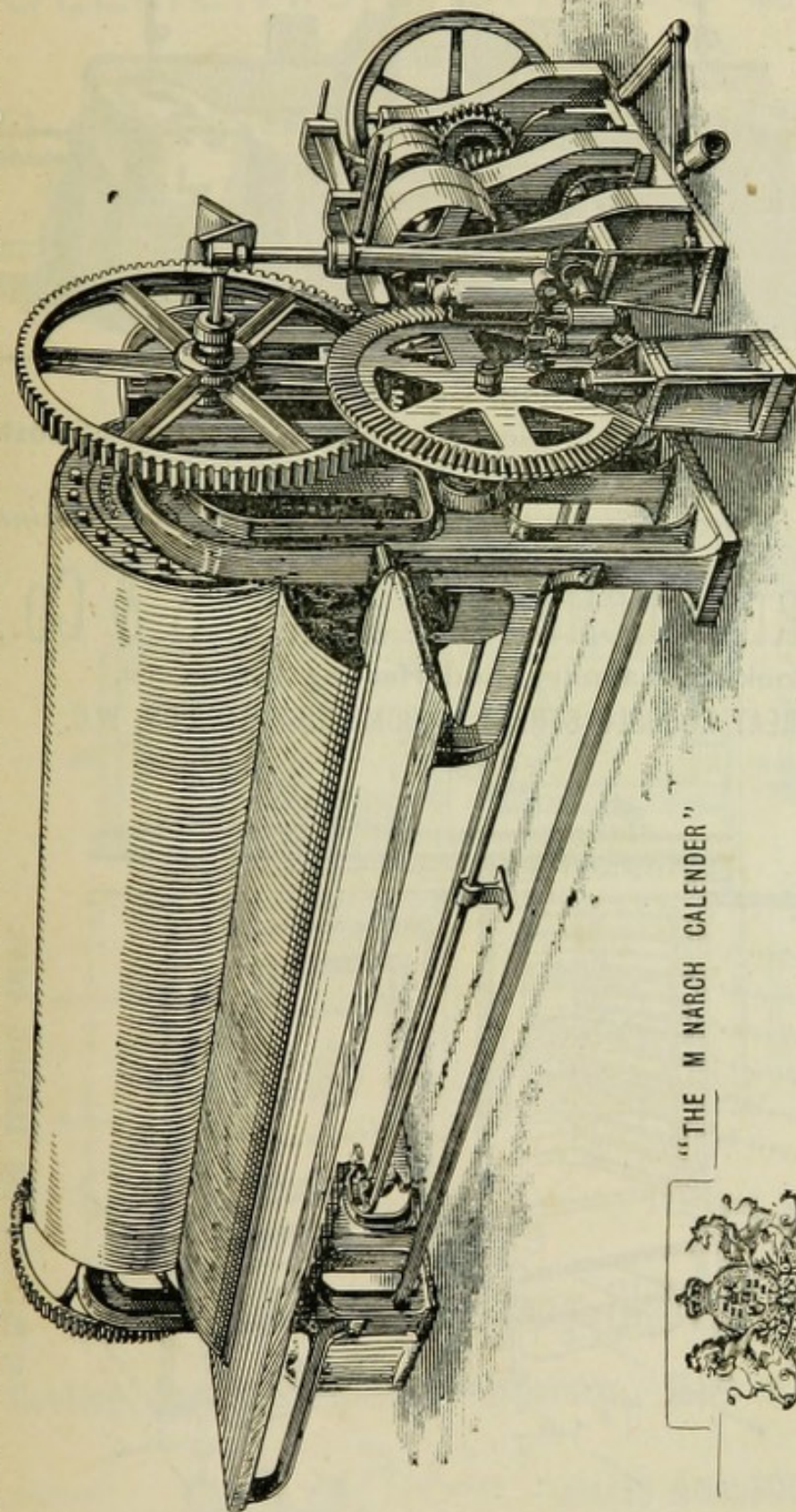
For Hospitals, Asylums, Infirmarys, Workhouses, &c.

By Royal



Letters Patent

New Improved Ironing Machine, Steam Heated Roller, with a Steam Heated Bed, Roller 111 in. long, the largest Machine made.



"THE MONARCH CALENDER"



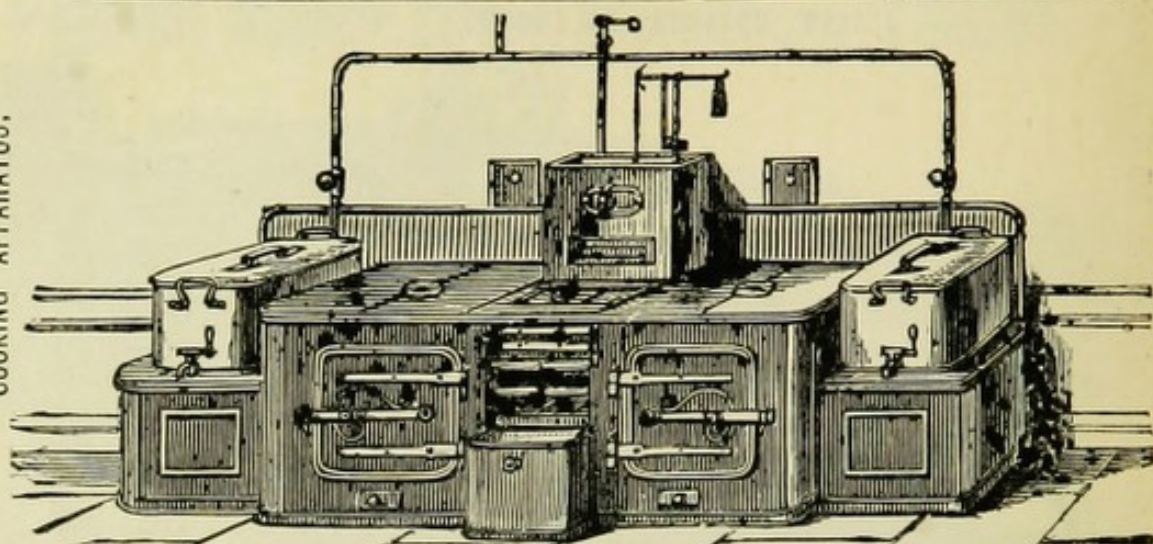
JEAKES' MONARCH CALENDER.

JEAKES' MONARCH CALENDER.

CLEMENTS, JEAKES & CO.'S IMPROVED NEW CALENDER,

51, GREAT RUSSELL STREET, BLOOMSBURY, LONDON, LAUNDRY, COOKING AND WARMING ENGINEERS.

COOKING APPARATUS.



COOKING APPARATUS.

Roasting, Baking, Boiling, Steaming.

Plans for Cooking, Laundries, Warming, set out free of cost.

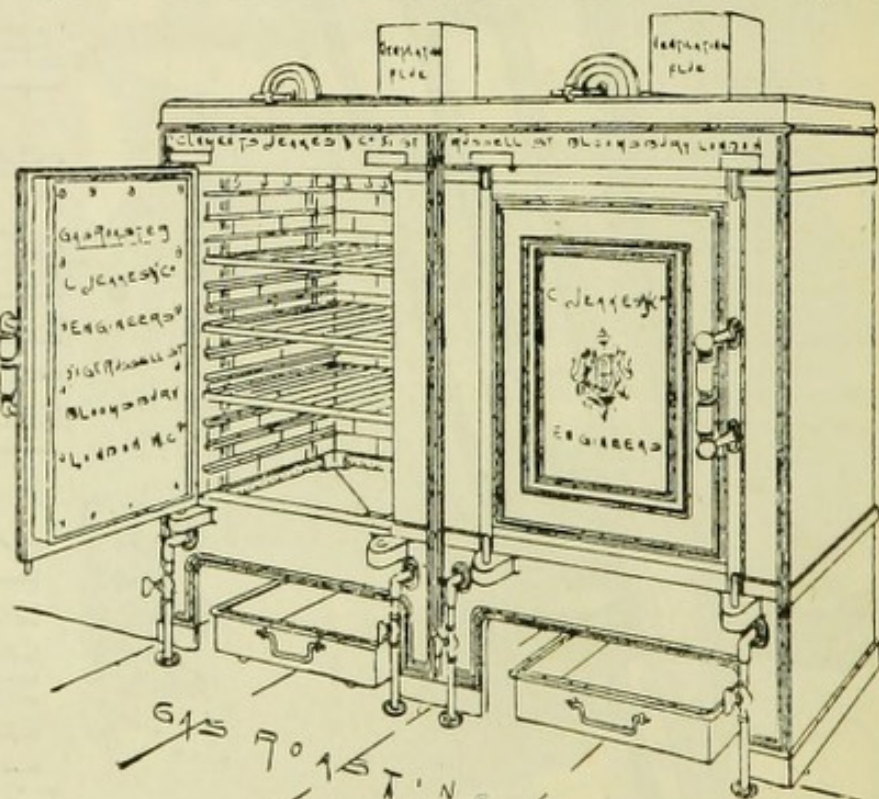
For Hospitals, Workhouses, Asylums, Infirmarys, &c.

Will wash cleaner, at less cost and less time than any other Machine.

EDWARD CLEMENTS, JEAKES & Co.,

Cooking, Laundry, and Heating Engineers,
51, GREAT RUSSELL STREET, BLOOMSBURY, LONDON, W.C.

COOKING APPARATUS, STOVES, RANGES.

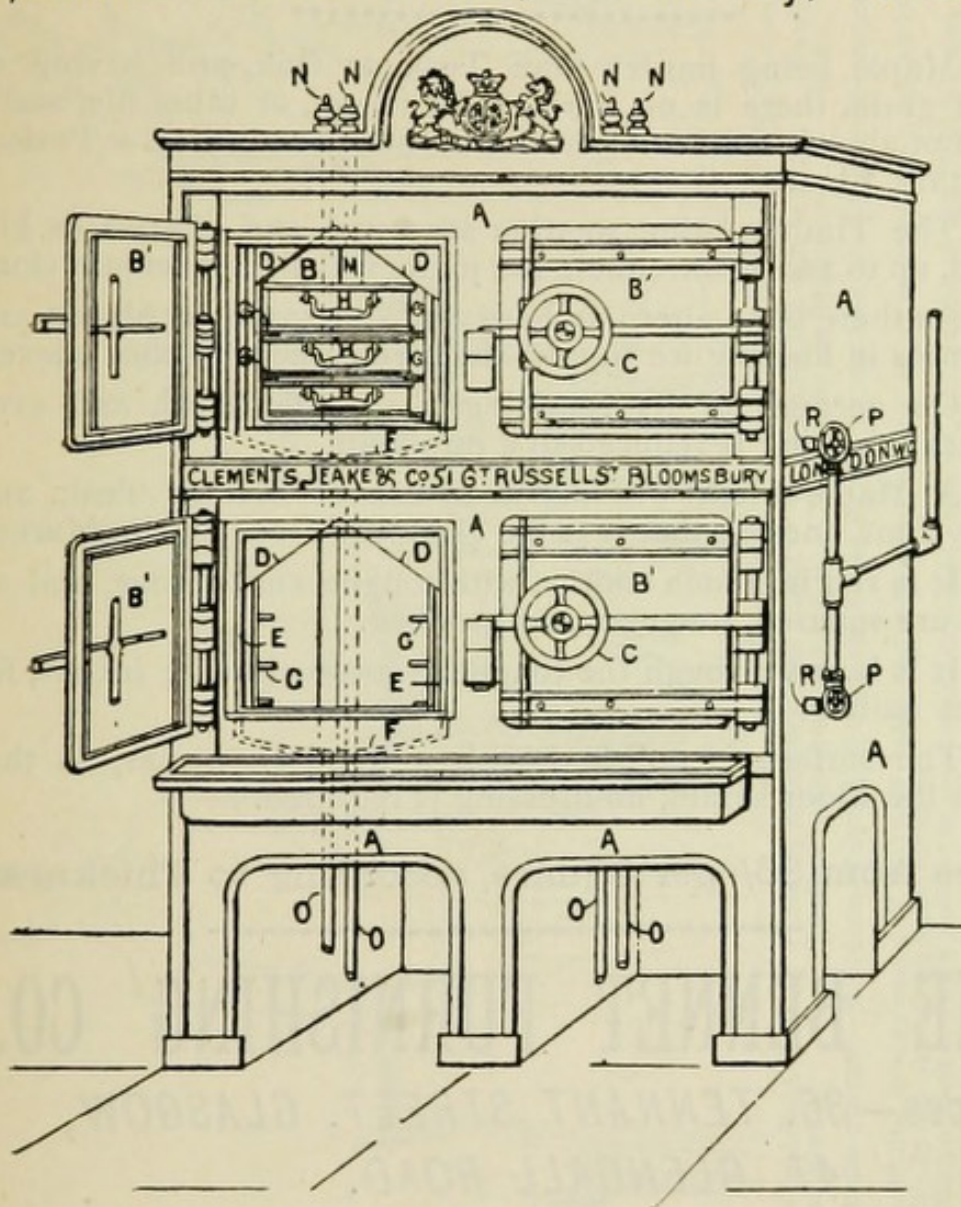


KITCHENERS, GAS ROASTING OVENS.

Gas Roasters for Hospitals, Workhouses, Asylums, Infirmarys.

CLEMENTS, JEAKES & Co.,

DOMESTIC ENGINEERS,
51, Great Russell Street, Bloomsbury, LONDON.



Potato Steaming Closet.

Cooking Apparatus, Laundry Apparatus, Warming Apparatus.

Letters



Patent "JEAKES & SAUNDERS' PATENT."

MAPLE FLOORS

An Ideal Floor for Hospitals, Asylums,
Workhouses, and Public Buildings.

.....

Maple being harder than Teak or Oak, and having no open grain, there is no harbour for insect, or other life, and it will not absorb nor retain moisture, thus constituting a Perfect, Sanitary Floor.

The Timber being weather seasoned, and afterwards kiln dried, up to 120° Fahrenheit, the joints will always remain close.

As there is no alternate hard and soft grain in Maple, and no knots in flooring we supply, the surface never wears uneven.

On account of its retaining a smooth, hard, and even surface, cleaning is reduced to a minimum.

A Maple Floor will out-wear two of Oak or Teak, and many Pine ones, so that it is the cheapest Floor on the Market.

It is run in 3 inch widths, with tongue and groove, and all ends are squared, tongued, and grooved.

It is bored through the tongue at intervals of 4 inches, for secret nailing.

The surface is polished with a wood burnisher, so that when the Floor is laid, no dressing is required.

Price from 36/- per Square, according to Thickness.

THE BENNET FURNISHING CO.,

*Offices—36, TENNANT STREET, GLASGOW,
47, GLENGALL ROAD,
OLD KENT ROAD, LONDON.*

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*Works—ST. ROLLOX, GLASGOW,  
LADYWELL, GLASGOW,  
PECKHAM, LONDON, and CANADA.*



# THE " BENNET " FOLDING TABLE

For WORKHOUSES, ASYLUMS, &c.

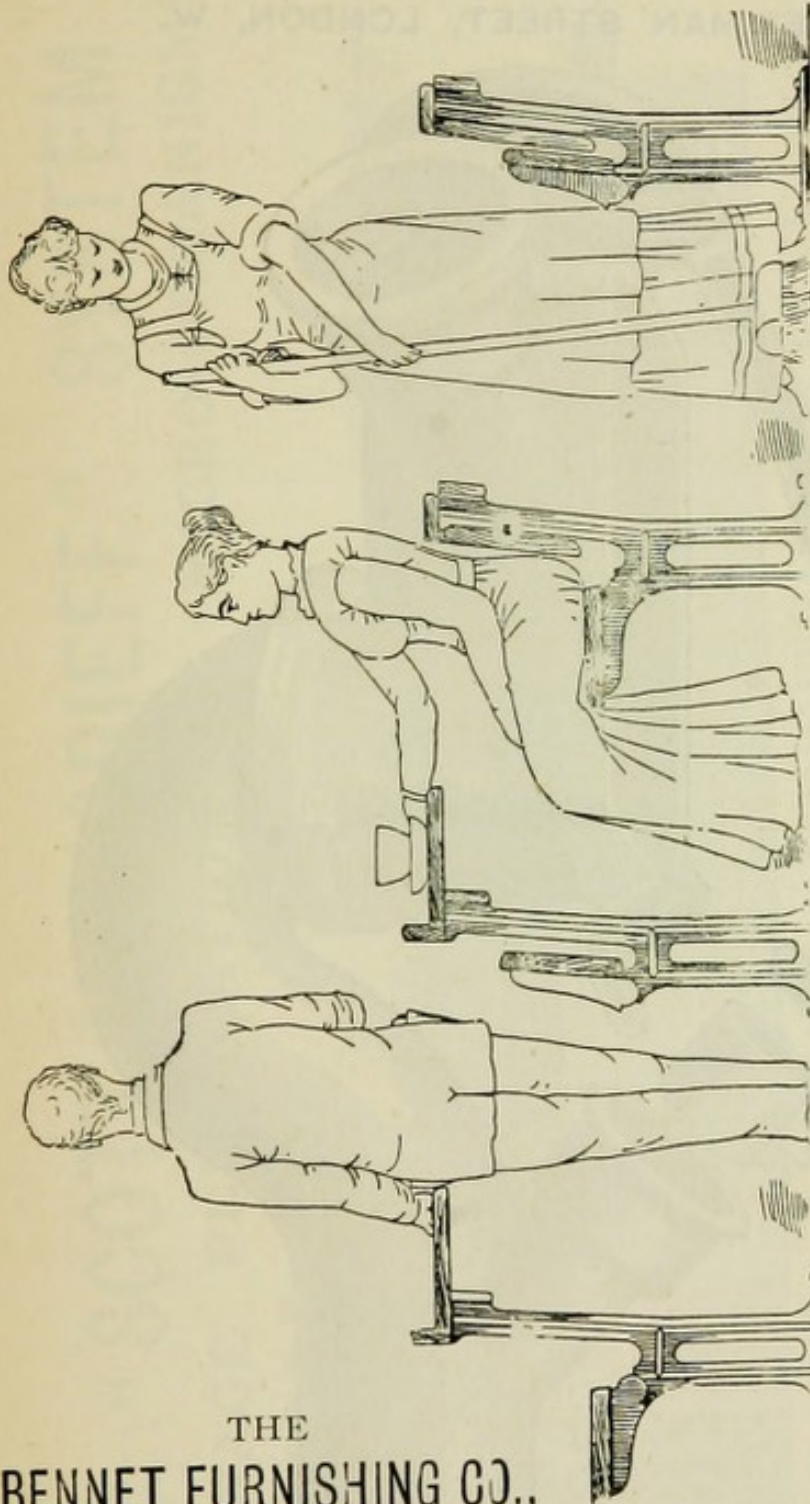


Table and Seat set for dining. Table and Seat set for cleaning. Table folded and Seat set for service or entertainment. Tables can be set at 2 ft. 3 in. centres, allowing ample room for dining or other uses. By the folding arrangement of Seat and Table, the floor can be cleaned with perfect ease, and all sides of Seat and Table can be scrubbed with no inconvenience. The folding of Seat not only assists the ingress and egress of patients, but admits of the Tables being set or cleared by attendants with the least amount of trouble. When the Tables are folded, the Seats are then available for service or entertainment, being roomy and comfortable, and the patients can take and leave their places with the least amount of confusion or inconvenience.

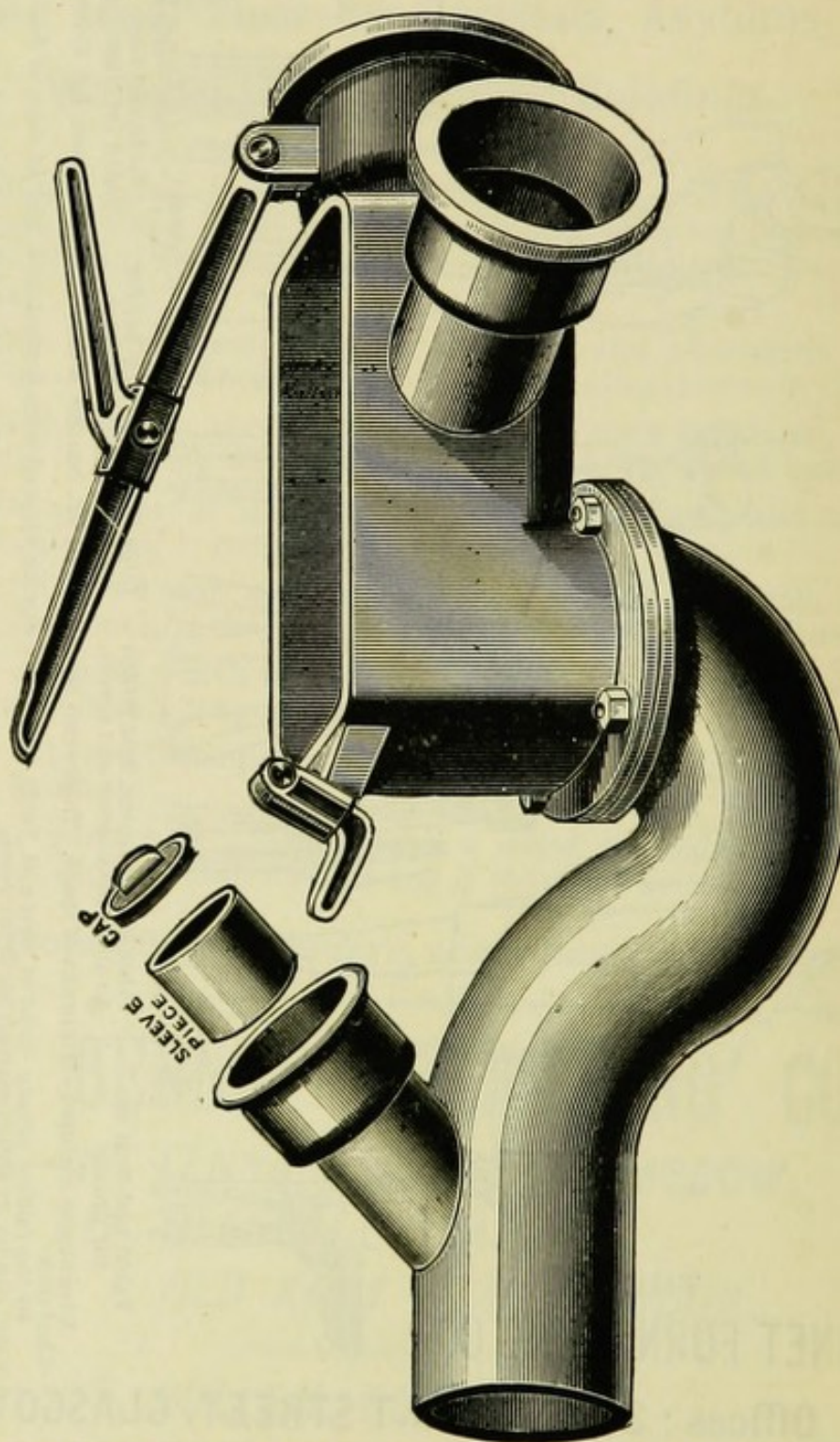
**PRICE 3/- PER FOOT RUN.**

THE  
BENNET FURNISHING CO.,

Offices : 36, TENNANT STREET, GLASGOW,  
47, GLENGALL ROAD. OLD KENT ROAD LONDON.



**NORTH BRITISH PLUMBING COMPANY,**  
86, NEWMAN STREET, LONDON, W.

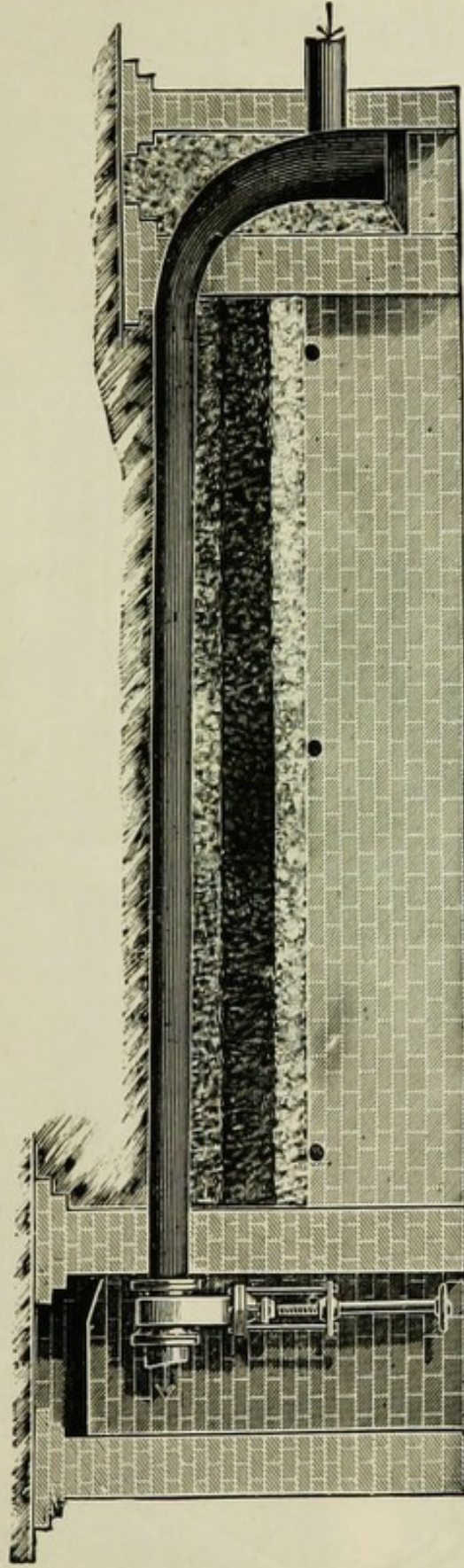


**COMPLETE SYSTEM OF CAST IRON HOUSE  
DRAINAGE.**

**FULL PARTICULARS ON APPLICATION.**



THE "SCOTT-MONCRIEFF" SYSTEM  
OF SEWAGE PURIFICATION BY MICRO-ORGANISMS.



"CULTIVATION" TANK, LONGITUDINAL ELEVATION.

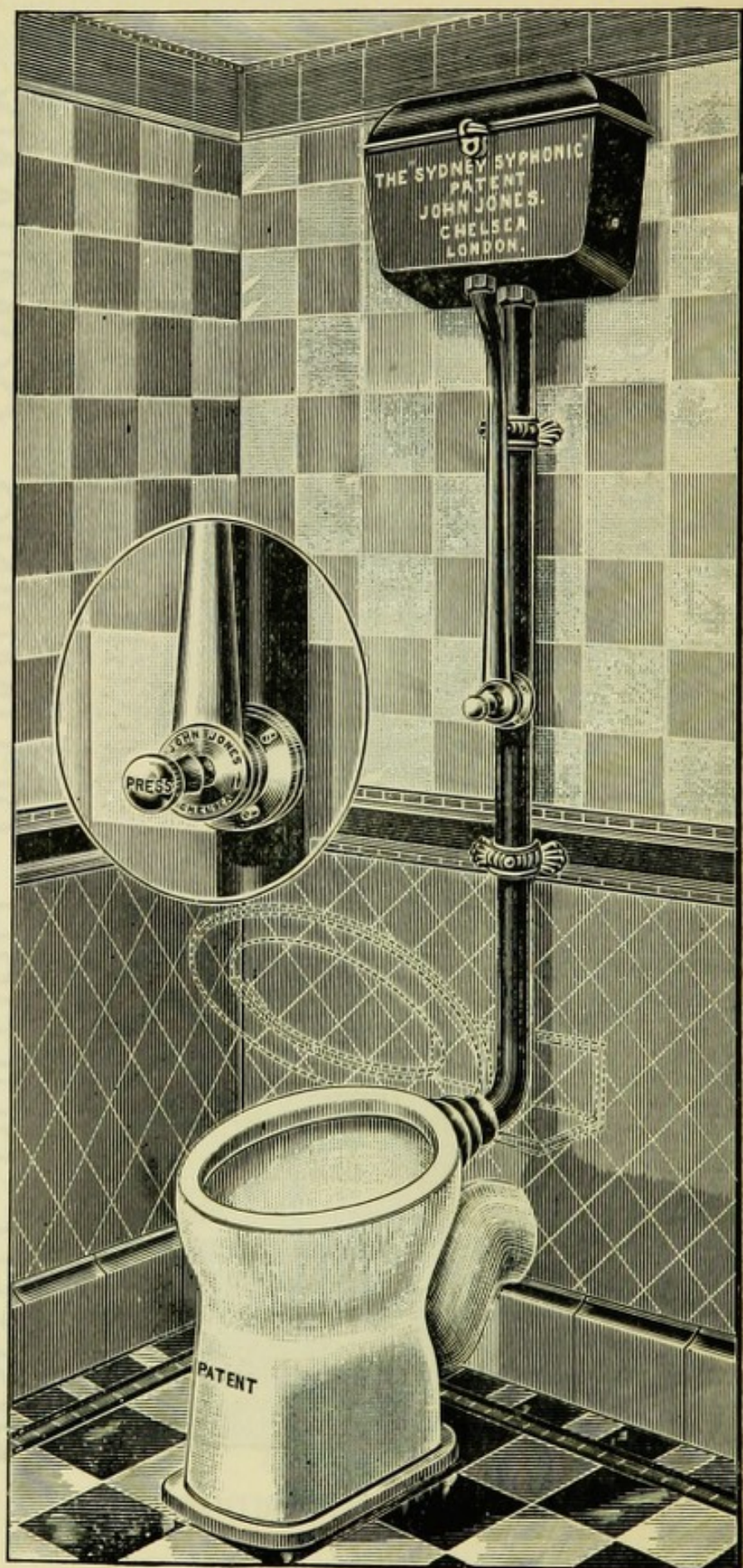
FULL PARTICULARS TO BE OBTAINED FROM THE

NORTH BRITISH PLUMBING COMPANY,  
86, NEWMAN STREET, LONDON, W.



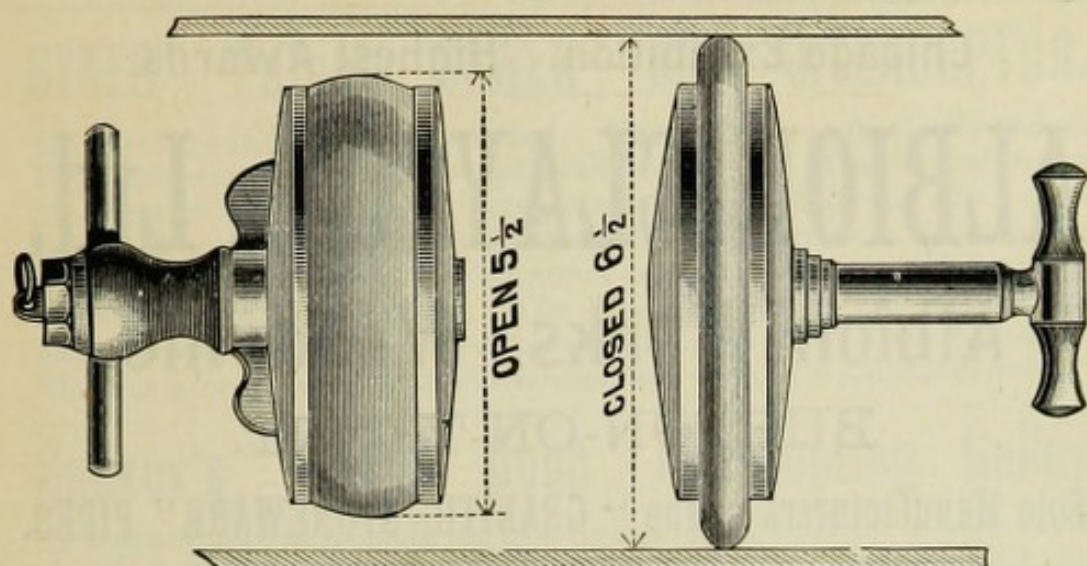
## JONES' PATENT "SYDNEY SYPHONIC" CISTERN AND ENGLISH MADE CLOSET.

The Cistern is on entirely new lines to anything hitherto brought out. The action is absolutely certain, and simplicity itself. They are being largely used in Lunatic Asylums, &c. Made Square and Angular. The Closet is a perfect Wash-down, and when used in connection with the "Sydney Syphonic" Cistern, has a clearing power equal to many Syphonic Closets. Catalogue giving full Particulars of JOHN JONES, Patentee and Manufacturer of Sanitary Specialities.

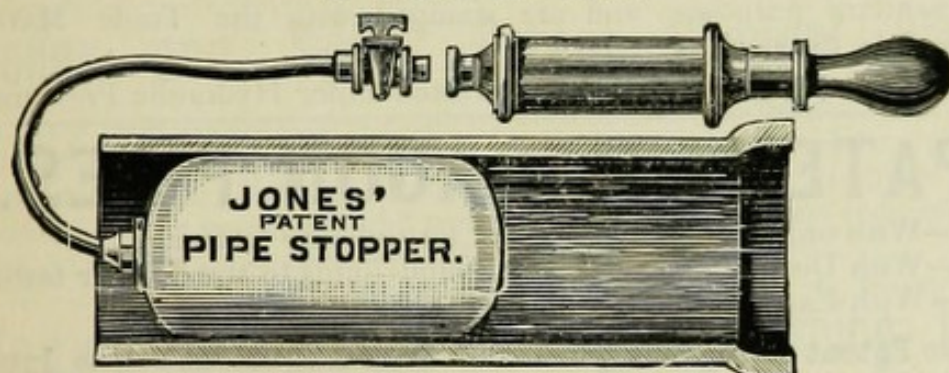




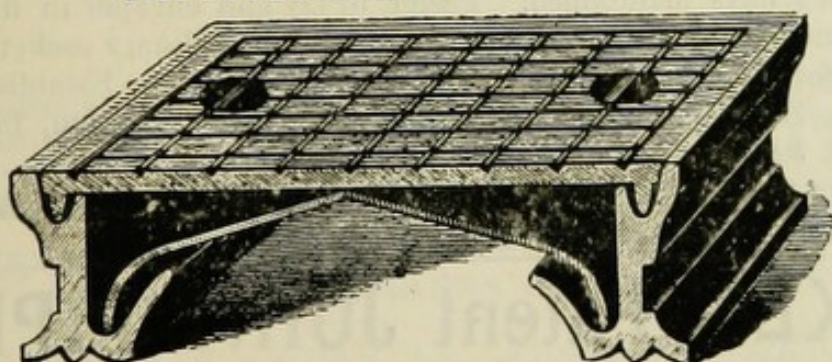
## JONES' PATENT SCREW EXPANDING DRAIN STOPPER.



## JONES' PATENT BAG DRAIN & PIPE STOPPER.



## JONES' PATENT AUTOMATIC SEAL MANHOLE COVER.



HEAD OFFICE :

40, Sydney Street, Fulham Road, Chelsea, S.W.

GENERAL OFFICES AND WAREHOUSE :

Bury Street, Fulham Road, Chelsea, S.W.

WORKS :

Selah Place and Leader Street, Chelsea, S.W.

PARTICULARS of all above on APPLICATION.



Chicago Exhibition. Highest Awards.

# ALBION CLAY CO., Ltd.

Albion Works, Woodville,  
BURTON-ON-TRENT.

Sole Manufacturers of the "GRANITIC STONEWARE" PIPES.

All the "Granitic Stoneware" Pipes are made from our "Stoneware" Clays (not fire clay). They are Non-absorbent, having a hard, dense, impervious, and imperishable body specially adapted for Sanitary purposes, and are stamped with the Trade Mark—"Granitic Stoneware."

**TESTED PIPES.** Selected and Tested under Hydraulic Pressure.

## PATENT PARAGON PIPES.

- A—With ordinary depth of socket for ordinary Drainage.
- B—With Deep Sockets to make Sound Joints to stand water tests.
- C—With Extra Deep Sockets for the best class of work.

The Patent Paragon Pipes secure true alignment of the Invert of the Joints and a Firm Rest. They remedy the defects of the ordinary socket pipes, and avoid silting and stoppage of drains. No liability of the spigots dropping. The full capacity of the sewers and drains is always maintained. Easier to lay and cheaper in first cost and maintenance than any others. Superseding ordinary socket pipes.

Used for the new drainage of Smedley's Hydropathic Establishment, Matlock, Derbyshire; Royal Opera House, Covent Garden, London; Asylums, &c., &c.

Always Specify in full—"PATENT PARAGON PIPES," A, B, or C, according to the kind required.

## SYKES' Patent JOINT PIPES.

Specially adapted for Sewers in Waterlogged ground. Sound Joints made when entirely submerged. The Screw Joints secure true alignment of the pipes. It forms a compound or Triple Safety Joint. The Patent Jointing Material for these pipes is imperishable, and yields for a time to any settlement in bad ground, and gradually sets extremely hard. It cannot enter the pipes and cause obstruction therein as in grouting. Bends and Junctions are easily inserted.

Moderate in Cost, Easy to Lay, and the most reliable of any for bad waterlogged ground.



## SYKES' Patent SEWER GAS INTERCEPTOR.

No open channel to become choked. The chamber is absolutely sealed. Far more effectual than old system, and costs less. The Patent screw Stoppers in the Inspection Inlets cannot be forced out, but can be removed at convenience for cleansing or testing the drains. By confining the sewage to the Interceptor it cannot escape to permeate the subsoil or brickwork of the manhole. The concentration of all parts in the chamber where they are easily accessible gives full control over the system. Made in 4-inch, 6-in., and 9-inch sizes, and with or without side inlets.

## Sankey's Patent Deep Intercepting Gully.

It is practically impossible for this Gully to untrap in the driest weather owing to the great depth of water above the outlet. It is provided with a specially constructed Perforated Galvanised Iron Bucket, which collects all detritus, and is easily removed without untrapping the drains. Made in all sizes, with kerbs, &c.

## Jones and Sykes' Patent Channel Bends.

A great improvement over ordinary channels for Inspection Chambers. Designed to prevent the splashing which occurs where ordinary channel bends are used. Sewage discharged through ordinary channels is deposited on the benchings and walls of the chamber, where it decomposes and generates foul gases, seriously detrimental to health.

## Keith's Patent Water-Testing & Flushing Trap.

Specially designed to provide a simple and convenient mode of testing drain and soil pipes by water and for flushing. It is simple in construction, thoroughly efficient and reliable in action, and moderate in price.

Syphons, Gullies, Interceptors, &c., with the Patent Paragon Sockets which secure a true alignment of the Invert at the Joints, thereby preventing any check to the flush in forcing solids through the traps.

INVERT, JUNCTION, & GULLY BLOCKS. STREET GULLIES.  
TO ANY SIZE. LATRINES, CLOSETS, SINKS, &c.,

*FOR PRICES, &c., APPLY TO THE*

**ALBION CLAY CO., Limited,  
Woodville,  
Burton-on-Trent.**

CHIEF LONDON OFFICE :

**18, New Bridge Street, E. C.**



# ASPHALTES.

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## PILKINGTON & CO.

ESTABLISHED 1838.

*Patentees of the System of Covering Flat Roofs  
with Asphalte and Jelt.*

**ROOFS LAID ON THIS SYSTEM GUARANTEED FOR TEN YEARS.**

The following are some of the Institutions where this  
system has been adopted, viz. :

Glamorganshire Asylum, at Bridgend ; Gloucestershire Asylum,  
at Gloucester ; Kent County Asylum, at Chartham ; Monmouth  
Asylum, at Abergavenny ; Somersetshire Asylum, at Cotford ;  
Suffolk Asylum, at Woodbridge.\*

\* Part only of these Roofs.

St. Thomas' Hospital, London ; Small Pox Hospital,  
Stockwell ; Fever Hospital, Stockwell ; Homerton Union ;  
Woolwich Union ; Eye Union, Suffolk ; St. Olave's, Bermond-  
sey Union ; National Safe Deposit, London ; London and  
County Bank, Brompton Road, W. ; National Provincial Bank,  
Bristol ; West of England Bank, Weston-super-Mare ; West  
of England Bank, Pontypridd ; Liverpool, London and Globe  
Insurance Company, Bristol ; County Militia Stores, Devizes.

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Registered Trade Mark

## Polonceau Asphalte

Manufactured only by PILKINGTON & CO. Specially suitable  
or Damp Courses, both horizontal and vertical, and for Pavings  
for all purposes where under cover.

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## SEYSSSEL ASPHALTE

For Pavings for Terraces, and all exposed places ; also for  
Damp Courses, &c., &c.

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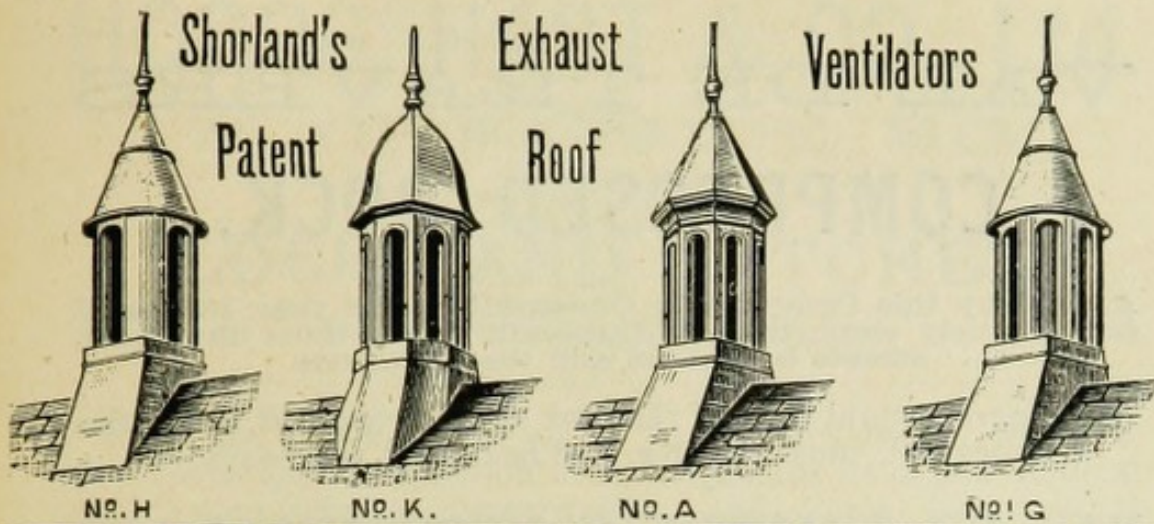
Quotations and all Particulars on application to

**Head Offices : MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.**

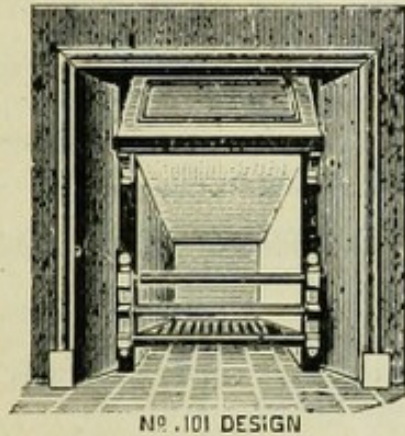
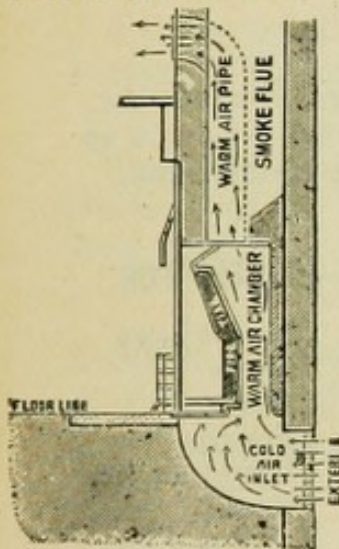
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Telegraphic Address, "POLONCEAU, LONDON."





**SHORLAND'S PATENT WARM AIR VENTILATING MANCHESTER GRATE**  
WITH IMPROVED PROJECTING BACK.



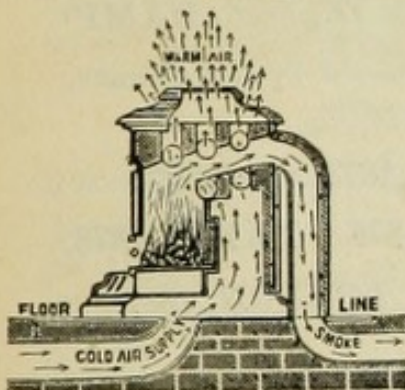
Thousands in use in  
Asylums, Hospitals,  
Schools, &c. throughout  
the Kingdom.

Catalogue, Estimates,  
&c. free on application.

Telegraphic Address—  
"WARMING, MANCHESTER."

National Telephone  
No. 2188.

Shorland's Patent Open  
Fire Manchester Stove,  
with ascending or  
descending Smoke Flue.



**E. H. SHORLAND & BROTHER,**

*Warming and Ventilating Engineers,*

**DRAKE ST. WORKS, STRETFORD ROAD, MANCHESTER.**



# VAL DE TRAVERS COMPRESSED ROCK.

As laid by this Company in Cheapside in the year 1870, and continuously since then in Hundreds of the most important streets in London and the Provinces.

Is the pure natural rock of the Val de Travers, and forms the cheapest, most durable, and healthiest roadways.

## VAL DE TRAVERS COMPRESSED ROCK FOR FOOTWAYS.

As laid in Cheapside, Poultry, Moorgate Street, Strand, &c. and most London parishes, and in many provincial towns, is as durable as flagging, and far more agreeable to pedestrians.

### VAL DE TRAVERS MASTIC ASPHALTE IS SPECIALLY ADAPTED FOR

|               |                   |              |                |
|---------------|-------------------|--------------|----------------|
| Stables       | Granaries         | Brew Houses  | Malt Floors    |
| Roofings      | Railway Platforms | Basements    | Barns          |
| Coach Houses  | Cow Houses        | Drying Sheds | Docks          |
| Aqueducts     | Warehouse Floors  | Wharves      | Aquaria        |
| Skating Rinks | Tanks             | Reservoirs   | Laundries, &c. |
|               | Slaughterhouses   | Lavatories   |                |

It is **FIRE-PROOF** (as proved by the City Engineer), **DAMP-PROOF**, and **VERMIN-PROOF**, and unaffected by any Climate.

**MEDALS AWARDED: VIENNA, 1873 and 1880;**  
**BRUSSELS, 1876; PHILADELPHIA, 1876; PARIS, 1878;**  
**BERLIN, 1883; AMSTERDAM, 1883; LONDON, 1884.**

ALL INFORMATION SENT POST FREE ON APPLICATION TO THE

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LONDON, E.C.



# HOBBS, HART & CO., Ltd.

76, CHEAPSIDE, E.C.

MANUFACTURERS OF

## LOCKS AND LATCHES

For all Classes of Security.

From the very initiation of the Asylum Scheme, H. H. & Co have given special attention to the requirements of the Medical and Administrative Departments, and know from actual experience every approved regulation.

A competent representative will be sent to confer with Architects desirous of Specifying our Manufactures.

The following is a selection from the County Asylums and Unions, where H. H. & Co.'s Locks and Fastenings have been used.

### UNIONS.

Ashton-under-Lyne, Chelsea and Kensington, City of London (Homerton), Croydon, Hackney, Highgate, Homerton, Isle of Thanet, Kensington, Lewisham, New Casual Wards, Chelsea, Romford, Rotherhithe, Saint Pancras, Shoreditch, Southport, Westminster and Poland Street, &c.

### COUNTY ASYLUMS.

Abergavenny, Bansted, Caterham, Chartham, Darenth, Devon, Dorchester, Eastern Counties, Fareham, Glamorgan, 1st and 2nd Gloucester, Haywards Heath, Holloway Sanatorium, Leicester, Northampton, Norwich, Prestwich, Suffolk, Sussex, Whittingham.

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ISLINGTON, N.



# K'S LOCKS

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JOSEPH KAYE & SONS, LIMITED,

MAKE EVERY KIND OF

**LOCK & FASTENING**

FOR

**ASYLUMS,**

INCLUDING LOCKS FOR DOORS, SHUTTERS,  
WINDOWS, KNIFE BOXES, CUPBOARDS, &c.

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Estimates given, and Samples submitted for  
refitting Asylums.

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KAYE & SONS have for many years given special attention to the requirements in Locks for Asylum Purposes, and would refer Medical Officers, Architects, &c. to the following Asylums, viz.: Wadsley, near Sheffield, Menston, near Leeds, and Wakefield.

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WORKS: HUNSLET, LEEDS,

AND

77A, GT. QUEEN ST., LONDON, W.C.

(During re-building of 93, High Holborn.)

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KAYE & SONS make Patent Locks, Bolts, Latches and Handles for every kind of Door, Desk, Drawer, Cupboard, etc., including Railway Carriage and Brougham Locks, Cart and Railway Waggon Doors, all of which have great advantages over all others. Also Patent Exit Fittings for doors that open outwards, and for doors that open both ways, which are approved of by the London County Council.



# BAKERS' OVENS

## ADVANTAGES.

Greater Economy. A Better Bloom.  
 Greater Durability. Greater Regularity of Heat.  
 Greater Regularity. Perfect Control over Temperature.  
 Greater Cleanliness. Absolutely Continuous Baking.  
 Less Loss of Heat During Baking.

## COMBINED BAKERS' & CONFECTIONERS' OVENS.

These are on same principle as Bakers' Ovens, but so arranged that with the same fire the several decks can at one time be worked at the same or any different temperatures for various classes of goods.

Messrs. Cox & Son,  
 4, Victoria Parade,  
 Torquay.

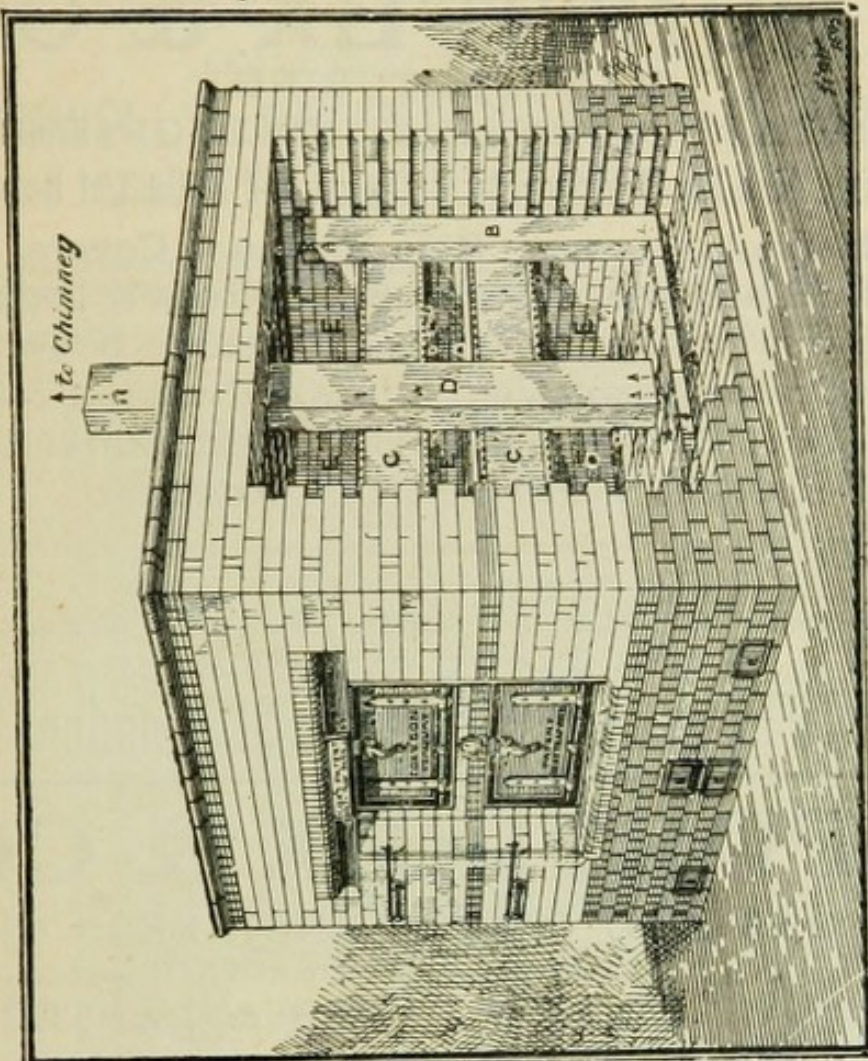
Meaby's Reading Biscuit Factory  
 Reading,  
 November, 5th, 1894.

Gentlemen,—In reply to your enquiry we are glad to say that the Double-Deck Oven (each 10 ft. by 8 ft.) you erected for us last April is doing excellent work, in fact we wish for nothing better.

It is always ready for work, absolutely continuous, under perfect control, the two Ovens working at the same time at different temperatures; they are also extremely economical in fuel.—Yours faithfully

(Signed) MEABY & CO., Ltd.,  
 GLOYL J. CARTER, Secretary.

Made in any Size or Shape, and with 1, 2, or 3 Decks.



Ovens may be had with Iron or Tile Floors.

**COX & SON, PATENTEES AND SOLE MANUFACTURERS, TORQUAY.**

Apply, stating size required and if for Bread only or Mixed Goods, to



# S. PONTIFEX & CO.

MANUFACTURING,

SANITARY & VENTILATING ENGINEERS.

Galvanized Iron Bins for Storage of Gravel and Ballast at Roadside.

Manhole Covers. Side Entrance Covers.

Circular Lamphole Covers. Sewer Rods & Fittings.

Sewer Trolleys. Cast-Iron Flushing Boxes.

Gulley Grates. Sewer Ventilators & Flushing Valves.

CAST-IRON STANDPOSTS, STREET HYDRANTS AND DELIVERY HOSE.

*Cast and Enamelled Iron Name Plates.*

Street Orderly Bins. Galvanized Wrought-Iron Tanks, Cisterns, &c.  
Shovels, Picks, Pails.

PROMPT DELIVERY AT LOWEST MARKET PRICES.

ESTIMATES ON APPLICATION.

S. PONTIFEX & Co., 22, Coleman St., London, E.C.

# S. PONTIFEX & CO.

GAS AND WATER ENGINEERS.

Manufacturers of and Contractors for the Maintenance of  
**PUBLIC LAMPS & LANTERNS;**  
Glass—Flint, Opal, & Bent in Stock, & cut to sizes.

WELL LAMPS, STREET NAME TABLETS,

Lamp Columns, Head Irons, Puttyless Lamps,

LANTERNS, COCKS, REGULATORS.

**Improved High-Power Lanterns**

FOR

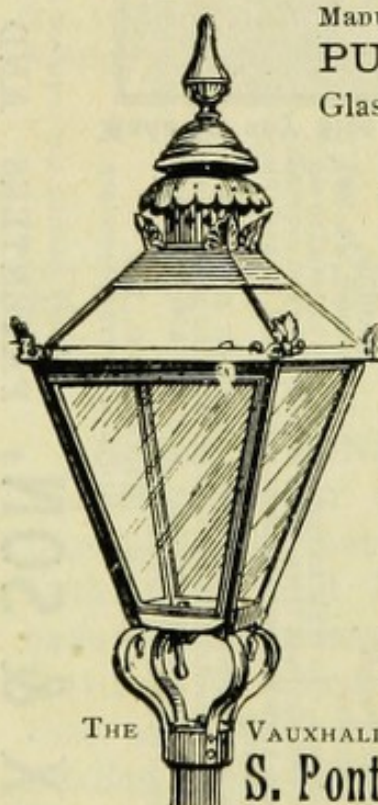
Lighting Street Refuges & Open Spaces.

**BROWN'S PATENT LAMPLIGHTERS' TORCHES.**

Proprietors and Manufacturers of

*Box's Patent Puttyless Street Lamp.*

This Lamp may be supplied fitted with clear, opal or ribbed glass, as also with enamel tops, if required. The necessary fittings for altering existing Lamps to this system can be supplied at moderate prices.



THE VAUXHALL

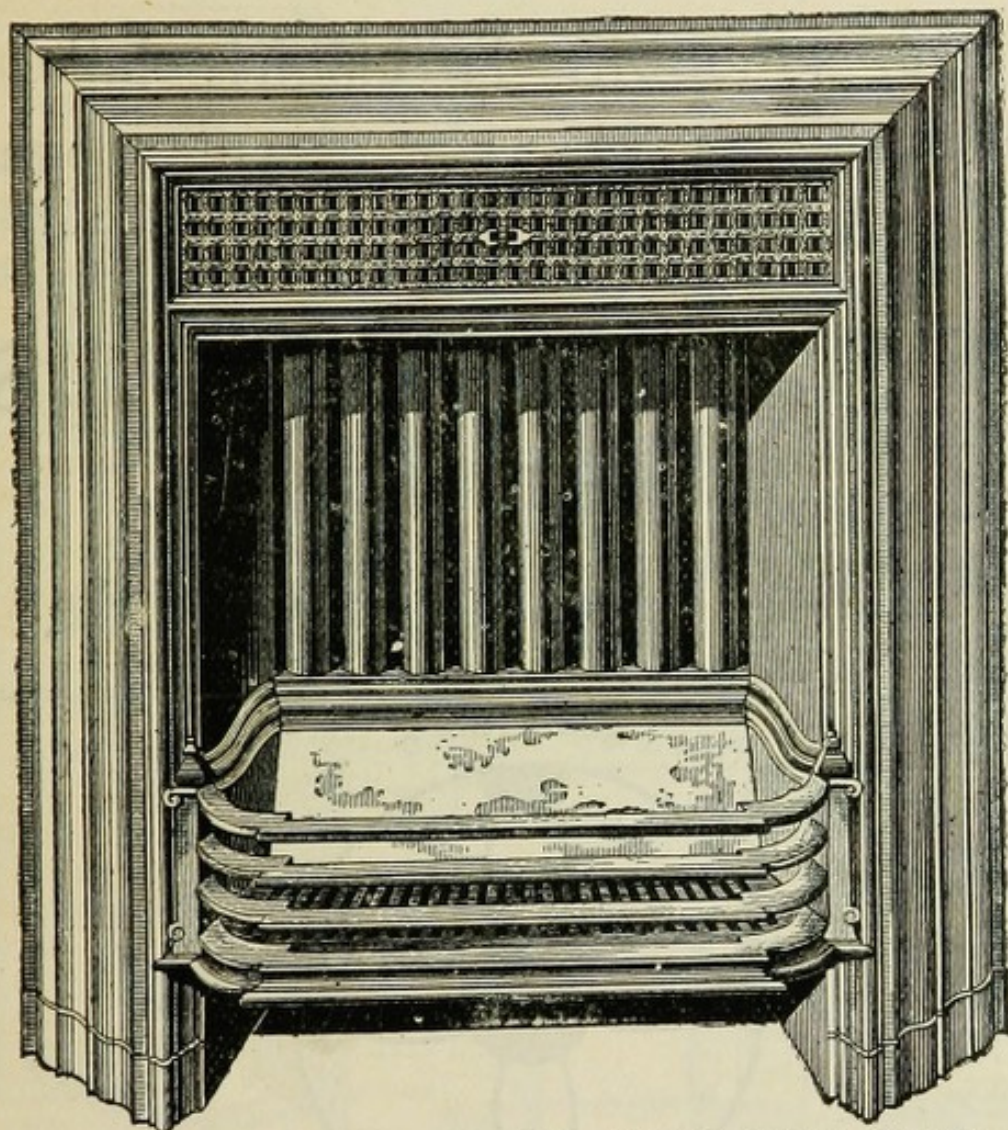
S. Pontifex & Co., 22, Coleman St., London.

MANUFACTORY: 2, EDWARD STREET, HAMPSTEAD ROAD, W.



# THE COALBROOKDALE CO., LD.

MANUFACTURERS OF  
WHITWELL'S PATENT "SAVE ALL WASTE"  
VENTILATING GRATE.



FOR SCHOOLS, HOSPITALS, ASYLUMS, PUBLIC ROOMS, OFFICES, &C.  
Other Designs and Patterns, Prices and Drawings on application.

## HEATING APPARATUS.

"HEAP'S" PATENT RADIATOR, for Warming & Ventilating.  
Drawings, Prices, and Copies of Recent Testimonials on Application.

WORKS: COALBROOKDALE, R.S.O. SHROPSHIRE.

TELEGRAMS, "DARBY, COALBROOKDALE."

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BLACKFRIARS, E.C.

TELEGRAMS, "SEVERNDALE, LONDON."



# HALL & BOARDMAN LIMITED,

London Office :

76, FINSBURY PAVEMENT, E.C.

Telegraphic Address, "HALL, SWADLINCOTE."

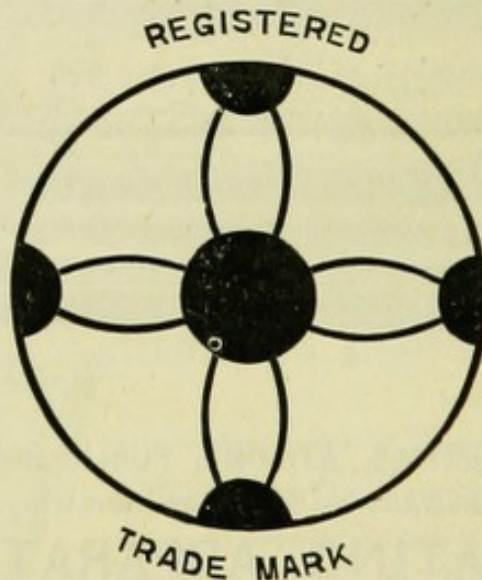
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MANUFACTURERS OF

## SEWERAGE PIPES

TESTED PIPES,  
GULLIES, INTERCEPTORS, &c.

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Swadlincote & Cadley Hill Collieries,  
NEAR BURTON-ON-TRENT.



# "THE SAMSON."

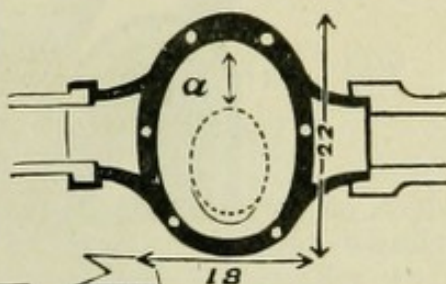
BODIN'S PATENT EXTRA-STRONG AUTOMATIC PEDESTAL  
CLOSET OR LATRINE.

NO TIPPING BUCKETS, NO MOVING PARTS.

Fig 26

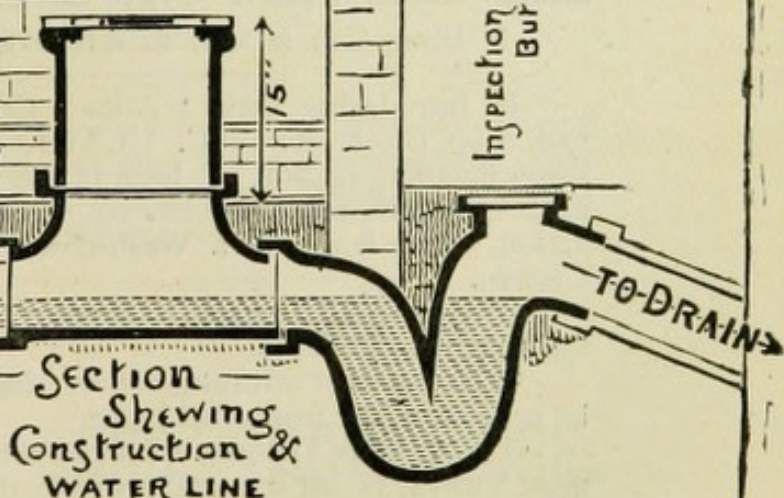
## BODIN'S PATENT AUTOMATIC FLUSHING LATRINE

- α - GIVES 7" CLEARANCE FOR SOIL



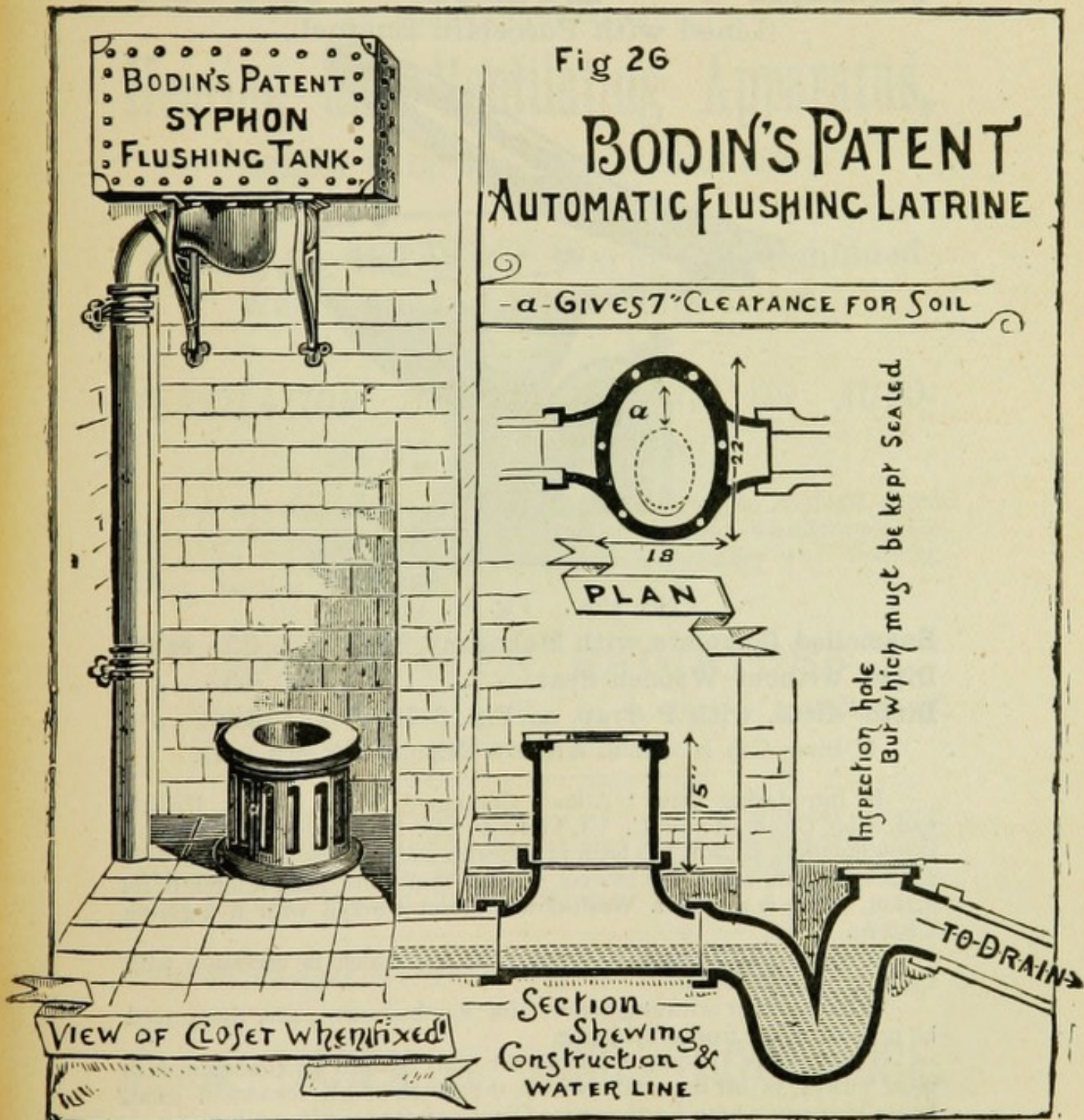
PLAN

Inspection hole  
But which must be kept sealed



Section  
Shewing  
Construction &  
WATER LINE

VIEW OF CLOSET WHEN FIXED



W. H. BODIN & CO.,

CONSULTING SANITARY SPECIALISTS,

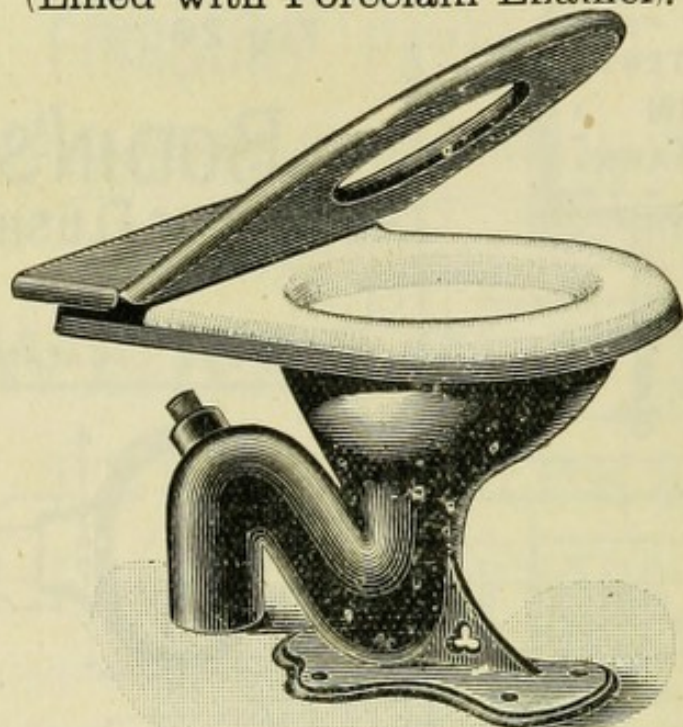
"ACME" SANITARY ENGINEERING WORKS,  
WEDNESBURY, STAFFS.



T. & C. CLARK & CO. of WOLVERHAMPTON.

# CLARK'S "ATLAS" CLOSET

(Lined with Porcelain Enamel).



No. 462c. Fig. Q. 18 $\frac{7}{8}$ .

|                                                       |        |      |       |
|-------------------------------------------------------|--------|------|-------|
| Enamelled Complete with Mahogany Seat                 | ...    | 65/- | each. |
| Ditto, without Wooden Seat                            | ... .. | 45/- | „     |
| Ditto, ditto, with P Trap, as Fig. S 18 $\frac{1}{2}$ | ...    | 43/- | „     |

If Brass Cap is sent to screw on Nipple, 1/6 each extra.

In introducing their "Atlas" Combined Water Closet, Urinal, and Slop Closet, T. & C. CLARK & CO. have every confidence in recommending it, as it has been in use with rough usage for over a year at their Works, and there has not during that time been a hitch in its action, which is that of a Wash-down Closet worked with a 2-gallon Cistern.

It requires no brackets to support the seat which is necessary with the Earthenware ones.

It has another advantage over the Earthenware ones, there need be no fear of the frost cracking it.

The "Atlas" Closet, now that the Pan System is condemned in most Towns, is just the article within the reach of all owners of small house property where Earthenware Closets so frequently get broken.

Where space is an object, for an extra 2/6 the S Trap can be put on either side of Hopper instead of at the back.

For Prison, Workhouse or Factory use they are sometimes ordered without Wood Seats, the Enamelled top being kept more easily cleaned, and as the Enamel is a non-conductor of heat, it is not so objectionable for use as may be imagined.



---

# G. N. HADEN & SONS, ENGINEERS,

MANUFACTURERS OF

## Heating and Ventilating Apparatus,

ORIGINAL PATENTEES OF THE EXPANSION JOINT.

---

Heating by Hot Water, Warm Air, Combined  
Warm Air and Water, and Steam.

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### VENTILATION BY MECHANICAL OR AUTO- MATIC ARRANGEMENTS.

All departments of Engineering works required for Asylums, fitted up in the most approved manner, including Heating, Ventilation, Hot and Cold Water Supply Hydrant Service, Laundry and Cooking Work, Engines, Pumps, &c.

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### HOT WATER RADIATORS

of Special Designs made in a large number of  
different sizes.

---

MESSRS. HADEN & SONS have been entrusted with the carrying out of all or some portion of Engineering Work at upwards of thirty Asylums in the country, including, Cane Hill, Menston, Rainhill, South Yorkshire Asylum, Rubery Asylum.

---

*Asylums inspected and reported upon. Plans and Estimates given.*

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BRANCH OFFICES—

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Manchester; and Lower Temple Street, Birmingham.



THE  
**"DELUGE ADAMANT"**

The Strongest Closet Basin made.

---

**SPECIALITY FOR ASYLUMS, &c.**

*No part less than 1 inch thick.*

**PRACTICALLY UNBREAKABLE.**

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MADE IN

Extra Strong "Cliffe Vale" Fire Clay.

Made to the requirements of the London County Council.

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CLIFFE VALE POTTERIES,  
**HANLEY.**



ESTABLISHED 1895.

**CHARLES & FRANK SMITH, Ltd.**

BIRMINGHAM LOCK WORKS, BIRMINGHAM.

(CHARLES G. and FRANK SMITH, Directors),

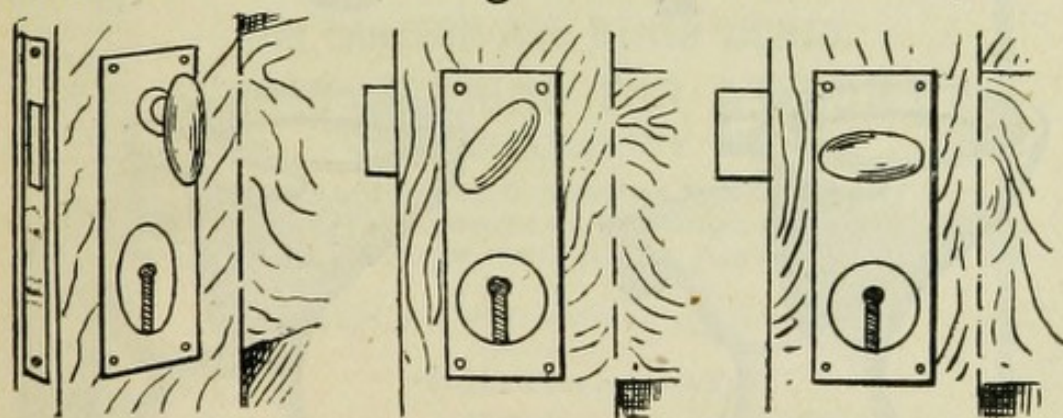
3, DENMARK STREET, LONDON, W.C.

(Late of CHARLES SMITH &amp; SONS, Established 1704),

**Specialists in Locks and Fastenings for Lunatic Asylums**

Sons of the late Mr. Charles Smith who was 50 years ago consulted and made the Locks for Rainhill Asylum, for Dr. Clayton, lately a Commissioner in Lunacy.

Makers of Locks and other fittings for Asylums under C. H. HOWELL, ESQ., Consulting Architect to the Lunacy Commissioners.

**Patent Silent Indicating Locks for Lunatic Asylums**

A Unlocked.

B Locked Once.

C Locked Twice.

Best make, heavy Steel Plates, Gun Metal Bolts and Fittings, Keyholes bushed with Steel—*en suite* to lock twice with secure Levers.

Inventors in conjunction with Dr. MOODY (London County Council Asylum, Cane Hill).

Locks for Doors, Windows, Apparatus for Fanlights and Lantern Lights, Gas and Electric Light Fittings, Wrought Iron Gates and Railings.

Iron Fire Escape Staircases, Gates and Railings, Grates and Mantels, Electric Bells and Indicators, and all kinds of Metal Fittings for Asylums.



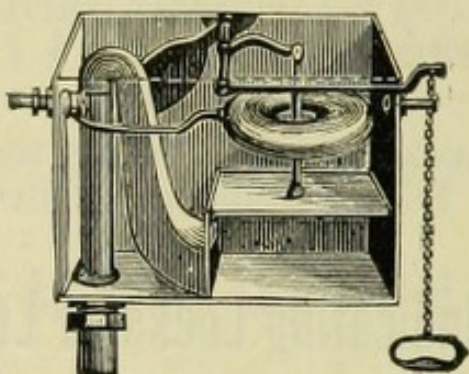
# A. EMANUEL & SONS, Limited,

SANITARY ENGINEERS,

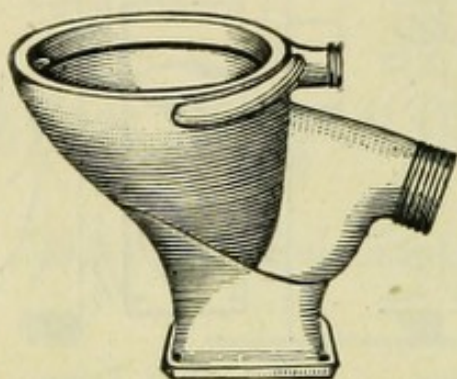
WAREHOUSE AND SHOWROOMS:

9, 11, & 13, George Street, Manchester Square,  
**LONDON, W.**

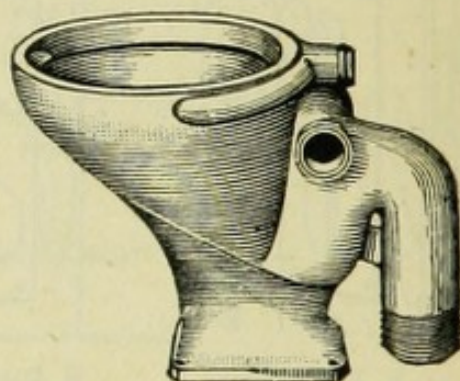
EMANUEL'S  
Patent  
Noiseless Valveless  
SYPHON  
CISTERN,



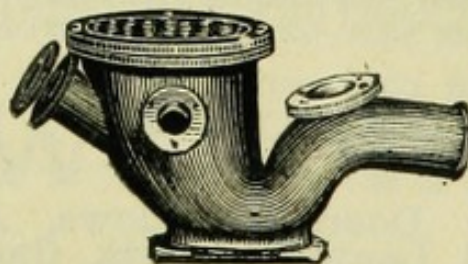
as supplied to the  
LONDON SCHOOL  
BOARD.  
Passed by all  
London Water  
Companies.



EMANUEL'S  
Meteor Washdown  
CLOSET,  
with P Trap,  
passed by the  
London C.C.  
(Registered).

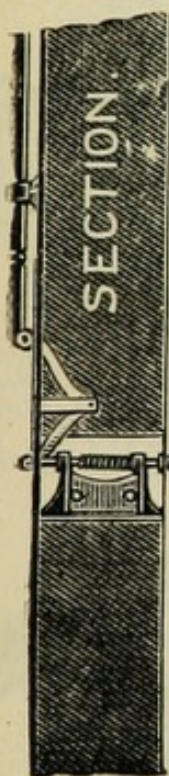
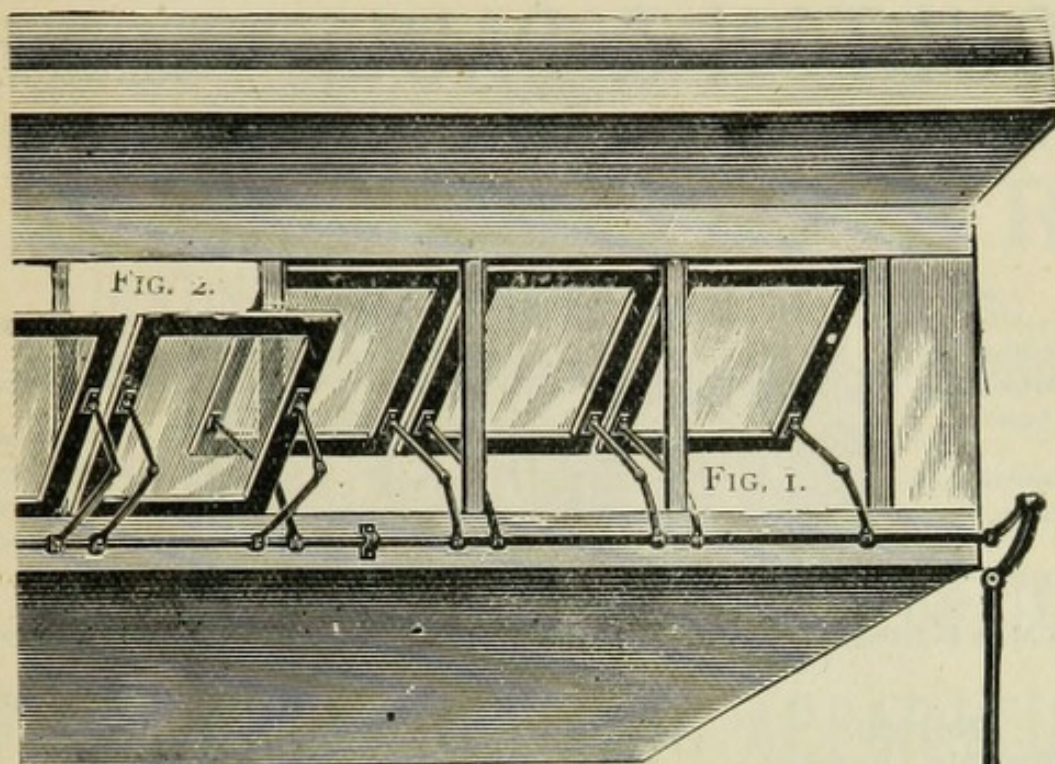


EMANUEL'S  
Meteor Washdown  
CLOSET,  
with S Trap,  
passed by the  
London C.C.  
(Registered).



EMANUEL'S Enamelled Cast  
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to H.M. Office of Works, and the  
Royal Palaces (Registered).





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# VENTILATING GEARING

FOR LANTERN AND OTHER LIGHTS.

SECRET GEARING FOR ASYLUMS  
A SPECIALITY.

As supplied and fixed at the Claybury,  
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*Drawings and Estimates on Application.*

## Testimonial.

35, Parliament Street, London, S.W.  
February 17th, 1893.

Dear Sir.—I find the Casement Opening Appa-  
ratus, which you fixed for me at the Nottingham  
and Claybury Asylums, is giving every satisfaction.  
Your system is particularly adapted for Asylums  
where a range of upper lights require to be opened  
simultaneously, and works so easily that a child  
can use it.—Yours faithfully,

(Signed) **GEORGE T. HINE,**  
Architect

Mr. George Wragge.



Gun  
Metal  
Plate  
fixed

flush with wall, covering  
the screw regulator,

SEVERAL DESIGNS OF REGULATORS CAN BE SUPPLIED.

Wrought and Cast Iron Sashes, Casements and Metal Work.

Write for Catalogues and all information to

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# BOULTON & PAUL, MANUFACTURERS, NORWICH.

PORTABLE ARTISTIC WOOD AND IRON BUILDINGS OF EVERY DESCRIPTION FOR LEASEHOLD PROPERTY.

No. 402. Galvanized Iron Hospital.

Can be inhabited the moment they are finished.

No possibility of damp.



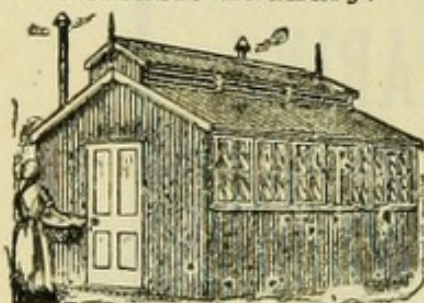
Warm in Winter.

Cool in Summer.

Gentlemen waited upon in any part of the country.

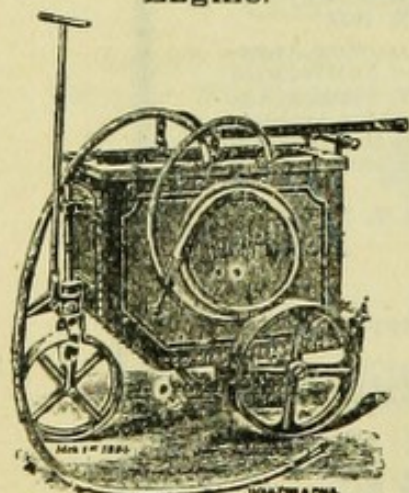
Size of Main Building, 60 ft. by 17 ft. Three Nurses' Rooms 26 ft. by 10 ft. Approximate Cash Price £250, Carriage paid and Erected.

No. 338.  
Portable Laundry.



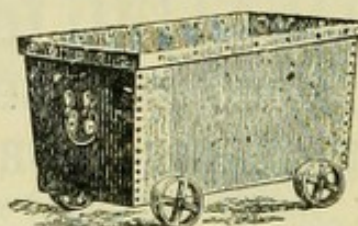
In sections ready for easy erection by Purchaser, 15 ft. long by 10 ft. wide. Cash Price, £18 10 0. Matchboard Lining, £6 0 0.

No. 86a. Garden or Fire Engine.



Cash Price, Carriage Paid, £9 15 0.

Galvanized Wrought Iron Sanitary Truck, No. 5.



24 in. by 18 in. by 18 in. deep. Cash Price, 22/6 If without wheels, 7/6 less.

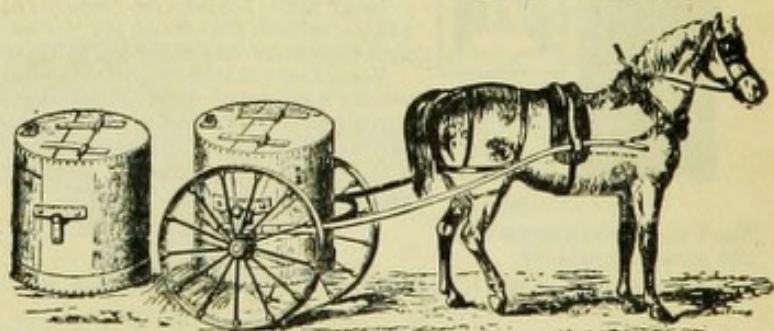
All Orders amounting to 40/- can be paid to the principal Railway Stations in England and Wales.

Improved Combination Cinder Sifter and Portable Dust Bin.



Size 2 ft. 8 ins. by 1 ft. 9 ins. by 2 ft. 1 in. deep. Cash Prices, Carriage Paid. Body of Wood, painted, £2 5 0. If Galvanized Iron, £2 15.

3. Swing Water or Liquid Manure.



Cash Price, Carriage Paid.

Cart on Steel Wheels, One Tank, to hold 100 Gallons, £7 10 0.

Cart on Steel Wheels, Two Tanks, to hold 100 Gallons each, £11 10. Valve and Spreader £1 extra.

Illustrated Catalogue free on Application.



BY HER MAJESTY'S



ROYAL LETTERS PATENT.

ESTABLISHED 1886.

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## HEATING AND VENTILATING ENGINEER, &c.,

### FAIRFIELD STREET, FAIRFIELD, LIVERPOOL.

(Telegraphic Address—"DERIDDER, LIVERPOOL.")

NEATNESS. DURABILITY.

de RIDDER'S PATENT "SMALL PIPE SAFETY."

## HOT WATER HEATING APPARATUS

For Asylums, Churches, Chapels, Schools, Mansions, Residences, Conservatories, Baths, Laundries, Drying Rooms, Manufactories and Buildings of every Description. Piping only "one inch-and-a-quarter" external diameter.

Patronized by — HER MAJESTY'S WAR OFFICE, THE LONDON SCHOOL BOARD, THE HANLEY SCHOOL BOARD, THE MERSEY DOCKS AND HARBOUR BOARD, THE LEADING LONDON AND PROVINCIAL ARCHITECTS, &c.

Approved by THE PRINCIPAL INSURANCE COMPANIES.

THIS APPARATUS consists of a continuous tube of only "one inch-and-a-quarter" diameter, a portion of which forms a Coil, and is placed in a furnace which heats the Water in the Coil, causing the Circulation. It has also a SPECIAL EXPANSION TUBE WITH SELF-ACTING VALVE, &c., which does not seal or bottle up the Apparatus, but provides amply for both the EXPANSION OF WATER AND ESCAPE OF AIR, WITHOUT LOSS OF WATER, a result hitherto thought impossible; thus my Apparatus cannot justly be called High Pressure or Dangerous.

CAUTION.—Attempted infringement necessitates notifying that "The combination of an Expansion Tube with a Safety Valve" is covered by my Patent, and can only be supplied by me.

SAFETY.—It is perfectly Safe, there being neither Boilers, Steam, Metal Plates, Cisterns to boil over or cause undue strain, nor Hermetical Sealing of the Apparatus. It can also (when desired) be charged with Non-Freezing Liquid, and can be fired any weather, regardless of Frost.

NO TWO QUALITIES OF PIPING USED. ONLY COMPETENT AND STEADY MEN EMPLOYED. NO PIECEWORK ALLOWED:

EVERY APPARATUS IS GRATUITOUSLY GUARANTEED.

ADVANTAGES.—No HERMETICAL SEALING—No CISTERN to boil over or get out of order—No BOILER—No STEAM—No CAST IRON PIPES—No BURNT AIR OR SULPHUR FUMES—"THE ONLY" SYSTEM PROVIDING FOR SILENT AND SELF-ACTING EXPANSION (without loss) OF WATER AND RELIEF OF AIR.

*Plans and Estimates Furnished Free of Charge on Application.*

Telegraphic Address—"DERIDDER, LIVERPOOL."



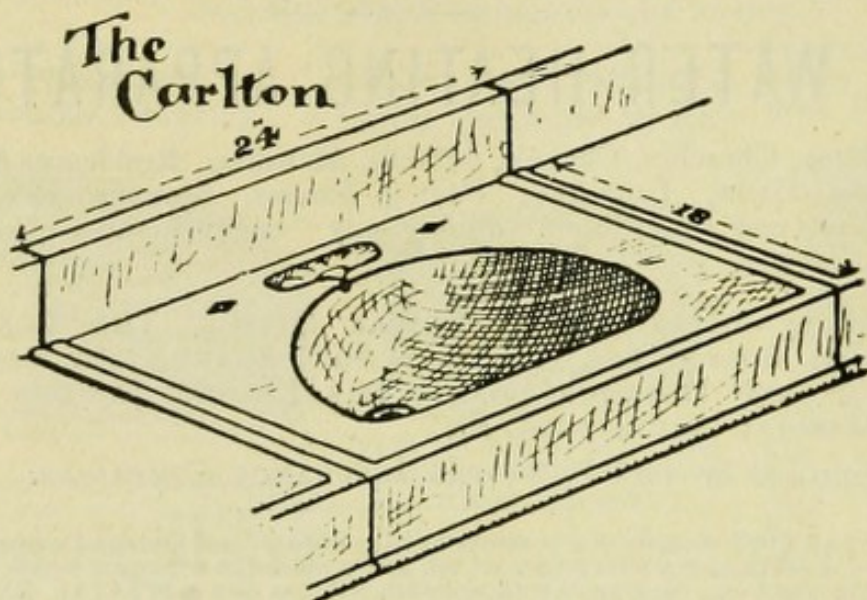
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Branch of the Leeds Fireclay Co., Ltd.,

## SPECIALITIES FOR LUNATIC ASYLUMS.

Imperial Porcelain Baths, with  
SPECIALLY STRONG Fittings.



SPECIALLY STRONG Fireclay  
Lavatories, Gulleys with Locking  
Grates, Tea Infusers, &c., as supplied  
to the Middlesex County and other  
Asylums.

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WORKS :—WORTLEY, LEEDS.



# SALT GLAZED BRICKS

SPECIALLY ADAPTED FOR

ASYLUMS

AND OTHER PUBLIC INSTITUTIONS.

*The Glaze being of the same substance as the Body of the Brick, and not, as in most Glazed Bricks, a composition dipped or washed on the surface, it cannot possibly chip or shell however badly it may be knocked about.*

SAMPLES AND PRICES ON APPLICATION.

Ordinary White and Coloured Glazed Bricks

KEPT IN STOCK.

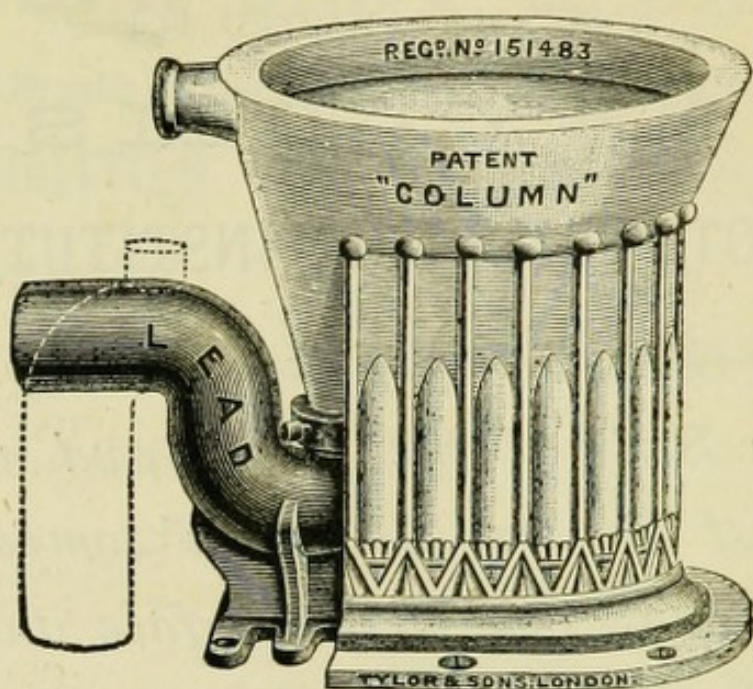
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OATES & GREEN, LTD.,

**HALIFAX.**



# PATENT "COLUMN" CLOSET, WITH LEAD TRAP.



This closet is made of best white earthenware, with lead trap to shoot either out or down. The use of a lead trap ensures the joint between the closet and soil-pipe being well made.

The lead trap is joined to the earthenware basin by a simple brass collar, as in the ordinary valve closet.

This joint between earthenware and metal—always a difficult joint to make—being *above the trap*, there is no danger of sewer gas entering the house through careless fixing.

The water stands higher than the joint; careless fixing is therefore instantly detected by the water falling on the floor.

The seat can be fixed to rest upon the earthenware.

A ventilating pipe should be carried from the top of the trap.

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**J. TYLOR & SONS, LIMITED,**  
SANITARY ENGINEERS,

2, NEWGATE STREET, LONDON, AND SYDNEY.



# STUART'S

## GRANOLITHIC STONE PAVING,

CHURCH ROW, LIMEHOUSE, LONDON.

TELEGRAMS .. .. GRANOLITH, LONDON.

### SPECIALITIES.

GRANOLITHIC Fire Resisting Floors,  
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GRANOLITHIC Corridor Pavings.

GRANOLITHIC Staircases.

GRANOLITHIC Stone Facings.

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MORNINGSIDE, Mid-  
lothian  
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&c., &c., &c.

*Plans and Estimates submitted. Enquiries invited.*

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IMPORTERS of and WORKERS in Every Variety of

## BRITISH & FOREIGN MARBLE,

Alabaster, Granite, and Stone.

ARCHITECTURAL WORK, Staircases, Balustrades, Columns,  
Reredos, Fonts, Monuments, etc.

MARBLE WALL LININGS AND PAVEMENTS at the same cost as Tiles.

CHIMNEY PIECES: the largest stock in the Country.

ARCHITECTURAL AND ECCLESIASTICAL MODELLERS AND SCULPTORS.

### ITALIAN MARBLE MOSAIC PAVEMENTS

*Laid by their own Staff of Italian Workmen.*

### MARBLE MOSAIC ADAMANT,

Is the most Durable, Artistic, and Inexpensive Floor obtainable.

MARBLE MOSAIC ADAMANT is also made in TILE for FLOORS and WALLS,  
and can be fixed by ordinary workmen. They are specially adapted for Export.

PRICES, from 7s. 6d. per Square Yard.

*Marble and Mosaic Works executed at the following important Buildings:—*

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| Truro Cathedral.—J. L. Pearson, R.A.                          | The Joint Stock Bank, Leeds.—Ambler & Bowman.           |
| Midland Railway Hotel, Bradford.—C. Trubshaw.                 | The York-hire Penny Penny Bank, Leeds.—Terkin & Bulmer. |
| St. James' Church, Bootle.—C. Hadfield.                       | The Queen's and the Royal Hotels, Cardiff.—J. P. Jones. |
| The Harris Institute, Preston.—J. Hibbert.                    | The Institute for the Blind, Birmingham.—J. A. Chaiwin. |
| The Cathedral, Manchester.—J. S. Crowther.                    | Art Gallery, Manchester.—J. Murgatroyd.                 |
| General Infirmary, Leeds.—George Corson.                      | Municipal Buildings, Shemeld.—E. W. Mountford.          |
| Nottingham Castle.—H. Walker, C.E.                            | National Portrait Gallery.—Ewan Christian               |
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DESIGNS AND ESTIMATES FREE ON APPLICATION.



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Established 1868.

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THE ONLY MEDAL AT THE INTERNATIONAL HEALTH EXHIBITION FOR  
ARTIFICIAL FLAG STONE, 1884.

THE ONLY MEDAL FOR ARTIFICIAL STONE PAVING AT THE LEICESTER EXHIBITION,  
1885.

GOLD MEDAL—INTERNATIONAL EXHIBITION, CRYSTAL PALACE, 1884.

GOLD MEDAL—BUILDING TRADES EXHIBITION, 1886.

BY APPOINTMENT TO THE HEALTH EXHIBITION, 1884.

GOLD MEDAL—INTERNATIONAL EXHIBITION, ALEXANDRA PALACE, 1885.

DIPLOMA OF HONOUR, INTERNATIONAL FISHERIES EXHIBITION, 1883.

BY APPOINTMENT TO THE ROYAL AGRICULTURAL SOCIETY

GOLD MEDAL—MINING EXHIBITION, CRYSTAL PALACE, 1890.

IT HAS BEEN USED IN THE LARGEST  
**ASYLUMS, SCHOOLS,  
AND BARRACKS**

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As PAVING it has stood the test of 27 years' traffic  
in London.

## INDURATED CONCRETE SLABS AND IN-SITU PAVING.

In view of the extension of powers under Local Government Acts to comparatively rural districts, the Company manufacture, on a large scale, cheap and useful first-class Concrete Slab Paving, and lay Paving *in-situ*, in order to meet the requirements of places where traffic is less severe, and where the first cost is of importance.

*Paving on deferred payments extending over twenty years.*

Laid on London and Tower Bridges ; the Foot Traffic on the former exceeds 120,000 Passengers per day—the heaviest traffic in the world. This Pavement will last a century in ordinary Suburban Roads.

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Works : Stratford Market Station, G.E.R. Essex,  
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GROBY QUARRIES, NEAR LEICESTER.



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Contractors to H. M. Government, War Office,  
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HARLESTON IRON WORKS,

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LONDON—9, SOUTHAMPTON STREET, HIGH HOLBORN, W.C.  
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LAUNDRY AND GENERAL ENGINEERS  
AND IRONFOUNDERS.

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Steam and Gas Cookers, Heating and Hot  
Water Appliances, Apparatus for Asylums, Work-  
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Baths and Wash-houses.

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STEAM DISINFECTORS.

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Fire Escape Staircases as sanctioned by the  
Board of Trade.

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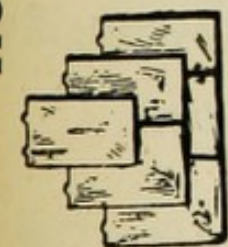
PLANS AND ESTIMATES FREE.

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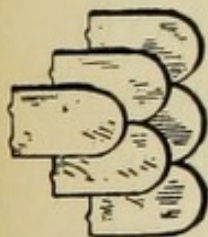
CATALOGUES ON APPLICATION.



# ROOFING AND RIDGE TILES A SPECIALITY.



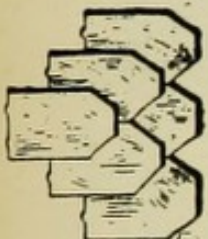
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2



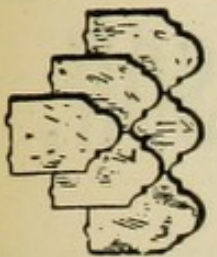
4



6



8

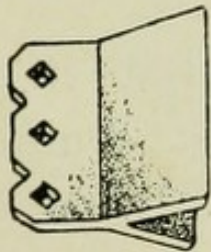
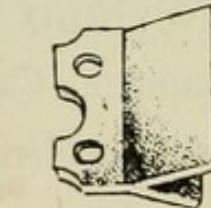
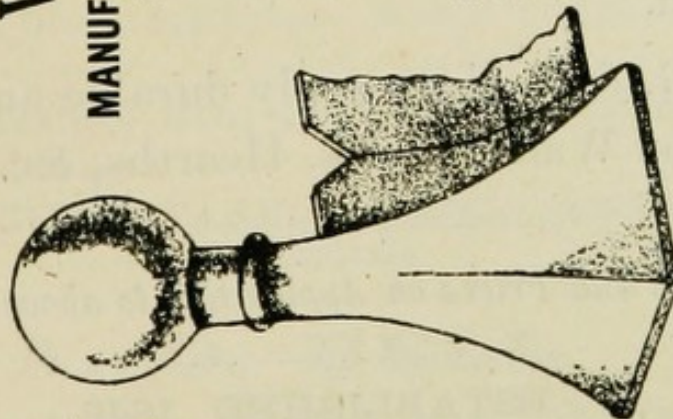


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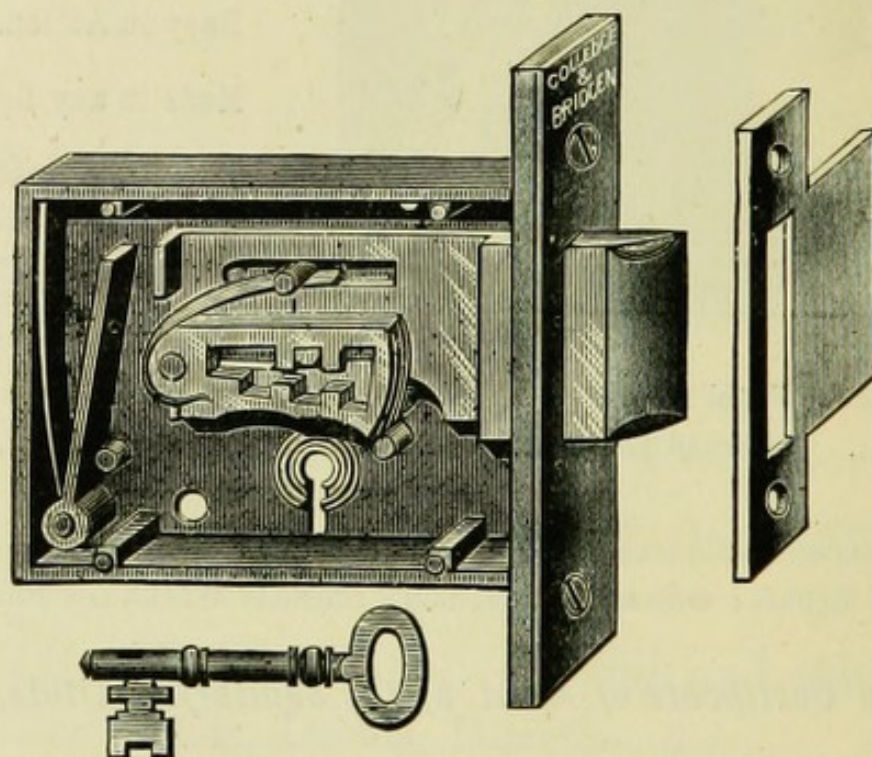
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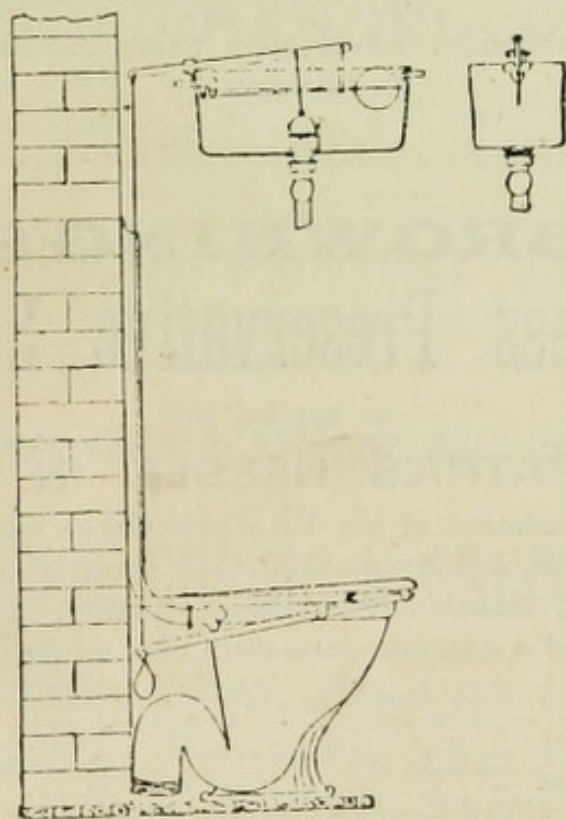


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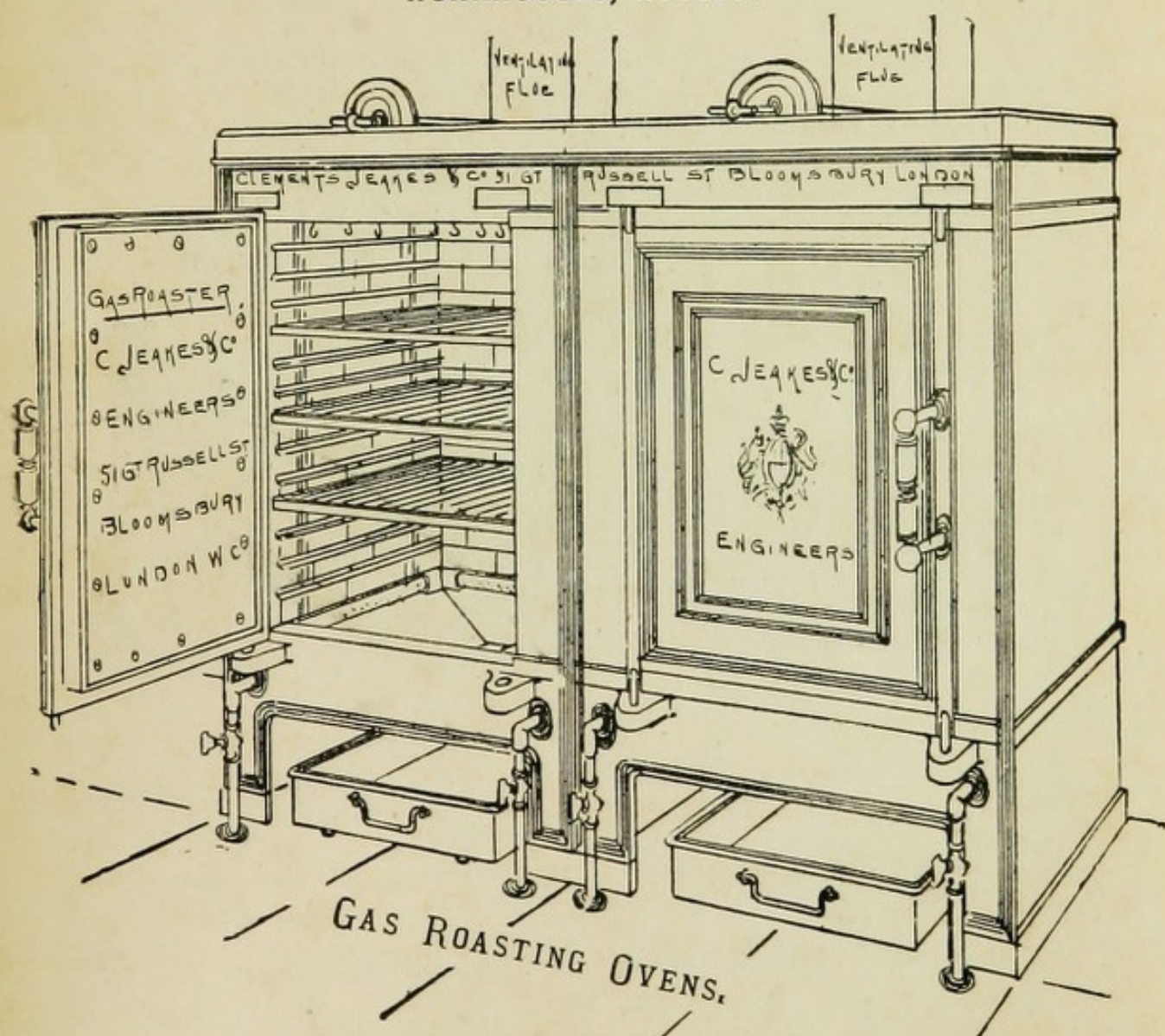
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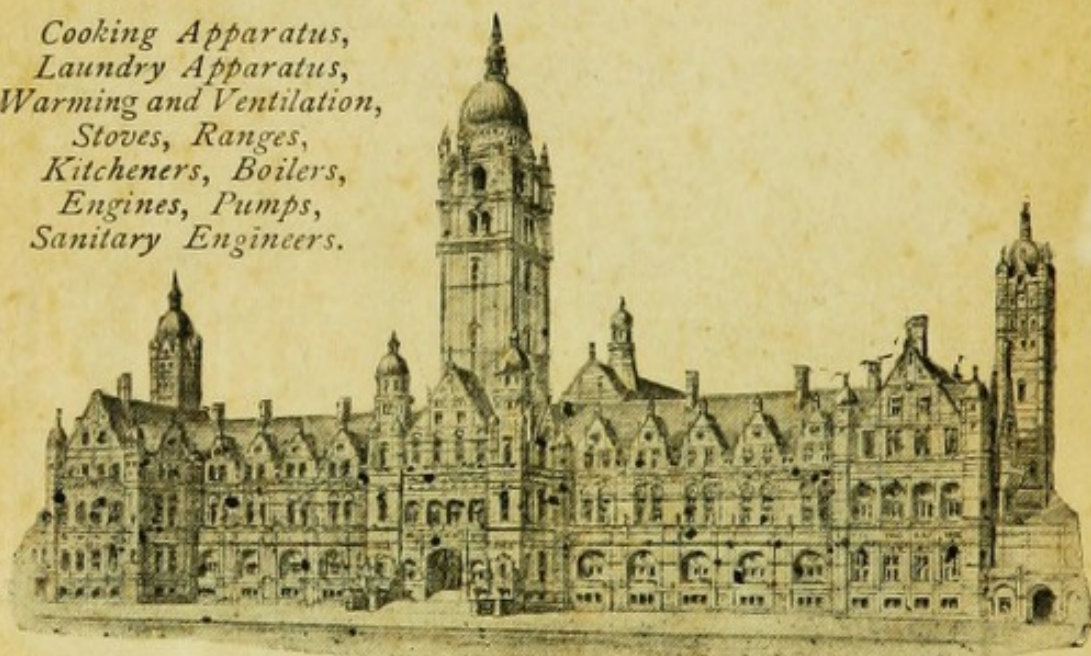
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