**A system of appliances for correcting irregularities of the teeth.**

A

# SYSTEM OF APPLIANCES

FOR

# Correcting Irregularities

# OF THE TEETH.

BY

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# THE ANGLE SYSTEM OF REGULATION AND RETENTION OF TEETH.

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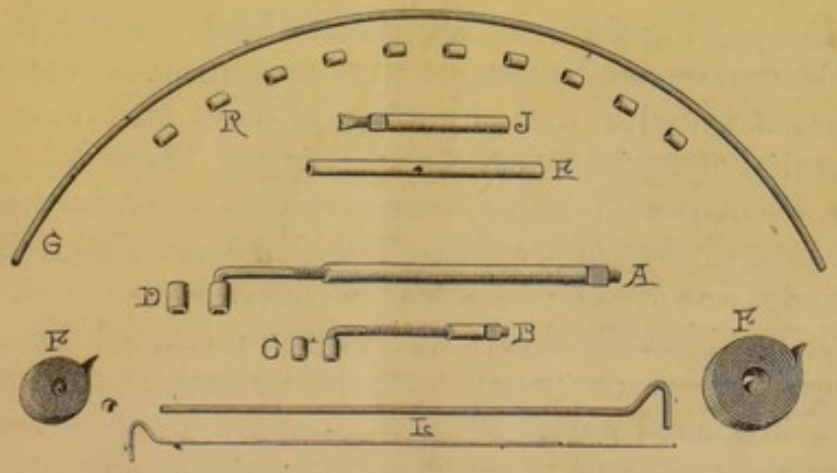
SINCE the first publication of this system, experience in the treatment of a large number of cases has resulted in the subjection of these appliances many times to the most severe tests. As a result of this, several modifications have been developed, both in the application as well as the proportions of the different parts, together with an entire change in the material from which the appliances are constructed. The little pipes were originally constructed from wire containing seams. They are now made seamless, which is an advantage.

It is believed that the set of appliances shown in Fig. 1 is very nearly faultless.

FIG. 1.




SET NO. 1, ANGLE'S APPLIANCES.

It is not my intention at this time to give a full and complete treatise on Orthodontia, but rather to give my own

method of accomplishing the different movements in the correct adjustment of malposed teeth, believing that most practitioners will succeed far better by adopting *one* method and thoroughly familiarizing themselves with the principles of the same, than they will by but a general understanding of the almost innumerable methods and appliances which have been brought out from time to time.

To those who wish to pursue the subject as to the Etiology, together with the history of methods and appliances in general, I would recommend the excellent works on the subject by Drs. Guilford and Kingsley.

In studying the construction and application of any system having for its object the treatment of dental irregularities, the fundamental principles will be more easily understood if we remember the movements of the teeth in regulating are limited to one or more of the following:

Forward in line of arch; backward in line of arch; from without, inward; from within, outward; rotation, and occasionally elongation or depression. The physiological principles governing all these movements are the same, so that by understanding the principles governing one, we may comprehend all.

In applying force to a tooth, it should be direct, and sufficient to accomplish the desired movement as rapidly as is consistent with the physiological law governing the absorption of bone in each case. This law varies so greatly with different individuals, and at different ages, that no fixed rate, or even approximate rate, can ever be established. The judgment of the operator must determine.

In no instance should the pressure exerted be great enough to occasion pain; if so, the normal rate of absorption is interfered with.

A very safe rule to apply, whether the pressure be constant or irregular, is to see that it does in no instance *exceed a snug feeling.* I am convinced that this feeling is the true indication of the proper amount of force.

Another very important principle which should always be borne in mind while performing the movements of a tooth is, that pressure should *never be wholly* relinquished.

The movement of a tooth may be arrested as often as necessary, but never allowed, by reason of removal of pressure, to spring backward, thus interfering with the process of repair.

I am convinced that disregarding this principle (as has usually been necessary in the ordinary regulating appliances, by the reason of the faulty principles on which their construction has been based, necessitating their frequent removal for purposes of modification and cleansing) has been the occasion of nearly all the pain and soreness in regulating.

The result of this in many cases has been discouragement on the part of the patient, and much annoyance and frequent failure on that of the operator. The movement of a tooth, if intelligently accomplished, should be painless.

Another very important principle to be remembered is, that support and perfect rest are essential to a tooth after it has been moved into the desired position.

Any appliance for retaining a tooth which necessitates its frequent removal should never be used. Again, a retaining appliance should be so delicate that it may be worn without inconvenience to the patient, until perfect firmness has been established, and should never be under the control of the patient. It may be needless to remark that a tooth so retained will become firm in its new position much more speedily than if subjected to occasional disturbances. It is believed the following system of treating dental irregularities enables the intelligent operator to easily fulfill the requirements so far enumerated.

In deciding upon a proper course of treatment in any given case, much care and judgment should always be exercised, beside a careful study of the features and the due consideration of the probable modifying effects of the proposed changes, the establishment of correct occlusion, etc.

A valuable assistant will always be found by first obtaining careful and accurate models of both jaws, and correctly articulating the same.

Such models not only assist in forming a basis for correctly establishing the proper line of operation, but are exceedingly valuable as reference during the whole course of treatment, for, from such models accurate measurements may be taken from time to time, and comparisons may be made with the teeth as the case progresses.

In this way we may not only judge of the exact speed of the moving teeth, but unfavorable movements of the anchor teeth may be detected.

In order that these models may be of any value they must not only accurately show the positions of the teeth and cusps, but they must also indicate the rugæ, gums and as much of the roots and positions of the same as is indicated by the shape of the gums and alveoli up to the point where the attachments of the muscles render obscure the further shape of the jaw.

From the large number of imperfect models that I have received from dentists, I am of the opinion that the value of correct models is not sufficiently appreciated.

After trying all kinds of impression materials and different methods of taking impressions, I am well satisfied that the best material is plaster,* and it should be used as follows:

In the first place, the impression cups for sale at the different depots are all incorrect and ill adapted to the purpose of obtaining impressions of a jaw containing full dentures, for the reason that they are all intended for obtaining impressions of edentalous jaws. The rim of these cups, as well as the portions covering the palatine process, are entirely too low; they should be much higher.

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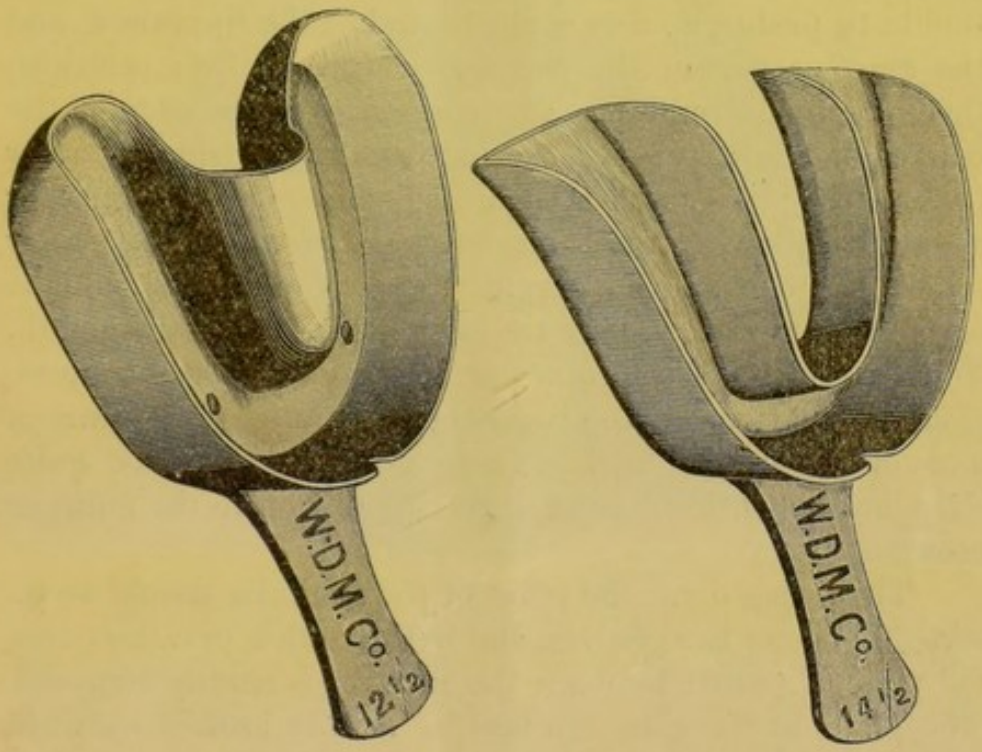
* Since writing the above I have been experimenting with Teague's Impression Compound, a substance similar to plaster, which is probably in some respects superior.

By obtaining a few sizes of the cups designed by the author, as represented in Fig. 2, the difficulty of taking

Fig 2.




IMPRESSION CUPS FOR IRREGULARITIES.

impressions high up or low down (depending upon whether it be the upper or lower jaw) is wholly obviated.

When a cup suitable to the case has been selected, it should be slightly oiled, or coated with a film of fine castile soap, which can be easily accomplished by moistening a small pledget of clean cotton in water, rubbing it over a piece of soap, and then over the cup. It is also well to coat the teeth in the same manner.

When the impression plaster has been mixed to the usual consistency, and distributed in the cups, nearly as it

should appear after the impression is taken, and the patient, provided with a clean towel about the neck, has been instructed to sit upright, the mouth is opened and the cup inserted. The head should be somewhat thrown forward to prevent the plaster from falling into the throat. The cup should be pushed up first at the heel, then the lips raised, and the anterior part of the cup forced well up into position; then the lips should be drawn down over the edge of the cup, and a slight pressure exerted from the outside in order to force the plaster well up against the muscles. The plaster should be allowed to become hard and *thoroughly set*, after which the cup and all surplus pieces of plaster should be carefully removed, leaving the impression still in the mouth. With a blade of a penknife cut two grooves in the impression, the positions of the grooves being parallel to the lines of axes of the cuspid teeth. These grooves should be quite deep, but not entirely through the impression to the gums or crowns.

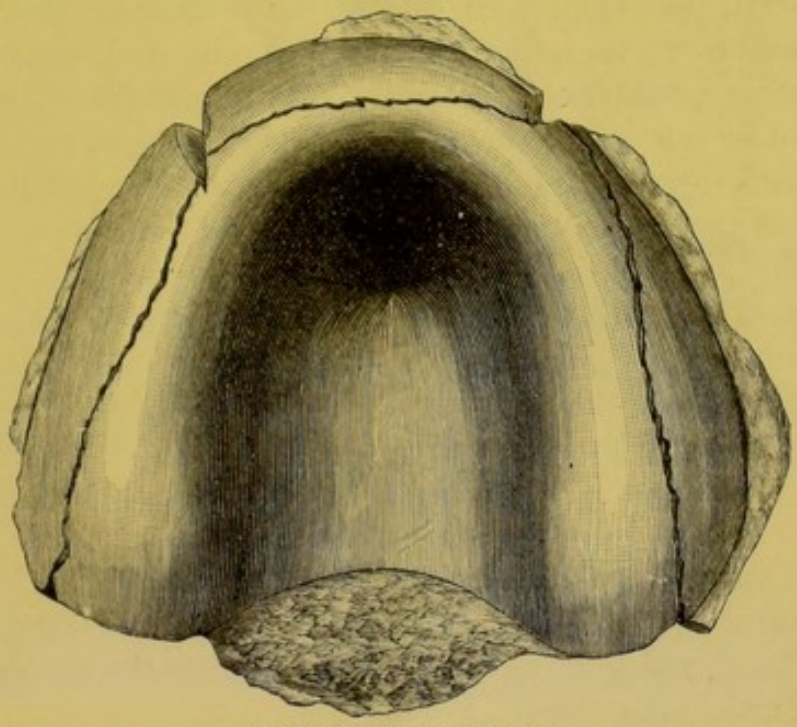
This being done, the point of the penknife should be inserted in one of the grooves, and with a quick pry, the external plate of plaster between the grooves is readily removed. The plates at the sides can now be readily broken outward between the thumb and finger, the line of fracture will follow the cutting edges of the teeth, then the large piece of plaster covering the roof of the mouth is readily worked loose and removed in one piece.

If the operation has been carefully performed, the impression will consist of but four pieces.

After drying a few moments, they are readily replaced in their proper positions, in the order in which they were removed, and secured by wax, or, better still, moistening the edges of the fracture with celluloid dissolved in ether, as suggested by Dr. Van Duzee. *Never attempt to re-unite the pieces by placing in cups.*

The impression should now appear as shown in Fig. 3.

FIG. 3.



IMPRESSION RE-UNITED.

Not later than one-half hour after the impression has been taken, the inside should be thoroughly coated with shellac varnish ; at the expiration of another half hour, again coated with sandarac varnish, and at the end of still another half hour, it should be very carefully filled with plaster and turned upside down on a glass slab.

After the plaster is thoroughly set, the pieces of the impression may usually be readily separated in the same order in which they were removed from the mouth.

The model can now be trimmed, and not only will there be a surface as smooth as the most finely polished marble, but each cusp, and all the interdental spaces, as well as the rugæ, and even the minute "stipples" of the gum will be most accurately and beautifully shown. The models should now be neatly labeled, and will serve all the purposes of study and reference already enumerated.

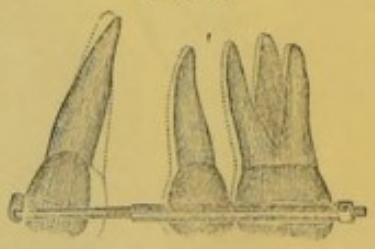
We now come to another most important principle,

which should be remembered in the movement of a tooth; that is, that correct or stationary anchorage should be secured.

Teeth that have been selected as anchorage should be attached to in such manner that tipping and consequent movement would be impossible, or if movement of such a tooth does take place the anchorage should be so rigid that the tooth must be dragged bodily through the alveolus, the apices of the root moving fully as much as the crown.

This principle is well illustrated in Fig. 4, in which the anchor-teeth are banded, and a pipe or sheath through which the screw pulls is rigidly attached by means of solder, as the bands on the anchor-teeth are firmly cemented. It will be seen that perfect anchorage is established and consequent tipping of the same is thereby rendered impossible.

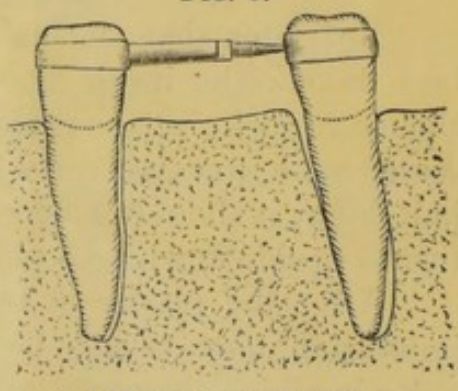
FIG. 4.



STATIONARY ANCHORAGE.

The dotted lines in the diagram indicate the movements which must take place. Fig. 5 shows the same principle where the motion is pushing instead of pulling. The base of the jack-screw in this case is soldered to the band.

FIG. 5.



LATERAL MOVEMENT.

It will be readily comprehended how greatly anchorage is increased over the old method, when advantage is taken of this method of anchorage.

Figure 1, Angle's Appliances, shows the simple appliances from which all the various combinations used in the method may be made. "A" is a large traction screw incased in its accompanying tube, and used for pulling where the resistance is great. "B" is a smaller traction screw, used in the same way where the resistance is slight, or where from any reason a delicate appliance is desired. "C" and

"D" are tubes which are soldered to bands placed upon the teeth to be moved, into which the ends of the traction screw are hooked. "J" is a jack screw, used for pushing, the end of which is beaten flat. "E" is an extra piece of tubing, by means of which a longer jack screw can be made. "F" are coils of band material. "G" is a gold wire used in retaining the teeth after they have been moved into the desired positions; also, to assist in securing an anchorage in some cases; and "R" are small retaining tubes designed to be soldered to bands into which the retaining wire accurately fits. "L" are piano-wire levers of varying sizes, giving different degrees of power.

It will thus be seen that the appliances are very simple, and few in number, they being limited practically to three, viz.: the lever for rotating, the screw for pushing, and the traction screw for pulling, the other pieces being for the purpose of securing attachments, and, aside from the advantages of simplicity, efficiency and cleanliness, stationary anchorage, non-relinquishment of pressure, and firm retention may be easily accomplished by their intelligent application.

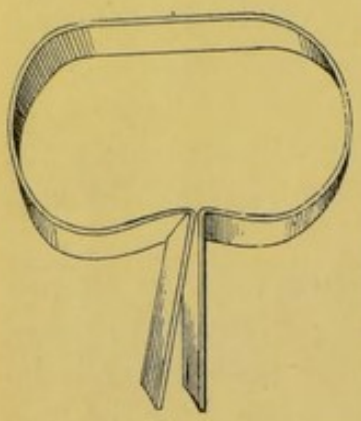
As it will be seen that the Magill band (Fig. 6) plays an important part in attaching the different parts of the appliances to the teeth, I will here describe the quickest, easiest, and most accurate way of making and setting these bands.

First, the rubber dam should be slipped over the tooth to be banded, and at least one more on each side, and it is usually better to include all the teeth to which the appliance is being adjusted. The surface of the tooth to be banded is then carefully cleansed by means of a pledget of cotton moistened in alcohol or ether. A loop of the band material is then slipped over the tooth.

I prefer German silver to any other metal, on account of its great strength; it may be rolled to extreme thinness, thereby occupying a small amount of space. The ends should now be grasped close to the tooth with a pair of closely-fitting, flat-nosed pliers, and the band drawn tightly

around the tooth, a strong burnisher being applied at the same time, to make it conform still further to the shape of the tooth; remove the band, which now presents the appearance shown in Fig. 6. Place a small bit of silver or gold solder and borax at the injunction, and carry the band in contact with the flame of the soldering-lamp. After it is soldered, clip the ends off, and the band is now ready for any attachment which may be made; after which it is cemented in position on the tooth, being gently driven to place by means of a foot-shaped plugger and small mallet.

FIG. 6.



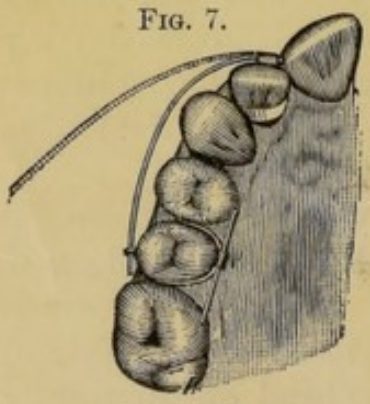
MAGILL BAND.
(Greatly Enlarged.)

If the teeth are firmly crowded together, space may be gained for the band by forcing first a thin spatula between them.

We might illustrate, without limit, the different ways of attaching and operating these appliances in accomplishing the movements of the teeth; but sufficient number of the many modifications of which they are susceptible is here shown to enable the average operator to become sufficiently familiar with them to treat all ordinary cases.

The movements of rotation of a tooth is accomplished by means of the lever shown at "L," Fig. 1. The tooth is banded in the manner already described. One of the small pipes, "R," Fig. 1, is soldered to the buccal surface of this band, and the band cemented in position upon the tooth; one end of the rotating lever is inserted into the pipe; the other is sprung around and latched into a hook soldered to a band encircling a suitable anchor tooth. Fig. 7 shows a lateral in-

FIG. 7.

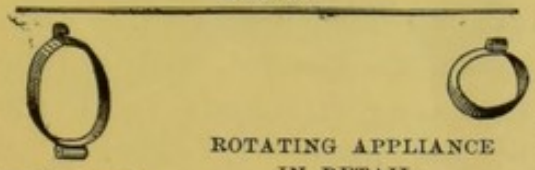


ROTATION.

cisor while being rotated by this appliance. It will be seen that a powerful and constant force is being exerted upon the tooth to be moved.

It will also be noticed that the anchor-tooth is re-inforced by a piece of the gold wire, "G," Fig. 1, passing through a pipe soldered to the lingual surface of the band; the ends of the gold wire resting upon the lingual surfaces of the first bicuspid and molar. The appliance is shown in detail in Fig. 8. After the tooth is in proper position, it is retained by means of a short piece of the gold wire, which passes through the tube, and extends upon the central, as seen in Fig. 9. This wire is kept in place by a small pin, which is tightly fitted in a very small hole drilled through both tube and one side of the wire, as shown. Fig. 10 shows two powerful cuspid teeth while being rotated by this method. It will be seen that the lever may be applied with an equal effect upon either the inside or outside of the arch, and in this case one anchor tooth is made to serve as anchorage for both levers. It is necessary to exercise care and judgment in the use of the powerful levers.

FIG. 8.

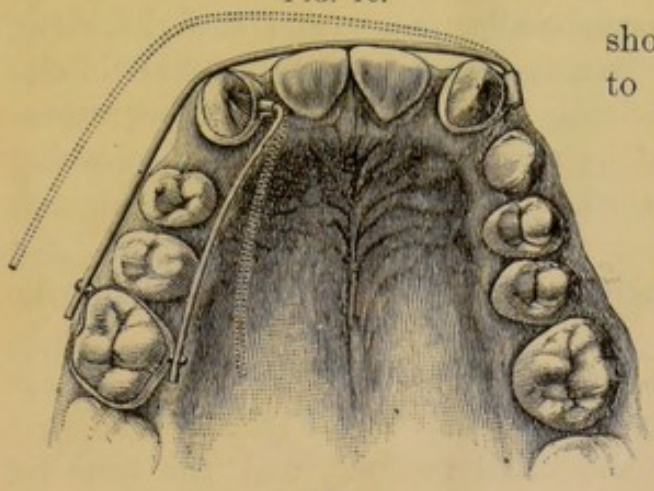


ROTATING APPLIANCE IN DETAIL.

FIG. 9.

RETAINER.

FIG. 10.

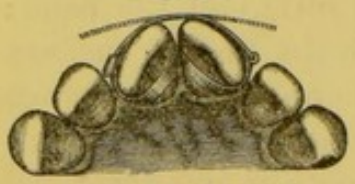


ROTATION.

First, the lever should not be allowed to touch at any point upon the teeth intervening between the tooth being rotated and the anchorage, lest the moving tooth be pried outward; second, care should be taken that the movement is not

accomplished more rapidly than the absorption of bone takes place, otherwise the tooth will be sprung outward by reason of the external plate of the alveolus which, being thinner, offers less resistance, and will be gradually bent outward.

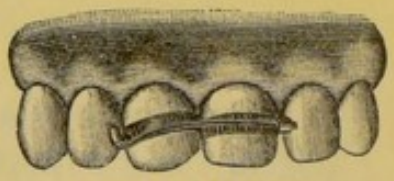
FIG. 11.



DOUBLE ROTATION.

When the teeth are to be rotated in opposite directions at the same time, as the central incisors, shown in Fig. 11, double rotation may be accomplished by one appliance. Both the teeth are banded, and a tube soldered to each band; one being horizontal and the other vertical. A piece of the lever "L," Fig. 1, is bent at right angles at one end, and then sprung into position, as seen in Fig. 12. The tendency of the wire to straighten itself will rotate both teeth at once. Recent experience has shown that a better way of applying the lever is to attach *both* pipes horizontally, using a straight lever, springing and sliding it into the last pipe in the same manner in which a bolt is slid in position in fastening a door.

FIG. 12.

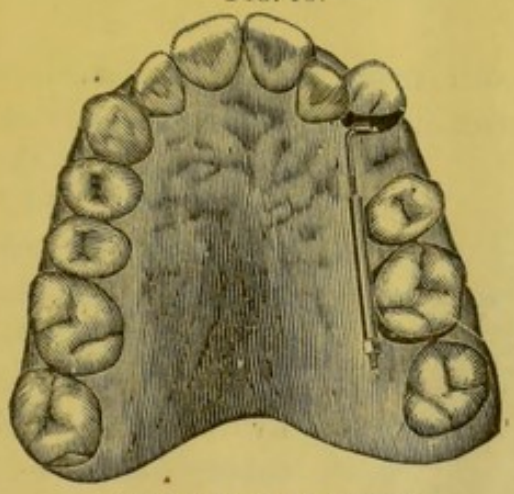


DOUBLE ROTATION.

The piano wire used in making this lever should never be heavier than No. 13, German. *Heavier will not do.* It may be necessary to occasionally remove and straighten the lever a little, in order to maintain the pressure. Should one tooth be rotated sufficiently before the other, further movement may be arrested by removing the band and soldering a lug on the lingual surface, resting against the lateral incisor. When in position, they are retained by substituting a piece of the non-elastic gold wire, "G," Fig. 1, for the spring wire.

The backward movement of teeth in the line of arch is accomplished by the appliance shown in Fig. 13. The first molar is banded in the usual manner, and the tube of

Fig. 13.



RETRACTION OF CUSPID.

the heavy traction screw, shown at "A" Fig. 1, rigidly soldered to the band. The cuspid to be moved is banded, and one of the short tubes, shown at "D" Fig. 1, is soldered to the band to receive the large traction screw, "A" Fig. 1. On turning the nut, traction is produced and the cuspid pulled or tipped into place. Fig. 4 shows a side view of the same.

The screw may be applied either upon the out or inside of the arch, and should the cuspid also require to be drawn into the line of arch, as well as backward, it may be accomplished at the same time, by bending the screw at the point where it enters the long pipe. It will gradually draw into the pipe as the tooth is moved back thereby accomplishing both movements.

The easiest way to adjust this appliance is to first cement the band upon the cuspid tooth. After the cement has become thoroughly set, the angle of the traction screw is hooked into the pipe, and the other band is now latched over the molar. The greatest care should be taken to make this attachment accurate, using the strongest cement.

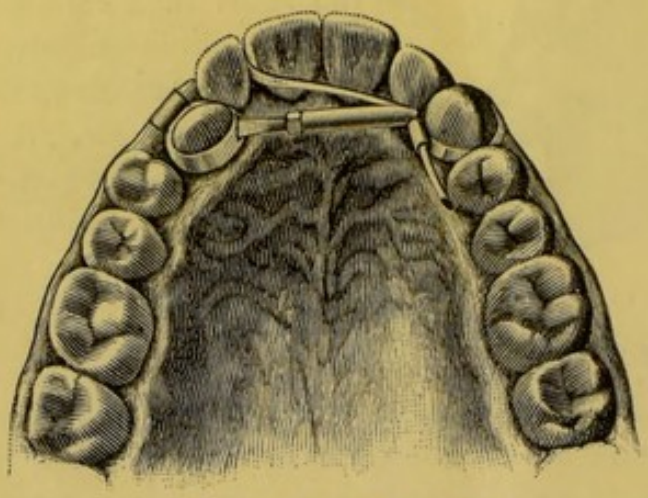
The nut should never be tightened enough at one time to strain the attachment. After the tooth is moved back, it is retained by the screw already in position, or that may be removed and a piece of the gold wire be inserted in its place.

The movement of a tooth forward in the line of arch is accomplished in the same way, only selecting teeth from the

opposite side to be used in overcoming the resistance of the teeth which are being moved.

The movement of a tooth from within, outward in the line of the arch, is shown in Fig. 14, and is accomplished by the jack-screw "J," Fig. 1. A firm anchorage for the resistance of the screw is obtained by banding and tubing the left cuspid and passing through the tube a piece of gold wire, long enough to extend to and rest against the adjoining teeth. The opposite cuspid to be moved is banded and a retaining tube, "R," Fig. 1, is soldered to the labial surface.

FIG. 14.

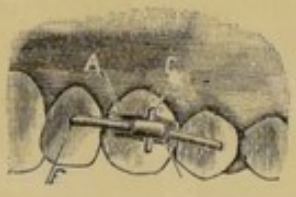


RE-INFORCED ANCHORAGE.

The lingual surface has a slot cut in it to receive the flat end of the jack-screw; the other end of the tube, in which the screw plays, is so notched with a file that it rests securely against the re-inforcement wire, and the tube against the lingual surface of the cuspid band.

Movement is accomplished by tightening the nut. After being brought into position, the tooth is retained by passing a short piece of the gold wire through the retaining tube on the labial surface, as shown in Fig. 15, which is held in place until the tooth has become firmly set in its new position.

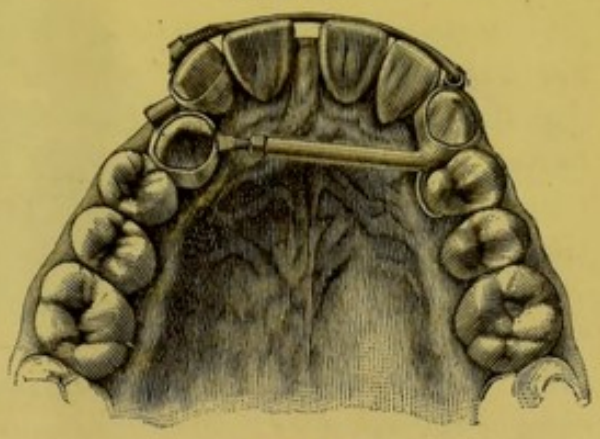
FIG. 15.



RETAINED.

Fig. 16 shows a cuspid tooth being moved outward. The base of the jack-screw is *soldered* to a band encircling the opposite cuspid, and re-inforced by a spur, resting against the first bicuspid, and also by the large traction screw which is hooked into a pipe, soldered to the labial surface of the band, and passing in front of the incisors through a tube, against which the nut works, soldered to a band on the labial surface of the lateral incisor.

FIG. 16.

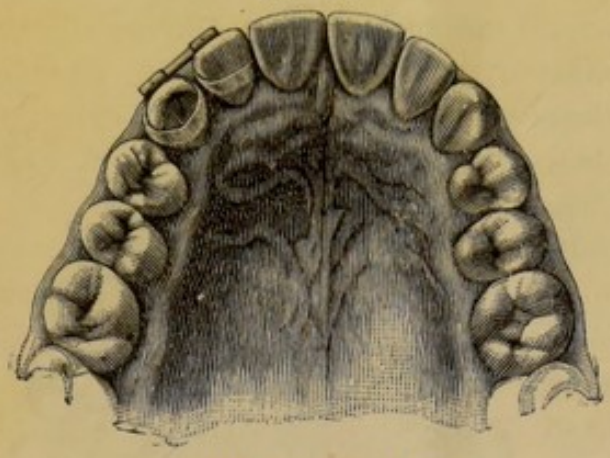


OUTWARD.

In this case, the left central and lateral were moved forward in the line of arch, thereby closing the space between the centrals, and, at the same time, providing space for the out-moving cuspid. The large screw was beaten flat and polished before insertion.

Fig. 17 shows the same case after completion. Another method of securing resistance for the base of the jack-screws, in accomplishing the outward movement, is shown in Fig. 18, where two central incisors are being forced out of in-lock, pipes were soldered to the palatine sides of bands, encircling the second bicuspids; the ends of a wire arch were slipped through these pipes,

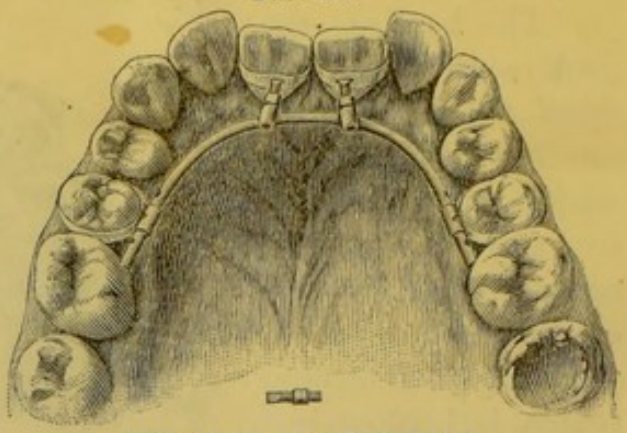
FIG. 17.



CASE AS COMPLETED.

and rested against the molars. Two short pipes were soldered to the wire arch, opposite the teeth, to be moved in lines corresponding to the direction of the movement.

Fig. 18.



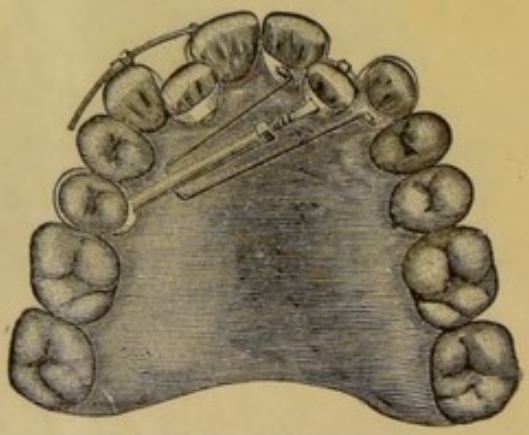
THE ARCH AS ANCHORAGE.

Two jack-screws were slipped into these pipes, the flat ends of the same were inserted in slots formed in the lingual sides of the bands encircling the teeth to be moved. The screws in this case were only one-fourth of an inch in length. After the nuts on the screws had traveled the length of the threads, they were again screwed back, and the wire arch moved forward and keyed into position by delicate pins, passing through holes in the pipes on the anchor teeth, as shown in the engraving. (The pipes into which the jack-screws rest should have been represented as being soldered to the upper side of the wire arch, instead of the lower, as shown in the engraving).

Another method of re-inforcing the anchorage in moving a tooth outward is shown on the right in Fig. 19.

The second bicuspid is made the principal anchorage against which the base of the tube is soldered. The band encircling the lateral incisor has a slot cut in it to receive the end of the jack-screw. The anchorage is re-inforced by means of a wire loop which hooks into tubes upon the adjoining central and cuspid, and

Fig. 19.



INCREASED ANCHORAGE.

is looped over a spur upon the body of the jack-screw tube.

The central and cuspid cannot be pushed outward on account of this re-inforcement, and the three teeth constitute the anchorage instead of one. The several parts of this appliance are shown at Fig. 20. Outward movement is accomplished by another simple method, shown on the left of Fig. 19, as follows: A strip of band material shown at "F," Fig. 1, is looped about the malposed tooth, the ends resting upon the labial surfaces of the adjoining teeth.

FIG. 20.

THE SEVERAL PARTS OF THE APPLIANCE.

To one end of this strip is soldered a tube "C," Fig. 1, placed vertically, while to the other end a similar tube is attached horizontally. Into these tubes the small traction screw "B," Fig. 1, is placed, being bent to conform to the shape of the arch, and being used in this case to push instead of to pull.

The parts of this device are shown separately at Fig. 21. Fig. 22 shows the teeth retained after the case was completed. Expansion of the arch is accomplished by banding and tubing the first and last teeth of those to be moved, on each side, and connecting them by means of steel wire passing through the tubes.

FIG. 21.

DEVICE FOR OUTWARD MOVEMENT.

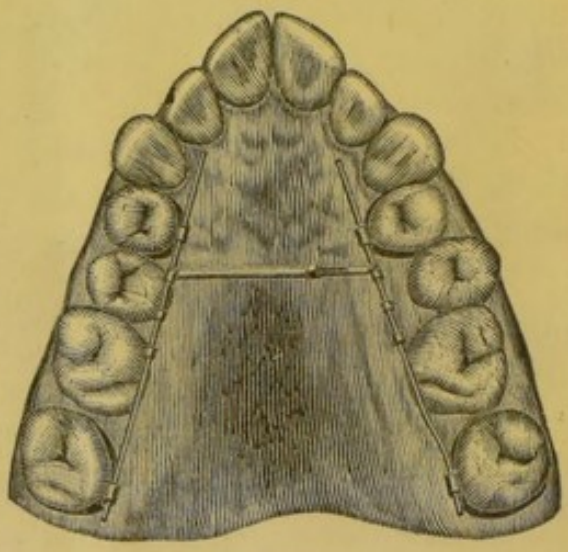
The jack-screw is then placed in position across the arch from wire to wire. Collars or short tubes are soldered to the wires at intervals to keep the screw in proper position. These collars must be attached by soft solder, that the temper of the steel wire may not be disturbed. The jack-screw may be moved forward or backward according to the varying requirements of the case.

FIG. 22.

RETAINED.

Before placing in position the wires which pass along the sides of the arch they should be bent to correspond to the shape of the sides of an ideal arch, or exactly as we wish the teeth to be arranged after the desired position is gained. The appliances in position are accurately shown in Fig. 23, with the exception that the tubes attached to the *posterior* bands should be nearly perpendicular instead of horizontal.

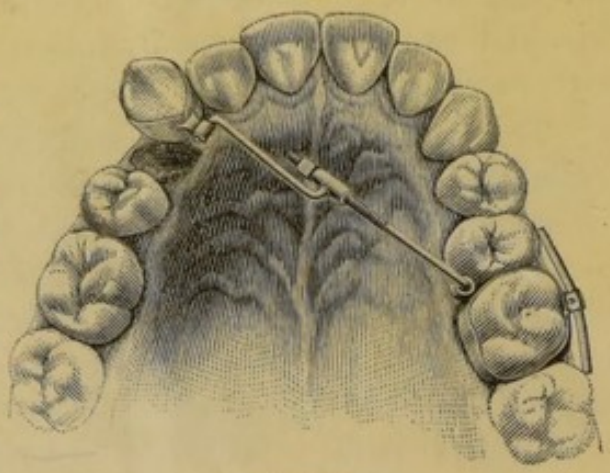
FIG. 23.



EXPANSION.

The movement from without, inward into the line of the arch, may be accomplished, as shown in Fig. 24. The cuspid tooth is banded and a piece of the gold wire bent sharply at right angles hooked into a pipe, soldered to the lingual surface. The other end of the wire is soldered to a pipe through which the small traction screw is slipped and against which the nut works.

FIG. 24.



INWARD.

The other end of the traction screw is hooked into a pipe soldered to a band encircling the first molar. The anchorage of this tooth is further re-inforced by a piece of the gold wire, which is slipped through a tube soldered to the buccal surface of this band,

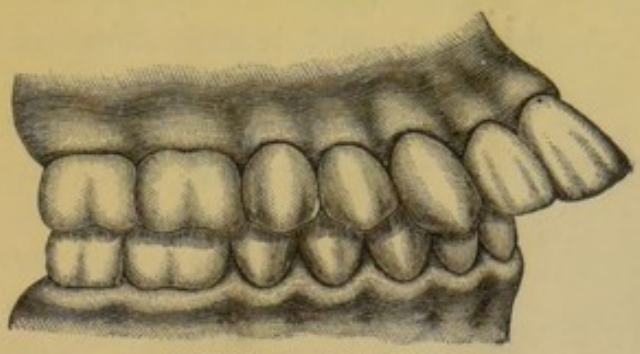
the end of the wire resting against the adjoining teeth. Retention is accomplished in a manner similar to that shown in Fig. 38.

Another very nice method of gaining anchorage for the small traction screw in drawing teeth inward into line of arch is illustrated in Fig. 18, using the wire arch to pull to, instead of pushing from, as illustrated.

In using the traction screw in this way, it should be, of course, cut very short, so that the movements of the tongue may be interfered with as little as possible; and if the tongue be abraded by the end of the screw as it emerges from the nut, a very nice way of protecting the tongue, as in all similar cases, is for the patient to lay over the end of the screw a small piece of the very common article known as chewing gum.

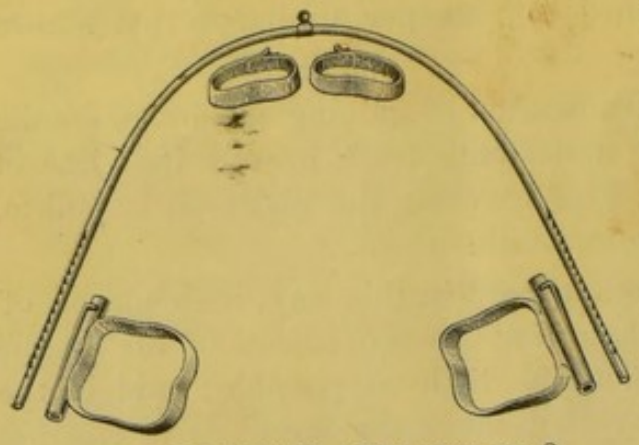
With the above appliances, any form of irregularities may be treated. There is one form, however, characterized by excessive prominence of all the superior teeth, and illustrated by Fig. 25, in which the force required for moving backward all of these prominent teeth is usually too great to be borne by the posterior teeth as anchorage; and, owing to this insufficiency of anchorage, the usual result is that the molar teeth are frequently tipped forward, and faulty occlusion established, without accomplishing the desired result. On this account I have devised an appliance to be used in these special cases, the anchorage of which will be transferred to the back of the head by means of the occipital bandage. It is known as Appliance No. 2, and shown in part in Fig. 26. It is

FIG. 25.



EXCESSIVE PROTRUSION.

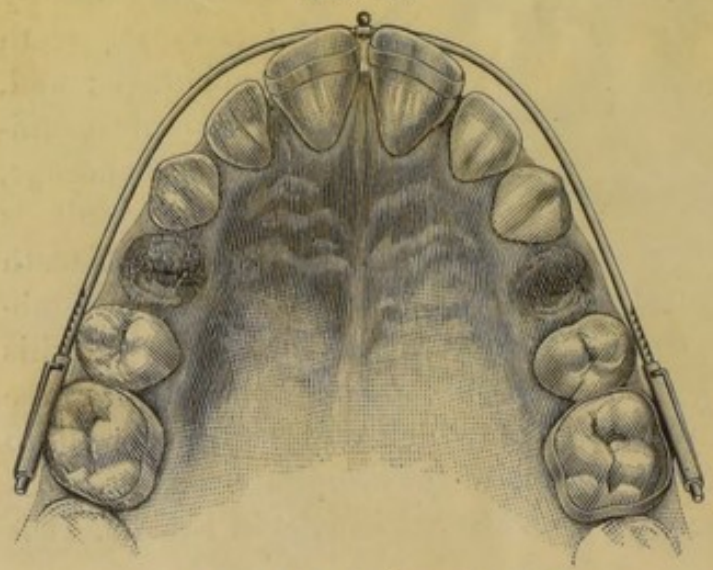
Fig. 26.



PART OF ANGLE'S APPLIANCE NO. 2.

made and applied as follows: The first molars are carefully and accurately banded. Pipes, $\frac{5}{8}$ of an inch in length, are soldered on the buccal surface of the bands, on a line parallel with the gum. A wire of hard-drawn, platinized gold, about No. 19 gauge, and long enough to encircle the dental arch, and carefully bent to conform to the shape of the same, *provided* the dental arch to be correct in form; but if it be contracted and the teeth occupy irregular positions, no attention is paid to the form of the existing arch, but an ideal arch is formed for the case; or, in other words, the wire arch is bent to exactly the form to which we wish the teeth to be arranged when the operation is completed. The ends of the ideal arch are now slipped through the pipes on the molars. The anterior part of the arch is kept from sliding up and impinging upon the gums by resting in suitable notches formed in the delicate bands encircling and cemented to the central or lateral incisors. It is shown in position upon the teeth in Fig. 27.

Fig. 27.



APPLIANCE NO. 2 IN POSITION.

Fig. 28 represents a traction bar used for conveying the

FIG. 28.


TRACTION BAR.

force from the occipital bandage and distributing it to the wire arch. A spur or standard will be seen in the center of this bar, provided with a socket in the end, which, when in position, engages a small ball soldered to a delicate tube encircling the center of the wire arch, as is shown in Fig. ~~24~~ 27. If the reader is familiar with the appliance so far described, it will be seen that the force received from the occipital bandage is distributed to the wire arch through the ball and socket joint. The ends of the traction bar may, therefore, be moved in any direction without interfering with the pressure from the bandage. The advantage of this attachment is that, in consequence of the freedom of motion, any jar or shock upon the traction bar will not be transmitted to the tender teeth. As the bandage and bar are to be worn only at night, shocks from contact with the pillow would be very liable to occur and occasion much pain, were it not that the bar is provided with this freedom of movement. This is a point of advantage which I think all will appreciate, and one possessed by no other device with which I am familiar. The usual method is to attach the traction bar, or its equivalent, to a swedged or vulcanite cap covering, and firmly resting against all the teeth to be moved.

As the heavy rubber ligatures of the bandage act during the night only, provision must be made to hold through the day what is gained at night. This is accomplished by the spring-dogs attached to the pipes, fastened to the bands encircling the anchor teeth, catching into the delicate notches in the wire arch, as they pass through the pipes, as shown in Fig. 27. This effectually prevents the loosened teeth from

springing back and interfering with the healing process. Another advantage of the device is, that not only the prominence of the teeth is reduced, but teeth that are irregular are gradually forced to take regular positions and conform to the shape of the ideal arch; something impossible with devices having fixed caps of vulcanite or gold. Still another advantage is, that if the arch needs expanding, as is frequently the case, it may easily be accomplished at the same time the teeth are being moved backward, by lacing to the wire arch such teeth as need to be moved outward.

For the bandage proper, I greatly prefer the common silk traveling cap, shown in the engraving, or the knit jersey cap, to the contrivances usually used for this purpose, as these fit the head snugly and distribute the force exerted by the strong ligatures over more surface, and are, consequently more easily worn. Two ligatures should be attached to the cap, on each side, one above the ear, and one below the ear, as shown in Fig. 29. If the bands be of equal width, the force will be exerted in the direction of the meatus of the ear. This is the point to which, in most cases, the force should be directed. In some cases, however, the teeth should be compressed in their sockets as well as drawn backward. This is easily accomplished by dispensing with the ligature below the ear, using the upper only, but of double strength, attaching it at a point on the cap as far forward as desired.

FIG. 29.

OCCIPITAL ANCHORAGE.

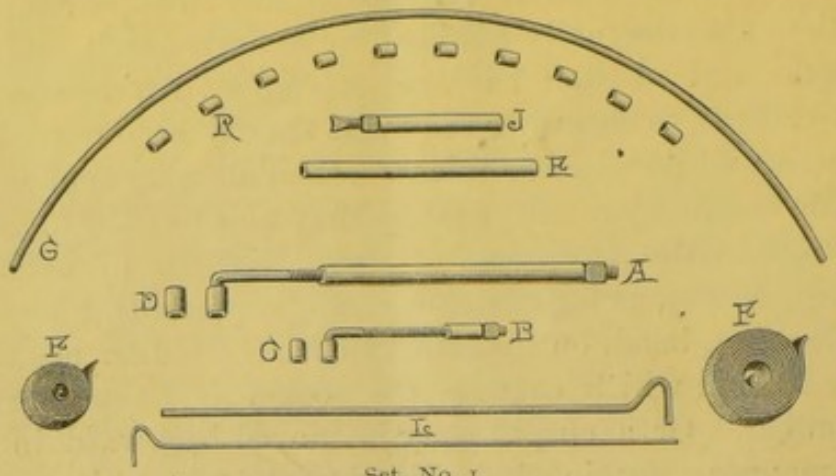
After the teeth have been moved into the desired position, they are effectually retained by the wire arch, and the head gear and traction bar are, of course, dispensed with. Extra care as to cleansing the teeth should be observed by the patient while wearing this, as well as all other appliances.

The traction bar and bandage may also be used to great advantage in the movement of single teeth, or in assisting other appliances, as for example a single prominent incisor, encircled by a band, on the labial surface of which has been soldered a ball which engages the socket in the spur of the traction bar. Or a cuspid may be moved backward in the same manner; but in this case, the spur should be moved from the center towards the end of the traction bar, and the ligatures attached to the long end of the bar should be of less strength.

The bandage and bar may be used to assist the appliances shown in Figs. 11 and 12, in double rotation. Should these teeth begin to show undue prominence as they rotate, by reason of pressure from the adjoining teeth, the bar and bandage, applied for a few nights, will effectually remedy this annoyance. It may also be used to advantage, in the same manner, in assisting the lever in single rotation.

Other appliances of this bandage and bar might be given, but they will suggest themselves to any one in whose hands the appliances may be.

# DR. E. H. ANGLE'S REGULATING AND RETAINING APPLIANCES.

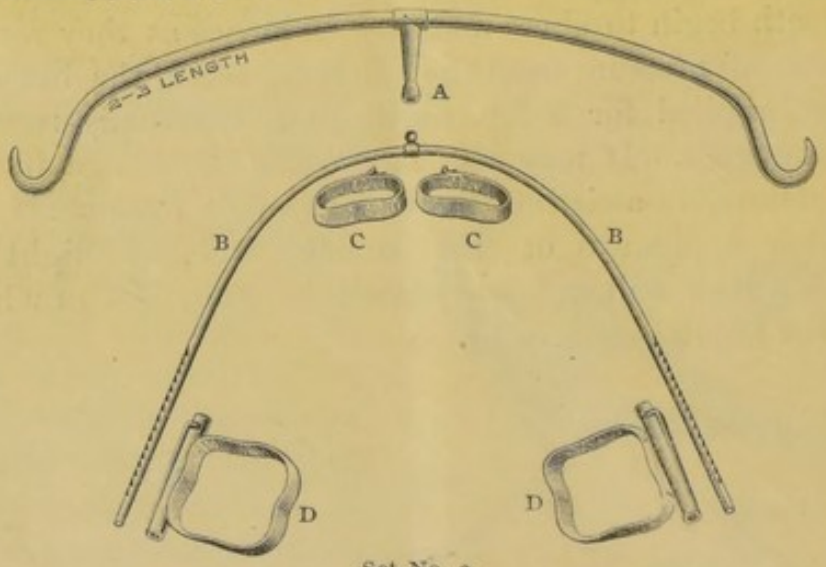



Set. No. 1.

(PATENTED MARCH 5, 1889.)

**PRICES.**

| | |
|---|---|
| Set No. 1, complete | $5.00 |
| Traction-screw, A and D, complete | 1.25 |
| Traction-screw, B and C, complete | 1.00 |
| Jack-screw, E and J, complete | 1.00 |
| Coils of band material, F, each | .50 |
| Retaining wire, G | .50 |
| Rotating levers, L, per dozen | .25 |
| Retaining pipes, R, per set of 12 | .75 |




Set No. 2.

(PATENTED NOVEMBER 6, 1889.)

**PRICES.**

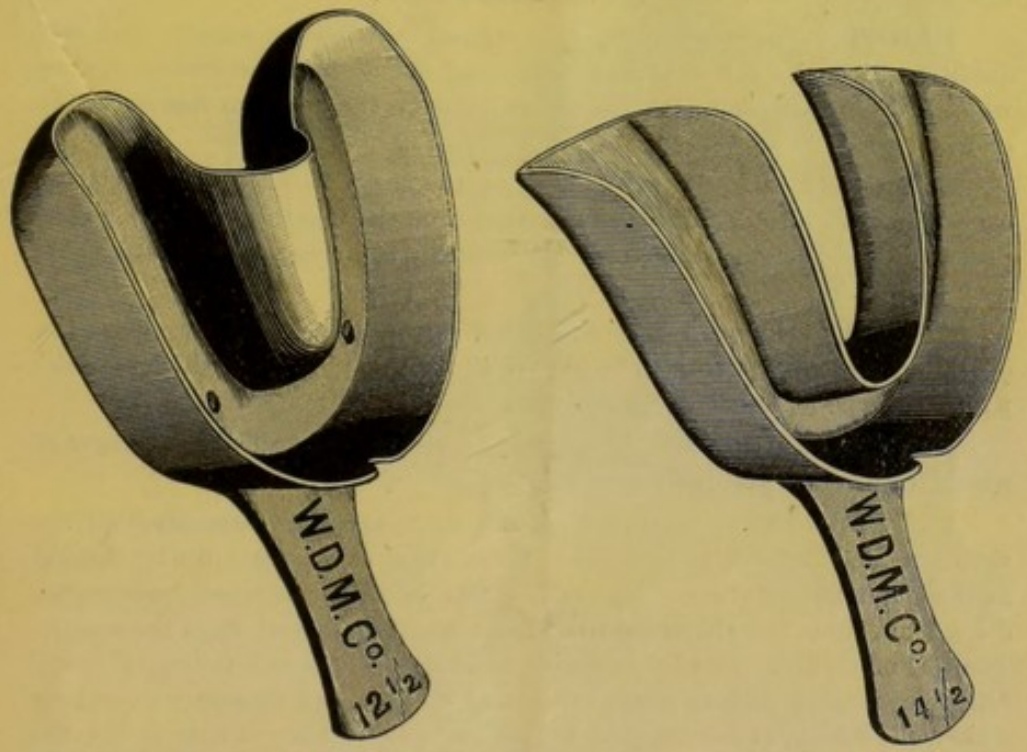
| | |
|---|---|
| Set No. 2, complete | $6.50 |
| Traction bar, A | 2.00 |
| Wire arch, B | 1.50 |
| Anchor-band pipe and spring-ratch, D, each | 1.50 |
| Extra band material for making bands C, C, each | .50 |
| Heavy elastic bands for head cap | .40 |

We send with each set a fully illustrated pamphlet of twenty-three pages, containing full instructions. This system is heartily recommended by those who have had the opportunity of using the appliances, and we can endorse these recommendations, as we feel assured the system is the *best* and *simplest* yet devised.

**THE WILMINGTON DENTAL MFG. CO., Sole Agents.**

# UPPER AND LOWER
# IMPRESSION CUPS.

(Suggested by Dr. E. H. ANGLE.)




Dr. Angle devised these cups specially for regulating purposes, as he found those at present on the market ill-adapted for procuring the exact models required.

The sides of these cups are high and strong, running to the posterior portion of the cup. The upper cup is extra high on the palatine surface, and the posterior portion has low sides.

Nos. 12½, 13½ and 14½ uppers, range from the largest to the smallest. No. 12½ is same size as No. 12 flat-bottom cup.

Nos. 14½, 15½ and 16½ lowers, range from the largest to the smallest. No. 14½ is same size as No. 14 lower flat-bottom cup.

PRICE, - - - each, 35 Cents.

THE WILMINGTON DENTAL MFG. CO.

# DR. TEAGUE'S IMPRESSION COMPOUND.

## A Substitute for Plaster in All Cases,

but especially advantageous where a die is wanted for the swaging of a plate.

The following points of **superiority** over plaster as an impression material will appeal forcibly to every practitioner:

**FIRST.**—The compound, when mixed, possesses a smooth and oily quality, which allows it to spread freely and evenly over the surface against which it is pressed, and into the spaces between the teeth, or fissures in the crowns.

**SECOND.**—It will not adhere to the teeth, as is so frequently the complaint with plaster, and when removed from the mouth it presents a most perfect counterpart on a smooth, glossy surface, a result not possibly attainable with plaster.

**THIRD.**—In separating the impression from the plaster model, the operation is greatly facilitated because of the contrast of color (which is pink) with white model, greatly lessening the liability to cut or scar it.

**FOURTH.**—Its taste is less unpleasant to the patient, advantages of which feature it is needless to comment on.

**FIFTH.**—Its use entirely dispenses with moulding sand, and all the vexations and difficulties incident to the making of a perfect die by the old method, and the results are accurate, as well as easily obtained, because the die is made from the **impression** direct, as it is removed from the mouth. There is no making of a plaster model, building up here and taking off there, filling depressions, making cores, varnishing, etc., etc., as is necessary in making a zinc die, which, at best, cannot be perfect when done. There is but the simple operation requiring little more time than making a plaster model, and when cast, a model is obtained with every **line, undercut, tooth** and **rugae** sharp, distinct and **SMOOTH.**

The manipulation of Dr. Teague's Compound is precisely the same as plaster, so there is nothing new to learn in its use.

**Put up in Tin Boxes, at 50 cents per Box.**

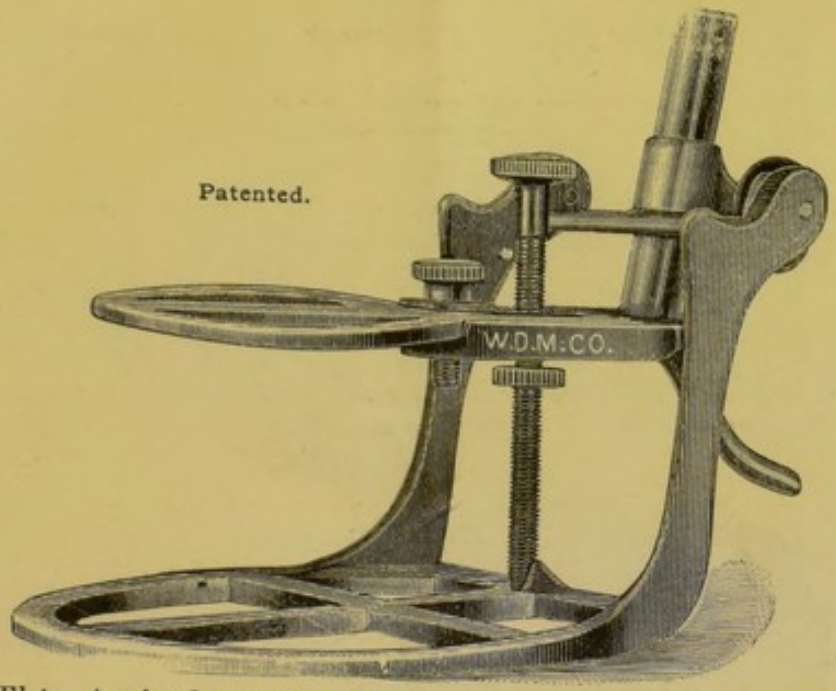
**As the Compound weighs over 4 lbs., when packed ready for shipment,**

**WE CANNOT SEND IT BY MAIL.**

## THE WILMINGTON DENTAL M'F'G CO.

# DR. J. W. MOFFITT'S
# Anatomical Articulator.

Patented.




This Articulator has its movements corresponding to those of the natural jaws, the arrangement of the lower to the upper plate is such that any false position of the bite may be corrected, and at the same time the arc of the circle of the lower jaw in relation to the upper will be secured as in the mouth, thus assuring a correct articulation without the necessity of grinding the teeth after they are mounted. It is adapted to either partial or full cases.

**PRICE,** { **In plain Brass, . . . . . $2.00**
**Nickel-plate, fine polish, . . . 3.00**

## DENTAL PLASTER.

We sell only fine, selected plaster, sending it directly from the mills, thus insuring its freshness. State whether you desire it for models or taking impressions, we always send the former, unless otherwise ordered.

| | | | |
|---|---|---|---|
| **8-Quart Can, . $0.90** | | **Quarter-Barrel, . $1.60** | |
| **12 " . . 1.15** | | **Half " . . 2.50** | |
| **16 " . 1.40** | | **One " . 3.50** | |

These prices are for plaster from our Philadelphia depot, from New York or Chicago the additional freight will be added. When shipped by freight, 25 cents will be charged for cartage.

**THE WILMINGTON DENTAL M'F'G CO.**