On an improved apparatus for spray inhalations / [James Adams].

ON AN

IMPROVED APPARATUS FOR SPRAY INHALATIONS.

(*Read before the Glasgow Medico-Chirurgical Society, 20th December, 1878.*)

It is now ten years since I read in this Society a communication on "Medicinal Inhalations, with description of an improved apparatus for the production of medicated vapours." * On that occasion I exhibited an Inhaler which was cordially approved by all the members who made it the subject of comment. That approval gave me gratification that compensated for an expenditure of much time, thought, and pecuniary outlay. The article immediately came into very general use. It was at first sold under the name of "The Adams Inhaler," but of late years, under the unrightful pretensions of a discreditable patent it was pirated, and has since been sold under the name of "Dr. Siegle's Patent Steam Spray Inhaler, with Boiler as suggested by Dr. Adams." I have two objects in bringing the instrument again under your notice. The first is, to show an improvement I have devised, that obviates certain inconveniences attendant upon the use of spray inhalers, adds to their efficiency, and lessens the cost of the medicaments employed. My second object is to show how therapeutic progress may be impeded through breach of that medical ethic which proclaims that medical men "lower their status when they attempt to establish a property in a remedy or other invention for the relief of disease, whether by concealment, or by patenting, or by advertising the invention for the benefit of its presumed owner." † For these objects it is necessary, and I think it will be interesting, that I should give a short resumé of the history of spray producers. This will enable you to accord to any actual inventor his legitimate claims.

* Published in *Glasgow Medical Journal*, March, 1868.

† Dr. Gairdner *On Certain Moral Aspects of Money Getting*. MacLehose, Glasgow. 1868.

The use of medicated vapours, or of simple steam vapour, in the treatment of diseases has been practised from the earliest times. The dispersion of liquid medicines, in the form of a fine mist or spray, to which the term "pulverizing," or "atomizing," is generally applied, is also an old practice. On a large scale, and by means of arrangements restricted to establishments located in certain watering places on the Continent, it has been many years in use.

In 1858, a medical man named Sales Girons, of Pierrefond, in France, constructed "a portable apparatus" for the pulverization of fluids containing dissolved medicaments, *whether volatile or non-volatile*, for the purpose of inhalation in the treatment of disease. After that date, numerous medical men throughout Europe contributed their ideas and aided the construction of various contrivances for the more effective carrying out of the principle of pulverizing fluids. It is admittedly a valuable principle in the treatment of disease, and every approach to efficiency and economy in its application has been welcomed by the medical profession. The apparatus of Sales Girons consisted of a force-pump projecting a very fine jet of fluid. The stream at the moment of exit struck upon a metal disc, and was scattered and broken up into a fine mist or spray. Numerous modifications of the instrument were quickly in use, but all essentially acted on the same principle —viz., the striking of a stream of fluid against an obstacle.

In 1859, M. Mathieu, of Paris, contributed a new idea for the mechanism. He exhibited an instrument in which the medicated fluid escaped slowly, drop by drop, into a tube through which passed a blast of compressed air. The fluid was thus projected forcibly through the fine open end of the tube in the form of a very fine, but very cold spray.

In 1862 a more important change was effected by Dr. Bergson, of Germany, who, in accordance with a suggestion of Dr. Natanson, constructed an instrument which he called "Hydrokomion," or "Water Dust Apparatus." He made use of the motive principle exemplified in Giffard's Steam Injector, as used in feeding engine boilers. In that contrivance a forcible jet of steam is led into a pipe, one end of which dips into a reservoir of water and the other end dips into the boiler. The steam jet produces a suction which exhausts the air in the pipe, and the water in the reservoir is then by atmospheric pressure forced up into the pipe so exhausted of air, and is caught by the rush of steam and projected into the boiler. Dr. Bergson followed out this principle. He employed two glass tubes, the capillary openings of each meeting, and

being held at right angles with the other. The free end of one tube dips into the reservoir of fluid to be pulverized, while the free end of the second tube is attached to an india-rubber pipe with two india-rubber balls, one of which, when compressed by the hands, drives a current of air in the manner of a bellows through one tube. The air escaping at the point where the two tubes meet at right angles, causes a vacuum in the tube that dips into the reservoir, the fluid from which ascends through aspiration exactly as in Giffard's injector, and is blown into a fine spray. He thus produced a perfect and convenient apparatus, usefully employed at the present day. In some works, as Morell Mackenzie's, and also by some English instrument dealers, it is erroneously called Dr. Andrew Clarke's Spray Producer; and, with the points of the tubes tipped with gold or silver, it was patented as "Dr. Dewar's Patent Spray Producer;" but, as I have already stated, the instrument in its completed form is entirely the invention of Dr. Bergson. Dr. Richardson's spray producer, for the local application of ether, has the pipe fashioned precisely after the manner of Giffard's steam injector, and is also the legitimate outcome of Dr. Bergson's idea.

In the same year that Dr. Bergson effected this most important and suggestive improvement Dr. H. Waldenburg, a German physician, constructed an instrument, and published its description in the *Allg. Med. Central Zeitung, No. 42, 1862.* In this apparatus he introduced the use of steam as the motive power. He employed a spirit lamp to generate steam in a glass boiler, to which was attached a tube conveying the jet of steam which met and mingled with a fine jet of medicated fluid projected from another apparatus attached or brought into connection. He thus produced what he termed "fog vapour." Dr. Waldenburg described at the same time an apparatus, the idea of which was communicated to him by the chemist, Dr. G. Reichenheim, whereby, in the same instrument, steam and medicated spray were produced at one and the same time. The instrument consisted of a glass boiler in which the medicated fluid is placed and heated by a spirit lamp. A bent glass tube is inserted through the cork of the boiler, and passed to near the bottom of the vessel. The tube is made wide at the lower part and tapers upwards to a very fine capillary point, and the portion of the tube outside the boiler is bent at a right angle in a horizontal direction. As the steam is generated in the boiler it presses on the medicated liquid and forces it upwards in a fine stream through the capillary point of the tube, where it escapes in the form of a combination of spray and steam. If

necessary, for the more effective pulverization of the spray, nothing remains, he says, but to place some resistance to the stream at the point of its escape.

Such was the position of this therapeutic agent, originated by Sales Girons, and built up by the unselfish labours of medical men, when, in 1863, Dr. Siegle, of Stuttgart, adopted the idea recently made public by Waldenburg, of producing *medicated spray in combination with steam and through the motive power of that principle.* He employed Waldenburg's glass boiler, heated in like manner by a spirit lamp for generating the steam, and he made use of Bergson's tubes, inserting that tube designed to convey the steam through the cork of the boiler precisely as described by Reichenheim, the other tube dipping into the reservoir of medicated liquid as in Bergson's apparatus. Dr. Siegle describes his instrument in a work published at Stuttgart in 1864 (A. Kroner, publisher), and to the extent that it effects the objects of combining previous arrangements and suggestions he is entitled to a share of credit among other improvers of Sales Girons' invention. He did not, however, as is too commonly supposed, pretend to have discovered the principle or to have originated the mechanical contrivances; for the principle and the contrivances alike were, as I have shown, in common knowledge and in familiar use. He at first only claimed merit for *the material* of which the instrument was constructed, and for *the arrangement or form of its parts.* Thus, he claimed an instrument the essential parts of which were (*a*) a boiler made "entirely of glass;" (*b*) the addition of "a brass screw" to the ordinary spirit lamp so as more readily to raise or lower the wick; (*c*) the attachment of a Collardeau's thermo-barometer within the boiler, and inserted through a hole in the india-rubber stopper; and (*d*) a metal case or jacket completely surrounding the entire apparatus with the object of lessening the danger from fragments of glass when the anticipated occasional explosions did occur. This is the actual sum and substance of Siegle's *patent,* as carefully specified and claimed in his Letters Patent.

Under ordinary circumstances it would be ungenerous to criticise with severity any contrivance for the relief of suffering humanity, especially when designed by a medical man, but Dr. Siegle *patented, for his exclusive personal benefit,* his attempted combination of other people's ideas, in this respect differing from all his predecessors. It is, I presume, generally known that neither merit nor originality are necessary for securing the privileges of a patent, and, therefore, it was open to Dr. Siegle, or to Brown, Jones, or Robinson, to take out a

patent for any *novelty* introduced into this country from abroad, irrespective of who the actual inventor or constructor might be. Dr. Siegle accordingly availed himself of this peculiarity of the law of patents, and, in due time, he sold, or for some other consideration assigned, this patent of questionable merit to certain instrument makers. These tradesmen straightway fastened upon the developed idea of Sales Girons, to which so many unselfish minds had substantially contributed, and made "Dr. Siegle's patent" a pretext for frightening away other makers, and for years grasping exorbitant prices, to the public injury, through a most undeserved monopoly of manufacture.

I trust to your indulgence if I enlarge a little on the subject of patenting in the present connection; for the instance I am discussing illustrates several of the evils resulting from a violation of the medical ethic I quoted in my opening remarks. By patenting the contrivance under consideration, professional status was lowered and a public injury inflicted. Passing from the first evil, which does more than personally affect the patentee, inasmuch as it reacts injuriously upon the social standing of the profession as a body, it is easy to show that the exorbitant prices charged have been a public injury. An inhaler, *i. e.*, a recognized therapeutic agent, is not an instrument by the use of which individuals carry on their occupation, or in any manner recoup their outlay by securing a pecuniary return. It is an instrument designed for domestic use on occasions of suffering and sickness to which common humanity is subject. It is a means or agent by the use of which medical men have satisfied themselves that the lives of their patients may often be preserved, health often improved, and suffering often mitigated or entirely prevented. It is an instrument frequently required on emergency, and its use is often a necessity. A high price is therefore a public calamity, and a price artificially heightened by a monopoly is a public injury. It has been abundantly demonstrated that several adjuncts of Siegle's *patent* were not only *not necessary*, not only *superfluous*, but were *positively injurious*, and practically obstructive to its usefulness; that they not only unduly increased the cost of production, but actually hindered the efficient carrying out of the principle for which the instrument is designed. When to these wasteful additions to the first cost there is superadded the arbitrary royalty of a patentee, there is inflicted a direct injury to the invalid whose means debar him from the attainment of a necessary remedy. A disheartening barrier is also interposed between the knowledge of the remedy possessed by

the physician, and the agencies which, if available, would give effect to his knowledge. And still further, there is a formidable obstacle set up against further improvement, for the physician and tradesman alike are discouraged from attempting improvements, economical or otherwise, that are liable at any moment to be stifled by the over-riding pretensions of a patentee, and by his threat of vexatious and costly law proceedings. An eminent author has truly said that "to put a check on the reproduction of that which mankind find to be valuable, useful, pleasureable, is to put a check on human progress." (Farrar.) In point of fact, however, Dr. Siegle's attempted monopoly of profit, out of other people's ideas, was not *at first* remunerative to him, for his combination proved so clumsy, complicated, and dangerous, as to be practically unworkable and commercially unsaleable. Dr. Lewin, professor of surgery, at Berlin, published almost immediately a trenchant criticism of its defects. He graphically pictured a timid invalid using the inhaler, sitting with head thrown back, and mouth wide open, according to directions; his goggling eyeballs intently rivetted on the column of mercury in Collardeau's alarm barometer "as it oscillates between *the danger point* 1 and 2," while with outstretched hand, grasping the screw of the spirit lamp, he holds himself ready "when the danger height is exceeded" to instantly screw down the lamp. He showed that the outside metal case is insufficient to protect against the anticipated explosions of the glass boilers, because that the door of the case must be left open to permit the screwing down of the lamp, and also to admit air to the lamp itself, which otherwise could not burn. Fragments of glass would certainly, therefore, be projected through the open door of the case when explosions occurred. Dr. Lewin further showed how crude, and practically unfit, was the total construction of an instrument not intended for the hands of individuals accustomed to careful chemical manipulation, but, on the contrary, for the familiar, daily or hourly use of the sick chamber, in the hands of feeble, nervous invalids, their nurses, relatives, or domestic servants. Dr. Lewin insisted that the appalling alarm barometer should be at once done away with, and a safety valve substituted, that the boiler, instead of glass, should be made of strong metal not liable to explode, that the cork or stopper of the boiler, instead of india-rubber tied down every time the apparatus was used with wire or strings, after the manner of champagne bottles, should be made of metal with a screw collar, &c., &c. Other critics corroborated and supplemented Dr. Lewin's criticisms. They showed that the glass boiler was additionally liable to

getting broken on account of its faulty shape—viz., a flat bottom with angular sides, a shape that is practically discarded from laboratories on account of liability to fracture at the angle of the bottom. In short, the judgment of the profession and of the public was so adverse on the very points for which Dr. Siegle claimed merit that the makers quietly abandoned, one by one, the distinctive characters of the instrument, and as quietly took up the new suggestions. Nevertheless, through every modification, it remained an unshapely, complicated, inconvenient, and dangerous combination of disjointed material that was sold at 63s. in its best form, a cost that placed it beyond the reach of common use.

Such was the existing condition of the most improved Spray Inhaler when, in 1868, I designed the instrument which I then exhibited to you, and to which, in an improved form, I trust you will hold me justified in again directing your attention. When contrasted with Siegle's *Patent* Inhaler, it is seen that the two instruments could scarcely differ more widely either in material or in construction. And when I point out wherein they differ you will better appreciate those arrangements by which I have secured the greatest efficiency, conjoined with smallest cost, in carrying out Sales Girons' original conception. And here let me remark that the essence of his invention is the fact or idea that is embodied in it, and not the form or dress in which it is exemplified. His idea should never have been made a matter of property. No man can reasonably claim a right of property in the idea of employing any of the natural forces, such as wind, water, *steam*, or electricity. But he may justifiably do so with reference to the dress or form in which the idea is illustrated. That alone deserves protection. And if Sales Girons, or any of his respected coadjutors, had been imbued with commercial cupidity instead of professional sentiment, they could reasonably and honestly only have claimed merit and protection for the precise form of instrument with which they carried out Sales Girons' idea. To the credit of the profession, however, none of the other gentlemen I have named ever endeavoured to establish a right of property in Sales Girons' invention.

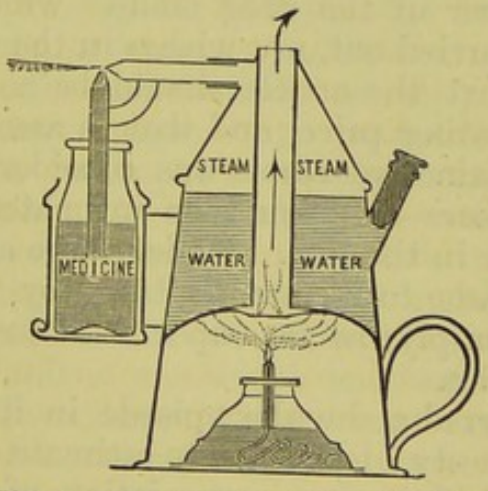
In Siegle's *Patent* Inhaler, which I now exhibit, the form of boiler is spherical, with a flat bottom. It is that known as the ordinary land boiler, consisting of one large mass with a great quantity of water in the centre. The heat is applied exclusively to the bottom, with the result that the water is evaporated at a low temperature, and the steam that is formed has the least degree of elasticity or force. It is called a low

pressure boiler. The steam being produced at a slow rate of development, the medicated liquids cannot possibly be pulverized or rarefied so minutely, projected so forcibly, or the spray maintained so uniformly as when steam is used that is formed in a high pressure boiler. When there is—as in the present case—no water line or other guage for regulating the quantity of water originally placed in the boiler, and for preventing overfilling, there is great liability to several serious accidents. Thus, as explained by Donnè, when water has been deprived by heat of that portion of air which it normally contains, there then occurs a capricious variability in its capacity of expanding and of generating steam. In practice, this annoying and dangerous peculiarity cannot be readily regulated, and hence a vessel of boiling water will now and again boil jerkingly and boil over; hence also a safety valve will frequently be seen in action, fitfully and intermittently. For want of a water line, the boiler in Siegle's Inhaler occasionally gets overfilled, and—owing to the cause specified—it boils over, or "primes," as it is technically called, and the water flowing over through the steam escape is projected forcibly in the face of the patient. It was from witnessing this accident frequently, that I was first led to make efforts in the way of improvement, for I found that it required much persuasion on the part of the physician, and considerable nerve on the part of the patient, to face Siegle's *Patent* Inhaler after one or two experiences of this nature. The liability to accidents through scalding was further increased by the angular shape and great length—4½ inches—of the steam escape pipe which rose vertically from the top of the boiler, and was bent at an acute angle in a horizontal direction. The low pressure steam, as it passed sluggishly through this long angular pipe, got cooled and condensed, and the drops collecting at the angle were forcibly spirted in the face of the patient. The faulty *shape* of the *patent* boiler was aggravated in the attendant results by the faulty *material* of which it was composed, *i. e., glass.* For when water is boiled in a close, or nearly close vessel, the quantity of steam generated is often suddenly doubled, and consequently the capacity of the containing vessel is suddenly subject to a double strain. The choice of *a glass boiler, with a securely fastened stopper,* was therefore a very faulty and ignorant choice, for glass is an imperfect conductor of heat, and cannot withstand sudden expansion or contraction. Hence the explosions which, singularly enough, were anticipated, and which actually occurred, notwithstanding the assurance of the maker (F. Mollenkopf, of Stuttgart), that each glass boiler was

carefully tested under a pressure of two atmospheres, or four times greater than, in his opinion, was necessary, for the force of steam required for pulverizing fluids. The suddenness of the expansions and contractions I have referred to had not been taken into account, or were insufficiently understood and appreciated.

I need not continue this depreciatory criticism of the many practical defects I might enumerate in the fabricating of this crudely fashioned *patent* instrument.

I will now refer to some of the merits which I claim for the model constructed by myself. *First*, it is entirely made of tin, and therefore strong; it is very portable and compact, and therefore easily handled and not readily disarranged. *Second*, it is sold by the retailer at 5s., a price that, while a mere fraction of the charge formerly exacted, is within fair limits of a physician's prescription and of an ordinary patient's means. *Third*, the boiler is markedly distinctive, and has many advantages. It is of tubular construction, and its expanded bottom and central flue present a large surface for the application of heat, the rapid and plentiful generating of steam, and—what is of even greater moment—the drying, or rarefying, or superheating of the steam after it is generated. For the central flue, which passes through the boiler and provides a chimney to the spirit lamp, also carries the flame with a sharp draught, and consequently with an intensified heating power through



SECTIONAL VIEW OF DR. ADAMS' INHALER.

the steam chamber. The steam collecting in this chamber is, at the instant of escape, brought by the conical-shaped top into close contact with the central flue, and is thus superheated and dried, and delivered in a more elastic condition, thereby ensuring a more effective pulverization of the medicated fluid. By carrying the flue of the lamp through the centre of the boiler, excessive heat is diverted from the outside where such

heat would be inconvenient, and therefore, a handle which is attached to the lower and cooler part of the instrument can be grasped with comfort and safety, even when in use. The position of the water inlet at the side of the boiler, instead of the top, prevents overfilling, and at the same time provides a water line and a defined steam reservoir. *Fourth*, a common cork acts as stopper to the boiler, and is a perfectly sufficient substitute for the alarming looking and costly safety valve that Siegle had adopted after suggestion from without. *Fifth*, the steam escape pipe is only 1 inch long, has no angles—consequently does not cool or condense the steam—and scalding accidents never occur.

There are other details of minor importance which in their combination make the apparatus more convenient in use.

The cordial approval which attended the first exhibition of the instrument in this Society was followed by such approval on the part of the public that it has since virtually superseded all other instruments in the market. A patent for myself had been pressed upon me, but my ideas on the subject of medical patents were those I have already expressed. As, however, I had found disappointment and annoyance owing to my patterns and directions being departed from by workmen who did not understand what I was aiming at, I gave over whatever right of property or patronage I might possess to a respectable member of the drug trade,* who undertook, and most faithfully carried out, my wishes in the manufacture. I stipulated only that the article should be sold at the lowest possible remunerating price, and that in associating my name with it—as a distinctive name was considered necessary for commercial purposes—it should be intimated that I had no interest whatever in the sale. Under these arrangements, the apparatus soon came to be manufactured by the thousand, as well for home supply, as for exportation to the Colonies and to foreign countries.

And here occurred a singular episode in its history. With an amount of honesty I leave you to estimate, with no courtesy, but with a most flattering appreciation of my labour, the manufacturers of Siegle's *Patent* Inhaler dropped their unsaleable merchandise, and pirated my model. Indeed, it is very well understood that no specimen of Siegle's *Patent* Inhaler, in its original form as patented, and few, if any, of the modifications actually existing at the date when I introduced my apparatus, have since been manufactured.

"Siegle's *Patent*" was the name given to the first instrument

* P. Harrower, Druggist, 136 Cowcaddens Street, Glasgow.

which appropriated the credit, and created a right of property in the original conceptions and philanthrophic labours of Sales Girons, Waldenburg, Reichenheim, Bergson, &c., &c., and "Siegle's *Patent*" continued to be impressed as a false legend on the modifications which quickly followed the criticisms of Professor Lewin and others. This practice was pursued in face of the fact that, in almost every instance where a new suggestion was appropriated, some distinctive *specialtè* claimed in the patent, was at the same time quietly abandoned. Thus the impracticable and dangerous *glass boiler*—specified as the grand feature of the patent—had been given up, and the suggested substitute of a strong metal boiler adopted. The *outside protection of a metal jacket* had been given up, having proved useless at the best, and no pretext for its continuance any longer existing. The *screw* for regulating the flame of the common spirit lamp, so carefully specified as essential, had been given up as in no way necessary. Collardeau's *thermo-barometer* had been given up in favour of a suggested substitute—viz., a costly, useless, *very unworkable*, and alarming safety valve.* The dangerous and troublesome india-rubber stopper, tied down securely with strings and wires, and requiring to be opened up every time the instrument was used, had been given up for a metal stopper with a screw collar, and so it was with other details I need not enumerate. But through all changes, the assumption of property rights under the pretext of *Patent* rights was asserted. And now my model, which had cost me so much in time, thought, and money expenditure, was laid hold of in its entirety, and with its adjuncts to the wooden packing case, the printed directions, the sale label, the woodcut illustrations, all were barefacedly pirated, and with the characteristic shameless consistency, stamped "*Siegle's Patent.*" Indeed, I am informed that certain electrotype blocks, prepared to illustrate my apparatus, and which had been supplied for that purpose to an advertising printer, went amissing, and were afterwards traced by a microscopic examination of letters,

* I exhibit one of these boilers with "*safety* valve," which was tested for me by a mechanical expert. The valve only began to yield at a pressure exceeding 70 lbs. on the square inch. Long ere that pressure could have been reached in ordinary use, the boiler would have burst, or the escape pipe, followed by the scalding water, would have been blown out in the patient's face. With so little true mechanical knowledge had suggested improvements been applied. This valve was adhered to in the *Patent* instrument, until by my model I had proved it to be wholly unnecessary.

lines, and figures, as having been used, actually, or by a transfer, to illustrate "*Siegle's Patent.*"

"For this is law, I will maintain,
Until my dying day, Sir,
That whatsoever King may reign,
I'll be the Vicar of Bray, Sir."

While restricted to the actual apparatus devised by Dr. Siegle, there is no fault to be found in the association of the name with the article. It is commercially convenient, and it awards due merit. The name of a medical man may as legitimately be applied to an article as to a disease. Thus we speak of Bright's disease, and of Colles' fracture, and we ask at the instrument maker for M'Intyre's splint, Syme's abscess lancet, or Buchanan's rectangular staff. The names are here employed in an honourable connection. Such men find their sufficient reward in the consciousness of having made a useful addition to our remedial agents, the stores of which they desire to be common to the uses of medical science. But there is no analogy between the honourable connection in which these names are spoken and that connection in which "*Siegle's Patent*" is stamped upon my model, as a symbol of merit and of exclusive right of property, to cover an act of shameless plagiarism and spoliation.

The only point not slavishly imitated by Dr. Siegle's assignees was in the matter of cost. That was immediately raised 50 per cent above the price which had been proved to be fairly remunerative. If "Dr. Siegle's Patent" had not hitherto been a commercial success, it now yielded a rich harvest.* For the profits upon the trade created by my apparatus were now transferred to the pockets of Dr. Siegle's assignees, and these profits were supplemented by levies made upon the principal druggists throughout the kingdom. To avoid threatened law proceedings for alleged infringement of Dr. Siegle's *rights*, many respectable tradesmen were glad to compound for sums of £20 or thereby. Dr. Siegle's professional brethren were also made to pass under his yoke. Thus, Professor Lister was mulct in heavy "royalties" for having

* The profitable trade thus appropriated may be inferred from the experience of a single retail house. Messrs. Hilliard, of this city, before the introduction of my Inhaler, found that a supply of half-a-dozen of "Siegle's Patent" laid in at the beginning of the year kept them abundantly in stock. But my model was ordered in quantities of six dozen at a time, and they feel safe in stating that the trade was not merely doubled or quadrupled, but that it was 40 times increased. Meanwhile, the sale of Dr. Siegle's Patent entirely and speedily ceased, my model being substituted and sold under that name.

used, and for permission to employ, an enlarged form of the apparatus for hospital use, for the production of antiseptic spray in the dressing of wounds.*

From such modes of levying "black mail" a considerable sum altogether must have been collected at this time. Meanwhile an application was made in Glasgow to have my maker interdicted from manufacturing the apparatus, on the plea that it infringed "Dr. Siegle's *patent*." But the assignees were unable—or wisely declined—to show an instrument made after the patent specification, and the late Principal Sheriff Dickson, after examining and comparing those instruments they actually did make with mine—after examining the specification, and after hearing parties, refused interdict; saying, "he could not see even a colourable resemblance," so widely did the specification, as well as the articles hitherto manufactured, differ from my apparatus. But the matter did not end here; for, as in giving evidence, I had distinctly repudiated any personal interest or claim, the admission made an opening for a renewed application, under the pretext, so far as I recollect, that if Dr. Siegle could not show right to the material and construction of the new model, he was entitled, at least, to *the exclusive use of steam* in any apparatus used for spray inhalations. I have already shown that he had no more to do with originating this suggestion than with that of the telephone. But this fact was not sufficiently known in this country at the time; and, moreover, it was considered necessary by the law agents that I should permit my name to be used in any further law proceedings, as well to vindicate the public right as to prevent the appropriation of my model as was now the suspected intention. It was a painful alternative, but I could not compromise my position as already explained. Therefore, as the maker of my apparatus could not claim as his own invention, he could not show right to defend the action, and interdict was granted against him; and, as I positively declined to interfere in any way, Dr. Siegle's assignees had the field to themselves. They appropriated my apparatus as already stated, and have enjoyed the

* In the discussion which followed the reading of my communication, various speakers gave corroborative evidence, from their personal knowledge, of the great obstacle, and at times the actual hindrance to the use of my cheap model, caused by the pretensions and exactions of the assignees to "Siegle's *Patent*." Thus, it was stated by Dr. Thomas, Medical Superintendent of the Royal Infirmary, that a royalty of £2 for each apparatus was levied upon the hospital for permission to use the enlarged form of the instrument devised by Professor Lister; and Dr. Clark stated that the increased price exacted on the ordinary instruments had hindered and in great measure "stamped out" the use of the inhaler in the large Belvidere Hospital.

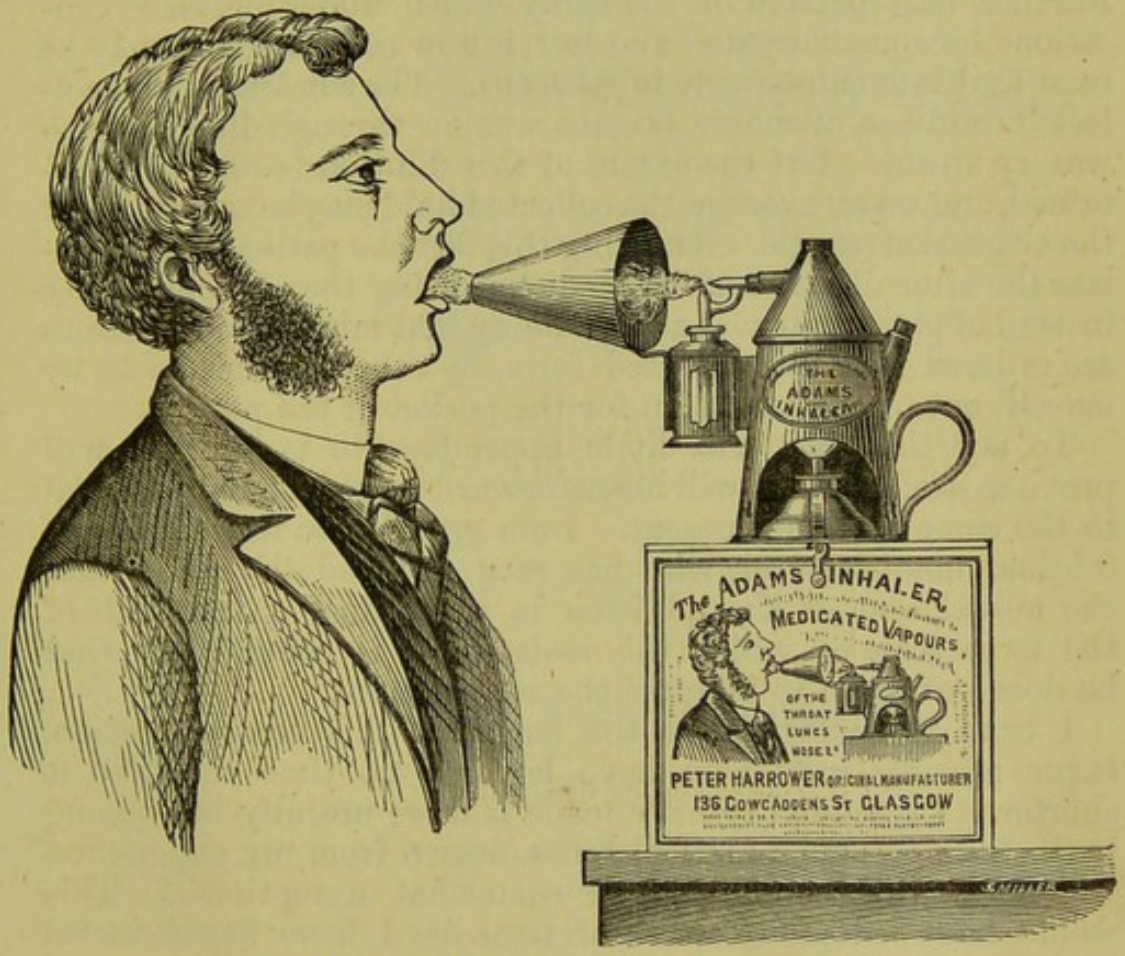
profits of the coveted monopoly of manufacture till the present time, when the *Patent* rights have expired.

I ask your forbearance for the time occupied in this digressive episode, but it is part of my argument in illustrating the ungenerous and mischievous bearing upon therapeutic progress, of a medical man, patenting and monopolizing for his personal advantage, a therapeutic agent.

Before leaving Dr. Siegle and his assignees I must refer for a moment to the mechanical notions, or rather to the want of such, manifested throughout every modification of apparatus that they have adopted or "appropriated." It is said of Goldsmith, that he touched nothing he did not adorn, but of Siegle's assignees it might be said, that they touch nothing they do not spoil. After sticking closely to my pattern for a considerable period, they have endeavoured to improve upon its shape, and they have altered the conical top of the boiler for a rounded dome. This lessens in a trifling degree the manufacturer's cost, and, consequently, increases his profit, the retail price remaining unchanged. But it misses the objects I had in view in devising the conical top—viz., the drying, and thereby increasing the elastic force of the steam at the instant of its escape, and also of preventing the risk of "priming" of the boiler, or of lodgment of wet steam in the escape pipe.

And now, after the fashion of a lady's letter, the pith of which is in the postscript, I come to the more novel and practical portion of my communication. A very annoying incident has hitherto attached to the use of the spray inhaler. The spray scatters over the face, eyes, and dress of the patient, and of his bed clothes when in bed. A separate apparatus, consisting of a screen with a hole in the centre, mounted on a support, and having a vessel to contain the condensed spray as it trickles down, has been recommended, and is *occasionally* employed; and a funnel shaped screen of card board, or of stout paper, or other material, held in the hand, is *frequently* employed. But in practice the use of even the best of these make-shift contrivances, setting aside the extra cost, is insufficient to prevent annoyance. There is difficulty in adjusting the stand-mounted screen so as to save the patient from a strained position, particularly while in bed. The vapour, moreover, does not always get through the hole in the screen, but is caught at an angle and deflected with every movement of the hand or face. There is a further annoyance caused by the vapour that is intercepted by a hand screen becoming condensed on the screen, and from thence trickling down upon the bedding, or upon the table, if the patient is out of bed. I have found these inconveniences to be substantial

drawbacks to comfort and efficiency in the use of spray inhalers, and I have devised a remedy. This consists in a light tin funnel about 5 inches long, 3 inches wide at one end, and three-fourths of an inch at the other. A narrow slip of tin soldered to the wide end of the funnel, and sliding into a groove on the body of the inhaler in front, places and keeps the funnel in a horizontal position. This addition to the inhaler, which I will call the "face protector," conducts the spray projected through the wide end of the funnel, while the



DR. ADAMS' INHALER WITH "FACE PROTECTOR."

narrow end is placed within, or close to, the patient's mouth. The wide end of the funnel is partially enclosed at its lower edge for about a fifth part of its diameter, thereby forming a cup or receptacle for collecting the spray that condenses within the funnel, and which would otherwise have been dissipated and lost. The protection afforded by this little arrangement is so complete, and its other advantages so decided, that I cannot doubt it will be found attached to the next edition of "Siegle's *Patent.*" The apparatus is subject to no disarrangement in whatever position it is handled, and the vapour is directed

fully and fairly into the mouth or nostril of the patient as may be desired. The face protector is attached or detached with instant facility, so that it is no obstacle when the physician desires to avoid a concentrated medicinal inhalation, as in the case of infants, or of sleeping invalids. Besides protection to the face, it acts as a "spray economizer," and that in two modes. Through experiment I have found that a larger proportion of the medicinal vapour is conducted into the mouth of the patient, and actually inhaled during its use. Further, that portion of the spray which, under previous conditions became dissipated and lost, is now collected, and may be used to dilute subsequent inhalations. The condensed and collected fluid has, of course, become weaker through dilution with watery steam. But the extent of this dilution is readily ascertained, and, on an average, the collected fluid may be taken as half the original strength. Knowing this fact the patient may regulate the after dilution of his medicine, using the collected spray instead of plain water. I am assuming that inhalation medicines are ordered in a concentrated form, by other physicians as by myself, out of consideration for the pocket of the patient.

To my thinking, this little appendage to my inhaler will prove so useful that it will henceforward be considered essential to the completed instrument. I am gratified to learn from the original manufacturer, who has now resumed the trade, that the actual cost of the addition is so trifling, on account of the large scale on which the instrument is being made, that he does not mean to increase the selling price.

I have to apologize for the length of this communication. Some adverse influences have left me no time to make it shorter. I intended to have made it more usefully interesting by including some practical hints, drawn from my experience, which, in this connection, is somewhat exceptional. This would have led me to speak of remedies I have found useful in dealing with certain forms of chest and throat disease, and also of that troublesome affection ozæna, which I have found in several recent instances capable of being greatly relieved. For these intentions I may find another opportunity, and, meanwhile, I trust I have shown to your conviction, and accompanied, as I further hope, with some measure of your generous sympathy, that to other agencies than "Siegle's *Patent* Inhaler" may be attributed some share of merit in extending the practice and illustrating the benefits of Sales Girons' admirable therapeutic invention.

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