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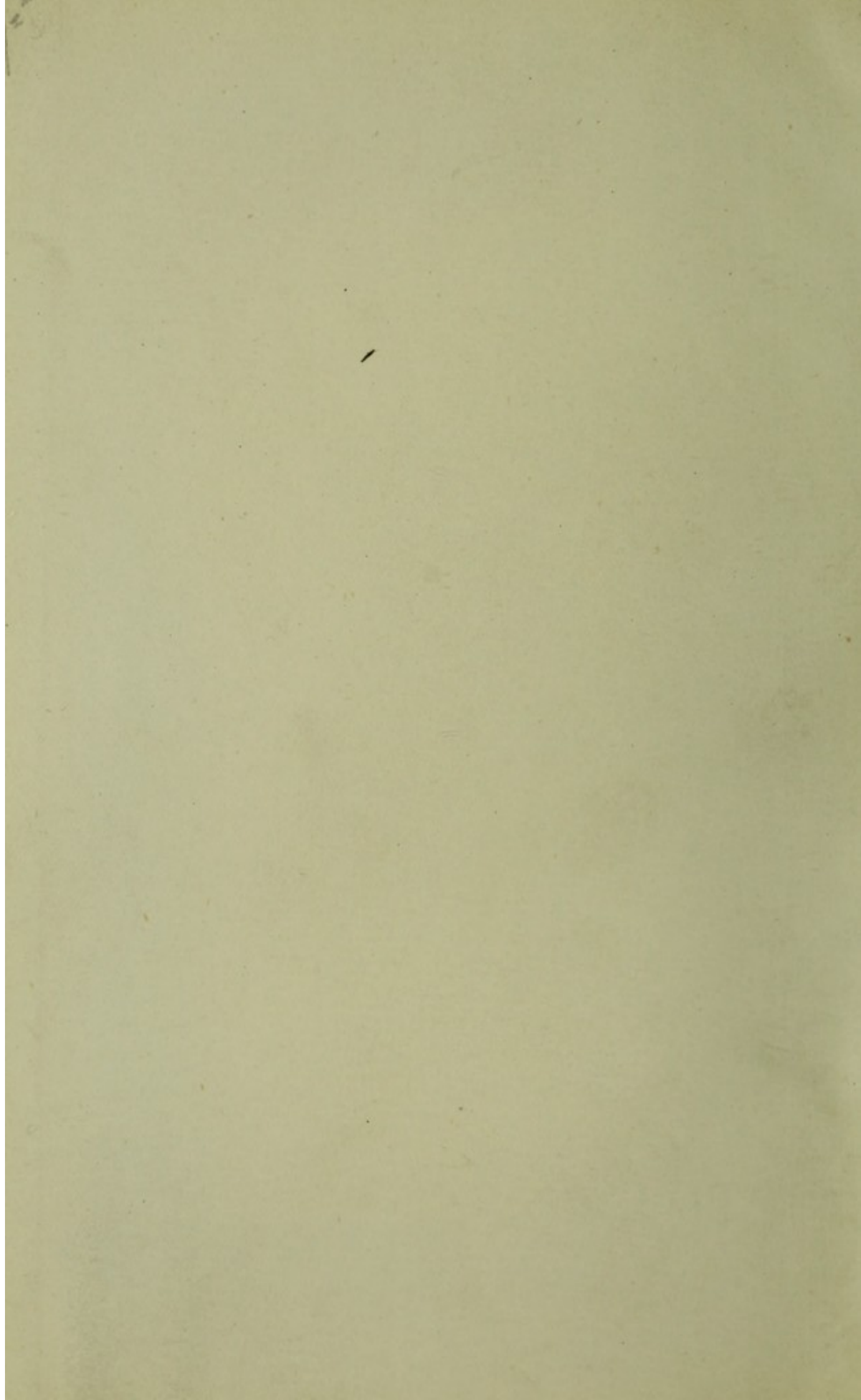


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DENTAL MECHANICS.

PART IV.

DENTAL IRREGULARITIES.

BY

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WITH NUMEROUS ORIGINAL ILLUSTRATIONS.

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DENTAL MECHANICS :

PART IV.

APPLIANCES AND DEVICES FOR THE CORRECTION OF DENTAL IRREGULARITIES.

Considering a work on dental mechanics as incomplete without some reference to guide the student as to the nature, structure, and object of the appliances used for the treatment of dental irregularities, the author is led in this section to bring before his readers some of the devices he has found most useful, both in hospital and private practice ; and while he does not lay claim to any originality of treatment, he would try to draw attention to those simple forms of appliance that are most likely to be worn and tolerated by the patient, thus conducing in a great measure to the success of the operation.

There is no branch of our art that calls for the exercise of mechanical skill and ingenuity in a greater measure, than that devising the means whereby one can transform an irregular and crowded condition of the teeth, and malformed dental arches, into perfect order and symmetry. Very few of these cases are alike in detail; each requires, as it were, to

be studied and treated on its own merits. For the means to be adopted one must be guided by several very important considerations.

The first is to ascertain the willingness of the patient to submit to the various little troubles incidental to the treatment and the co-operation of the parent or guardian is also essential to ensure that the instructions given by the dentist are carried out in an intelligent manner.

The next business is a careful inspection of the mouth and to determine which teeth to retain and which to remove ; we must also well consider if the teeth we propose to remove might be made useful for anchorages prior to so doing.

Having taken the impressions, and cast the models, we have now to consider the nature of the plate or appliance.

Experience teaches us that the simpler these devices are, provided they effect the purpose they are intended for expeditiously, the more likely they are to be worn faithfully by the patient. The first consideration is, that they should not encumber the mouth so as to prevent the patient masticating his food ; the second is, that for hygienic reasons they should be easy of removal so as to be kept scrupulously clean ; and the third, that there should be no chance for the patient to insert them wrongly.

As the majority of the cases of dental irregularity are due to a contracted condition of the dental arches, the operation of spreading or expanding these arches becomes one of the most important one has to perform. We have in these cases a crowded condition of the teeth, some overlapping the others, some perhaps crowded out, either inside or outside the alveolar ridge, but in each case, if our object is to make the teeth assume their normal positions in relation to the

others, we must in the first place make room for them, by using some appliances that will keep a sufficient pressure on the inner sides of the alveolar borders that will enlarge or spread them to the extent necessary.

For expanding a contracted arch, one of the most effective and simplest methods is to use a split vulcanite plate joined together by a screw running in two german silver tubes vulcanised in the substance of the rubber. As these tubes are usually covered by the vulcanite, german silver of the best quality will be found a very suitable material to make them of; there is a further advantage in using this material, that it can be procured in sizes such as we require for the purpose.

In order to make these appliances, it is necessary to provide ourselves with a screw plate and taps. Armed with these, we first run a thread on a piece of german silver wire about an inch long. The next process is to tap the tube, this may be accomplished by taking a piece say about one and a half inches long, into one end of which a piece of wire is placed; we can now hold the tube firmly in the vice without danger of crushing it, during the process of tapping. The steel taps for doing this can be conveniently held in a small hand vice, and then screwed with a to and fro movement into the tube, using plenty of oil.

When a sufficient length of tube has been tapped, the german silver screw should be screwed into it to ascertain if it works smoothly, it is then removed and the tube sawn through with a fine saw into two equal parts, these are then replaced on the german silver screw, and the screw and tubes filed or cut to the length required. A few irregular marks with a file will be sufficient to retain the tubes in an upper

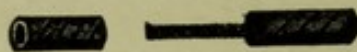


Fig. 1

vulcanite case, but in a lower when the screw and tubes are prepared, wings of german silver are soldered to the tubes.

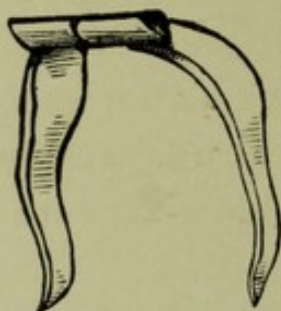


Fig. 2.

These wings should be close to the necks of the teeth as far at the distal extremity of the anterior molars.

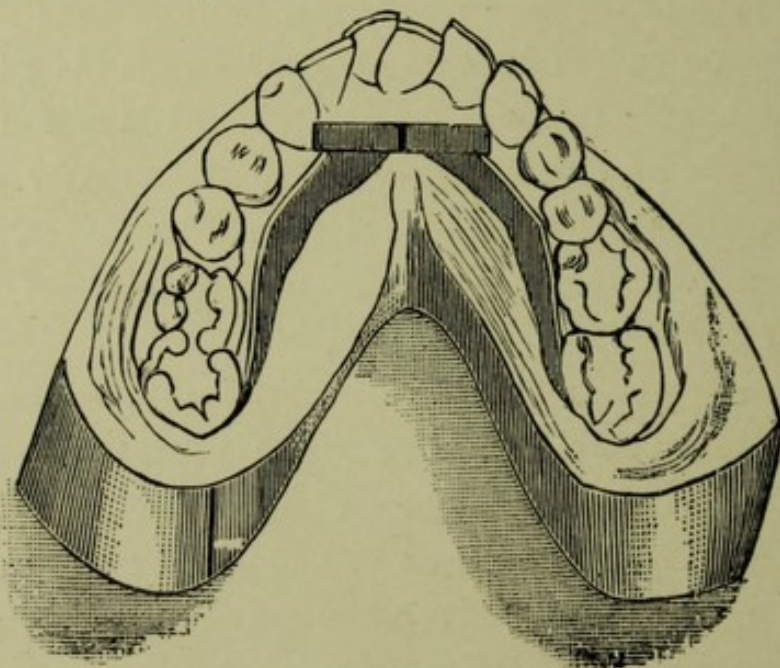


Fig. 3.

When soldering the wings on it is safer to withdraw the screw from the tube or else lubricate it with a little whitening to prevent its being fastened to the tube. The screw and tubes may be gilded prior to insertion in the vulcanite if thought necessary.

The advantages of a screw such as described are, that it retains its steadiness and usefulness much longer than those inserted in vulcanite without the tube, and also, when the plate has been expanded to the extent of the screw, it can still be partially unscrewed from the opposite side of the case to allow for further expansion, or a new and longer screw can be inserted without making a fresh case. Being covered by the vulcanite, there is nothing to interfere with or to cause irritation to the tongue.

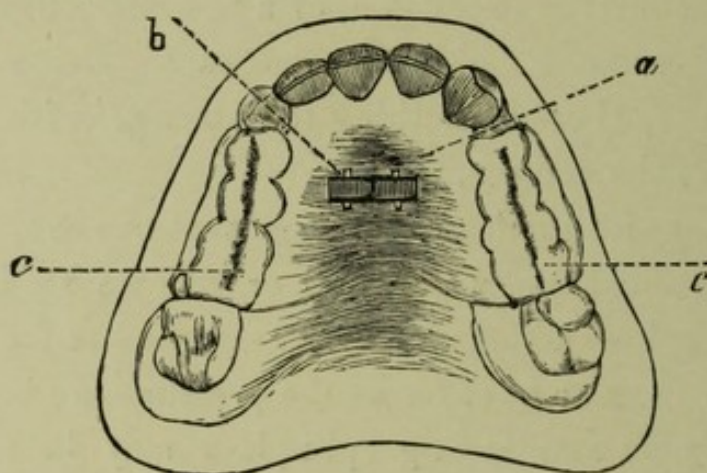
It has the still further advantage that one can, with safety, send the patient away for four or five weeks, if necessary, after giving instructions for the unscrewing of the plate about every four days or as often as the pressure can be tolerated.

A very neat and strong split-plate may be made in the following manner :

Get zinc dies and lead counter of the model, and swage up No. 7 gold or dental alloy plates to cap the molars and bicuspidis where necessary. (See Fig. 4). The plates should overlap the crowns of the teeth about one-eighth of an inch, and before the final swaging, these overlapping edges may be nicked with a piercing saw or pair of sharp shears, after which they receive the final swage. The plates are now to be cleaned and annealed, and after the overlapping edges are turned outwards slightly, to allow the vulcanite to take a good hold of them, they are ready to adjust to the model.

We now take the model, warm it, and paint it with chloro-

rubber over every part where the plate has to extend, likewise under the edges of the plates. These latter are now warmed and placed in position. A sheet of rubber is now cut roughly to a pattern made on the zinc model, and having been softened either on a hot plate or over a spirit lamp, it is carefully pressed into the palate, and up to the edges of the plate, other smaller pieces are then adapted to the buccal aspects and pressed around the edges of the plates, and afterwards smoothed by being rubbed with a pledget of wool soaked in chloroform.

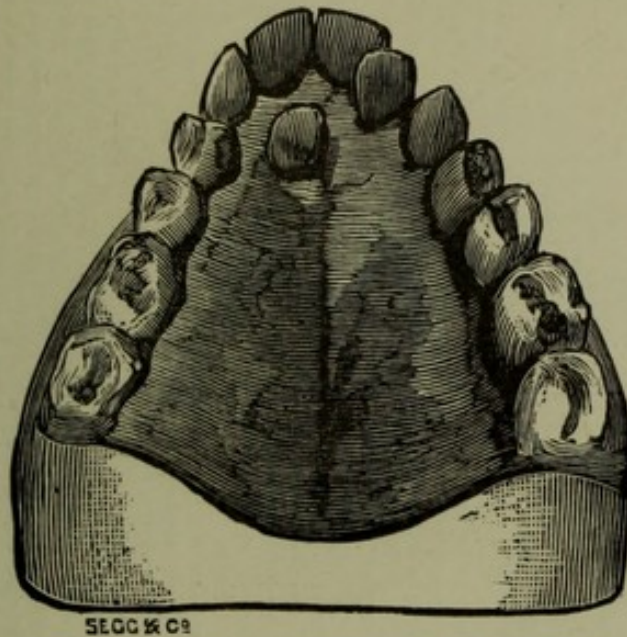


(Fig. 4). a Rubber plate.
b Screw tube.
c c Dental Alloy plates.

We have now to insert the screw and split tubes into the rubber in the palate of the case (Fig. 4, b), to do this it is first necessary to build up pieces of soft rubber the required height, then, after warming the screw to press it into the position required; it should be perfectly straight across the palate. We next take more soft rubber, build it up around, and just to cover the screw, and then finish up the palate with chloroform the same as the sides. When this has been done, one should take a warm knife and make a deep cut in the

rubber plate extending from behind the front teeth to the posterior edge of the palate. The plaster running into this cut, enables one when the case is finished to divide it more easily.

The case is now ready to be inserted into the flask for vulcanizing. As all the packing of rubber has been accomplished, it only remains to dip the model into cold water, and then having mixed up a sufficient quantity of plaster of Paris to fill the flask, the case is inserted and the flask is closed.

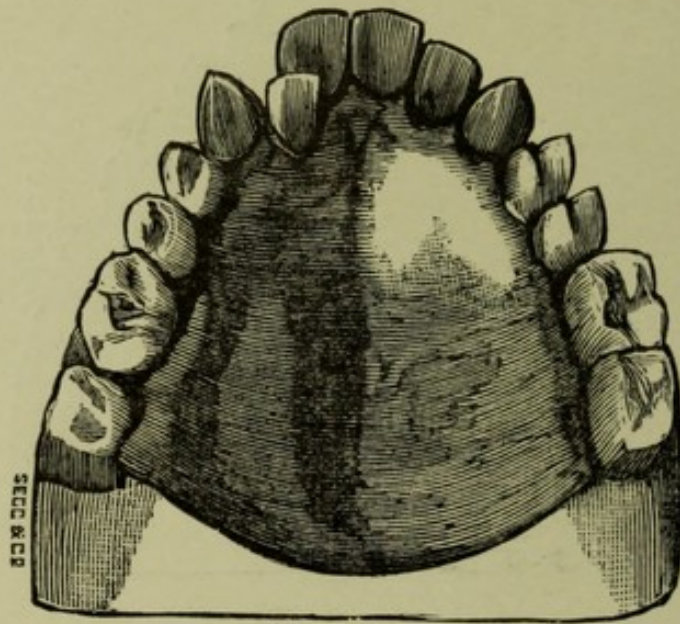


(Fig. 5). Original condition of the Mouth.

As a rule the rubber itself may cover over the teeth, and be cut away if found necessary to allow the cusps of the teeth to appear through; this however, weakens it considerably, and the portions of the case in the buccal region are apt to break away. There is no fear of this occurring when a plate is swaged up to cap the teeth.

In the foregoing description the making of an upper case has only been described, the same course may be adopted for

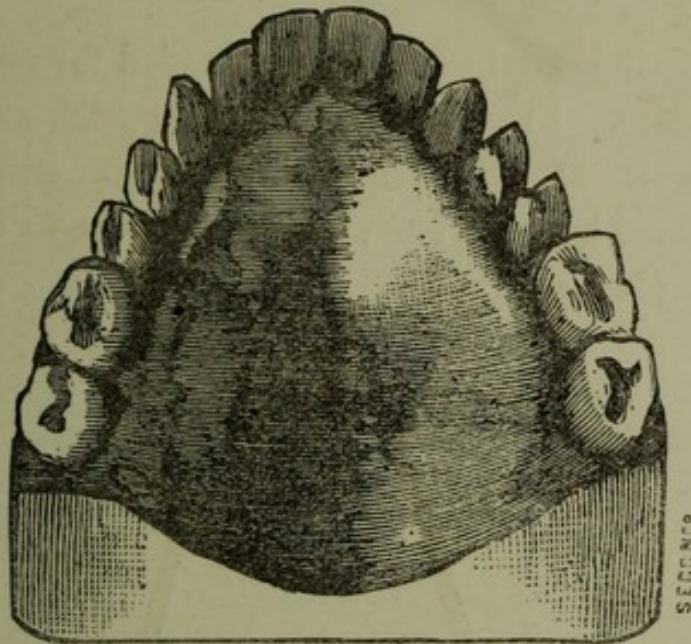
the lower, the only difference being that the screw instead of crossing as in the upper, is placed close behind the front teeth, and wings of German silver are soldered to its distal extremities, and extending to the anterior molars, (see Fig. 3), in order to give strength and rigidity to the ends of the rubber plate, and equalize the expanding power of the case. The packing of the rubber on the model, and subsequent finishing off with a warm instrument and chloroform, is the same as in the first mentioned case.



(Fig. 6).

After being vulcanized, and cooled down, it is removed from the flask, then filed up and polished before attempting to saw it in half. When this is done it is ready for the mouth. As a rule the fit of a case made on this principle is perfect, and the articulation is not materially affected by the plate covering the teeth, there is also no fear of a fracture as occasionally happens, when the vulcanite itself is brought over the teeth.

Figs. 4, 5, 6, will shew the effects of a screw plate such as described, with but a small amount of attention from the dentist, and that only towards the completion of the case when the right lateral was drawn into position, by lacing with rubber dam.



(Fig. 7). Case when completed.

When inserting such a case in the mouth, the patient should be directed to wear the divided plate for a short time before commencing to separate it, after which he may make one turn of the screw every third or fourth day, so as to ensure constant pressure being kept up. He should also be advised to report himself in from three to four weeks' time or longer, according as a small or large amount of expansion is required, and if the patient has been faithful and performed his part of the contract, a great improvement ought to be visible.

When a patient has to come a long distance, this method of treating a contracted arch will be found peculiarly advantageous, at any rate from the patient's point of view.

Another method for expanding the Dental Arch is by means of a split vulcanite plate with a spring in the centre, known as the Coffin plate. This is also most effective and reliable, but certainly requires greater attention on the part of the dentist, as the spring is apt to get broken if meddled with by the patient.

The following method is recommended for making a split vulcanite plate. First dry the plaster model, and cut out a pattern the size of plate required, and while still warm paint the former with a solution of chloro-rubber to the extent of the rubber plate required.

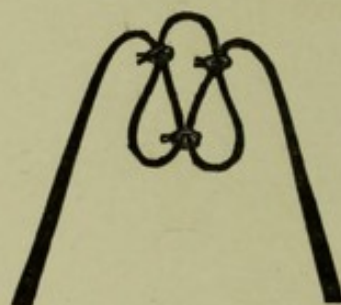


Fig. 8.

A piece of rubber is now cut out according to the pattern, and is softened on a hot plate and pressed into the deeper portions of the palate, afterwards to the teeth and alveolar ridges. A piece of pianoforte wire is then bent to the required shape (Fig. 8) with suitable round-nosed pliers, and after coating the free ends, which are to be inserted in the vulcanite, with tin in order to prevent the sulphur from acting on the steel, they are pressed into the soft rubber and secured, the spring being thus close to and on the surface of the plate, which should be covered with a layer of tin foil to prevent the sulphur in the rubber from acting on the wire. Before inserting the spring into the rubber it may be held together with binding wire. It is then flaked and vul-

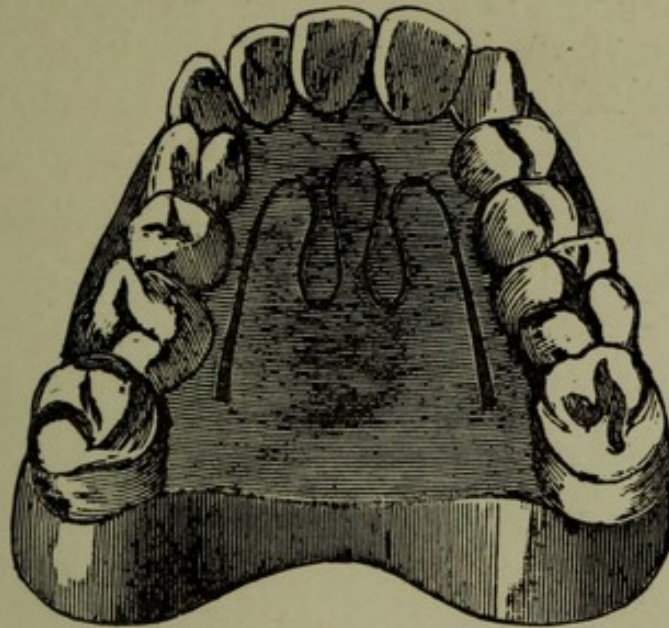


Fig. 9.

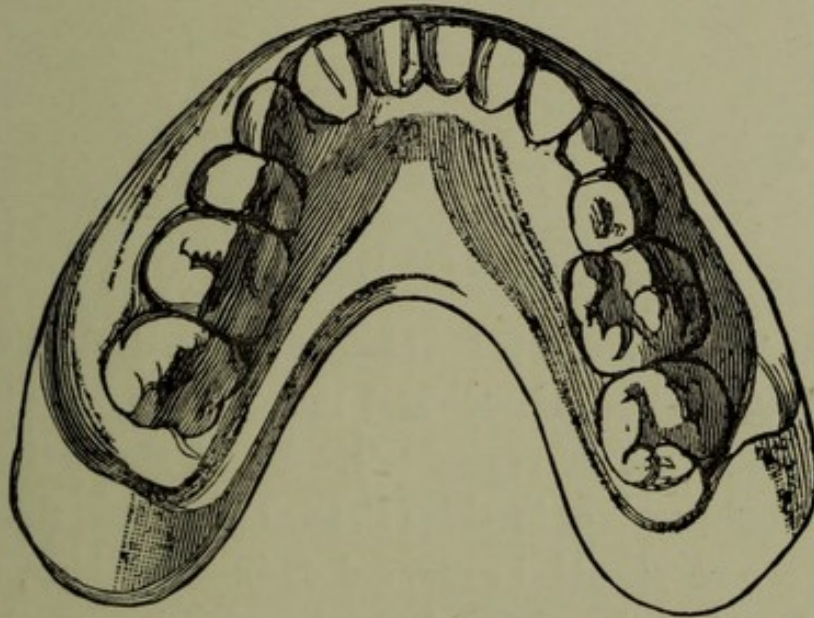


Fig. 10.

canized as directed for the screw-plate previously described. This plate when filed up and polished, may in some cases be worn for a day or two before dividing it, as it enables the

patient to get used to the feel of the case in the mouth before any pressure is applied. For tinning the ends of the wire for insertion in the rubber, a little tin or soft solder may be melted on a piece of brass or copper plate, having a slight indentation hammered in it to prevent the tin flowing about.

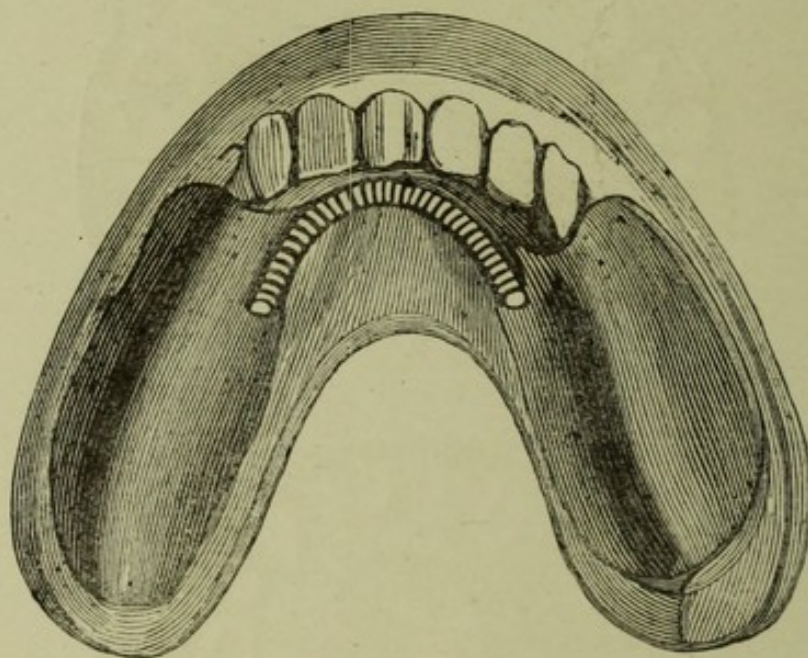


Fig. 11.

The ends of the wire after being flattened should be just touched with zinc chloride and then dipped into the melted tin; this will coat and protect it. Fig. 9 shows the position of the Coffin spring in the palate of the case, the flattened ends of course should be covered up in the rubber, and care should be taken that the spring takes the slant of the palate, and that it does not stick out at the back part, to get into the way of the tongue.

Fig. 10 is the model of the lower jaw of a young lady about fifteen, whose molars and second bicuspid slanted into the mouth to such an extent that it was only possible to take the

impression in sections. In order to make a case that should admit of easy removal and insertion, to correct the position of the offending teeth, two side-pieces capping the molars and bicuspid were made ; these were connected by a pair of spiral springs, (Fig. 11) which were vulcanized into them. Fig. 12 is a view of the device off the model.

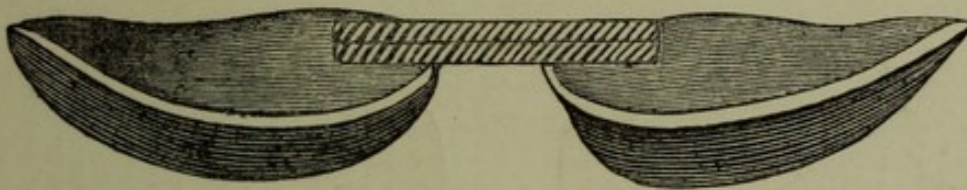


Fig. 12.

Very good results followed the use of this which was worn until the position of the teeth admitted of the use of a screw plate.

Other devices for expanding the dental arches are the Talbot Regulating Springs* (Fig. 13-14). These give us a power much more under control than a spiral spring, inasmuch as the pressure can be exerted (by a proper adjustment of the arms) both at the anterior as well as at the extremities of the spring.

This appliance is best used in conjunction with light vulcanite plates (Fig. 15), to which the spring may be attached by ligatures, or preferably vulcanized in, the same precaution being taken as in the case of the Coffin spring, to tin the part that is inserted in the vulcanite.

The vulcanite plates give a better bearing surface against the teeth and prevent displacement. Modifications of both

*Harris's Principles and Practice of Dentistry.

this and the Coffin Spring may be used for separating, as well as drawing teeth together.

We will now turn our attention to those cases where we have to push or draw into position individual teeth ; this operation may be effected either by pegs, springs, ligatures, elastic bands or screws.

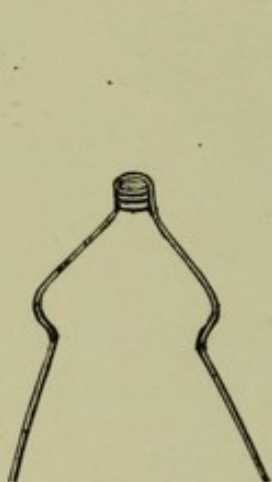


Fig. 13.

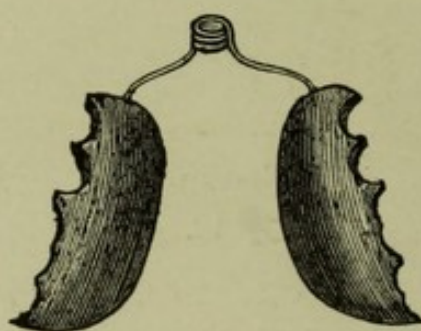


Fig. 15.

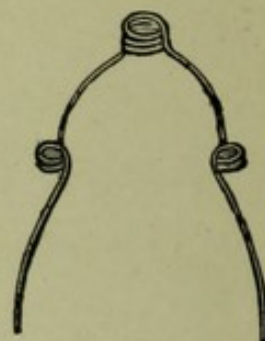


Fig. 14.

Fig. 16 is a simple case of pegging ; in this case the teeth were only partially erupted, and consequently very short; the plate has been cut away somewhat in the drawing to show the position of the pegs, which were lengthened as the teeth moved.

With ordinary drawn hickory pegs left projecting from the plate, one is able to make a case that the patient can remove and clean ; this being a hospital case rendered it even more necessary to place no obstacle in the way of so doing.

To use compressed wood for the same purpose, one ought to be able to ligature or clasp the case firmly to the teeth to prevent any movement taking place when the wood expands,

and care should be taken to select such teeth as will resist the force that is exerted when the wood gets moistened.

To illustrate the amount of force exerted by compressed wood, one has only to take, say, a piece of deal or willow about $\frac{3}{4}$ of an inch square. Now place the piece in a vice with

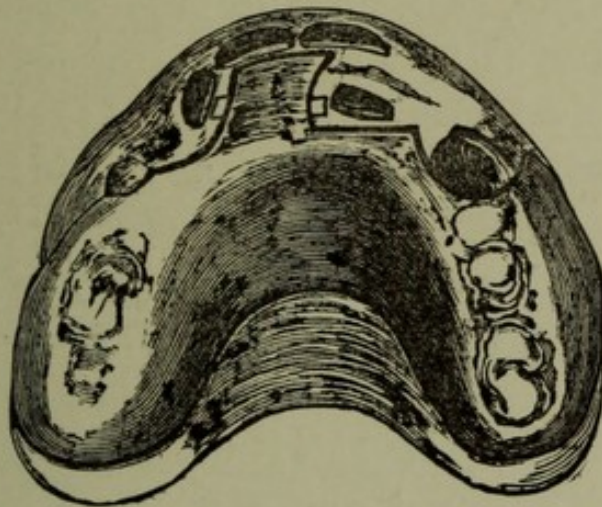


Fig 16.

the grain of the wood parallel with the jaws, and then compress until it is reduced to one half its original thickness. Next with a fret saw cut narrow blocks across the grain, and file these up until about the size of the hickory pegs sold at the depots for regulating purposes.

We will now take an ordinary vulcanite plate and drill a suitable chamber in it, to allow the compressed wood to be inserted, and to come flush with the surface of the vulcanite. If we place this plate in water we shall find in twenty four hours or even less, that the wood has expanded to its former length, and now projects one half from the plate. Instead of a hole drilled in the vulcanite one can have a dovetailed slot to contain the compressed wood. The slot should be widest

where it impinges on the tooth and should taper both upwards and backwards.

The rapid expansion of compressed wood to its original length proves most conclusively that the plate should be firmly secured to several strong teeth, to resist the force at any rate until the tooth begins to move.

With short teeth, pegs are often more useful than springs, as they are not so likely to get disarranged or misplaced. In all cases it is as well that the bite should be so raised that the tooth or teeth to be operated on may pass freely forward without coming into contact with the opposing teeth. In some cases, more especially in the upper jaw, where a front tooth has a decided slant inwards, a peg cannot be used with effect, as the projecting peg would not clear the point of the tooth and touch the back. This is a case in which compressed wood could be employed with advantage. Nor is a tooth with much of a slant outwards suitable for pegging, as there would be a tendency to shorten it instead of pressing it forwards.

In the first of these cases we may also adopt the following method.

Dry the plaster model and while warm paint it with chloro-rubber, then adapt a soft rubber plate to it to the size required, bringing it over the molars and second bicuspid. Next take a piece of hard gold or German silver wire about half the thickness of pin wire and bend it so as to conform to the arch of the front teeth.

The ends are now flattened, and after being warmed are pressed into the soft rubber and vulcanized. Fig. 17 represents such a plate. When finishing the plate up the rubber is cut away from the back of the misplaced tooth, and a small

India rubber band made from a piece of Maw's feeding bottle^e tube, is passed round the wire and threaded through itself, so forming a little loop which can be stretched over to make the necessary traction on the tooth. A convenient way for drawing the loop of rubber over the tooth is to pass a little piece of thread through it; the thread enables the patient to stretch the elastic ring, and to draw it over the misplaced tooth, and renders the operation simple.

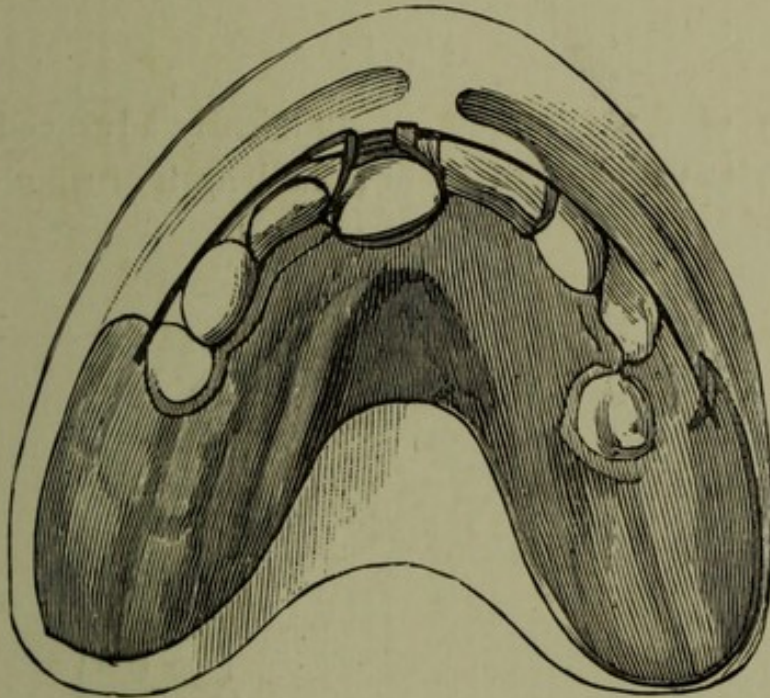


Fig. 17.

Another method by which upper centrals within the arch can be brought forward is by means of what is known as an inclined plane, (Fig. 18.) This is practically an elongation of the opposing front teeth made by bringing the vulcanite over the points of the lower centrals and slanting it inwards in such a manner that it will strike behind the upper tooth or

teeth, on closure of the mouth. As these loosen by the pressure, they slide forward and outwards along the plane, and in



Fig. 18.

the course of a short time get sufficiently advanced for the lower teeth to pass behind them ; the length of time required

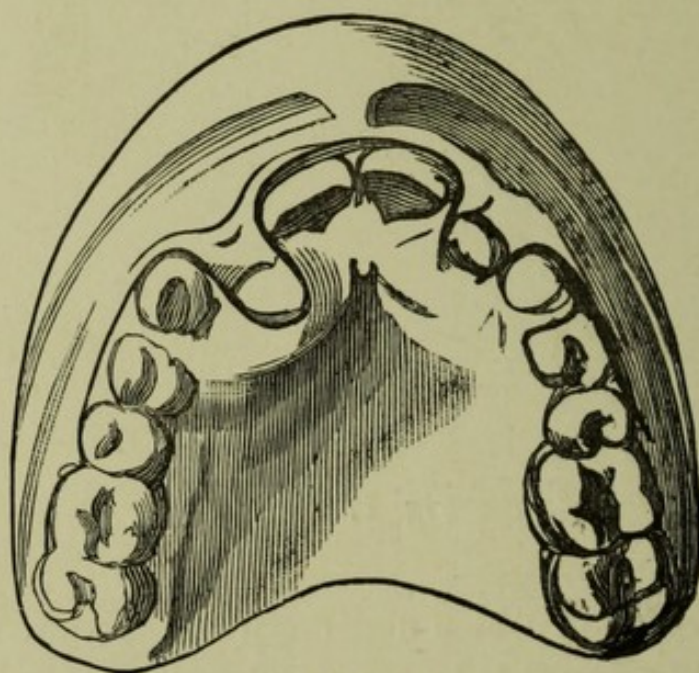


Fig. 19.

depends in a great measure on the amount of force exerted by the patient in closing the jaws.

When the teeth are sufficiently advanced that the lower

centrals past behind the uppers, the operation may then be regarded as complete.

The advancement forward of a tooth within the arch may also be affected by a strip of rubber dam, this should be

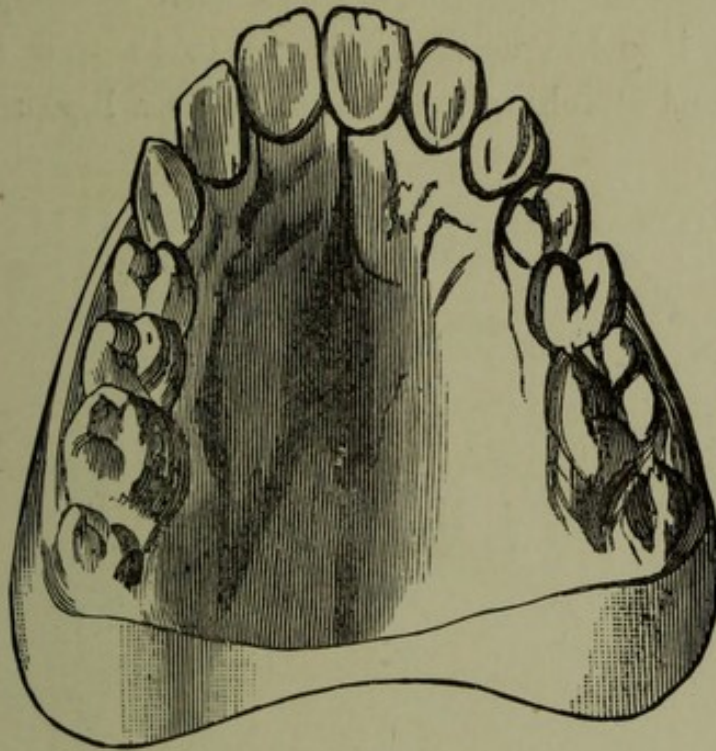


Fig. 20.

ligatured to the teeth on either side of the misplaced one, and then drawn in and looped over it, (Fig. 19).

In applying the rubber, a strip about three inches long and an eighth of an inch wide may be taken and securely ligatured to the teeth on one side first, then having passed the silk twice round a bicuspid on the other side of the mouth, the rubber is put on the stretch and held either by the patient or an assistant, while it is included in the ligature around the bicuspid.

As it is now under considerable tension, it has to be drawn into position and ligatured to the teeth adjoining the offender,

and it may then be drawn through the space and passed over the misplaced tooth, and secured so that it cannot slip off. The contractile power of a slip of rubber dam may be used either for elongating or shortening a tooth, by attaching it under tension to the neighbouring and then drawing it down to, (or above, if in the upper jaw) the tooth that has to be lengthened, and attaching it to the same by a ligature.

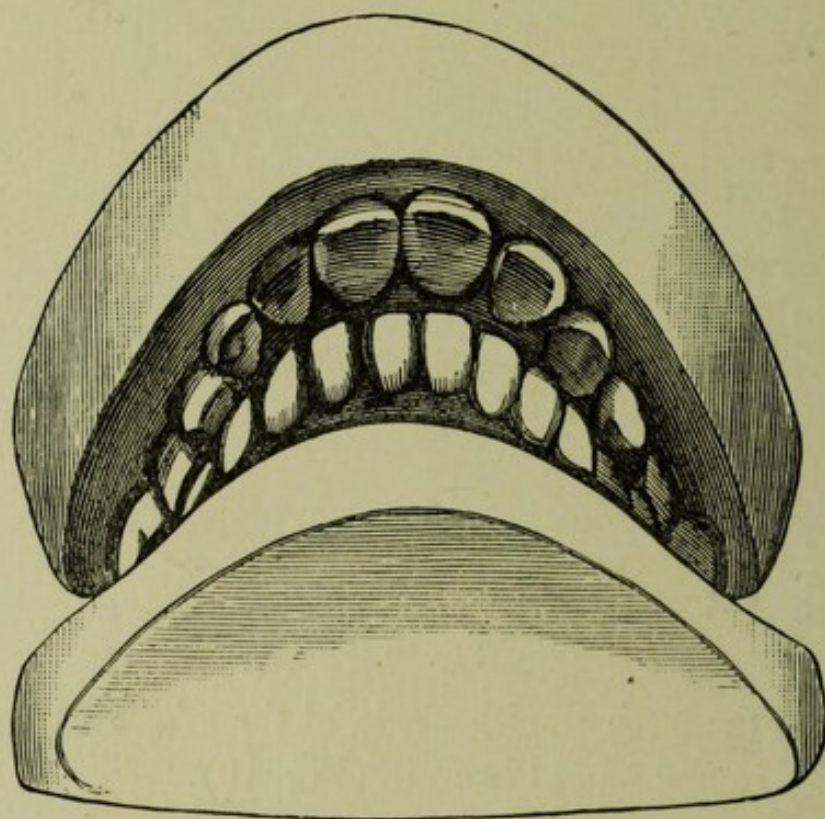


Fig. 21.

If a tooth has to be shortened, the rubber may be attached to the necks of the neighbouring teeth, and then stretched over the point of the tooth to be shortened, this will bring a considerable amount of pressure to bear, if the rubber strip has been made tense.

ANTERIOR PROTRUSION.

The following cases will serve to illustrate two of the most effective methods for remedying this condition of the teeth,

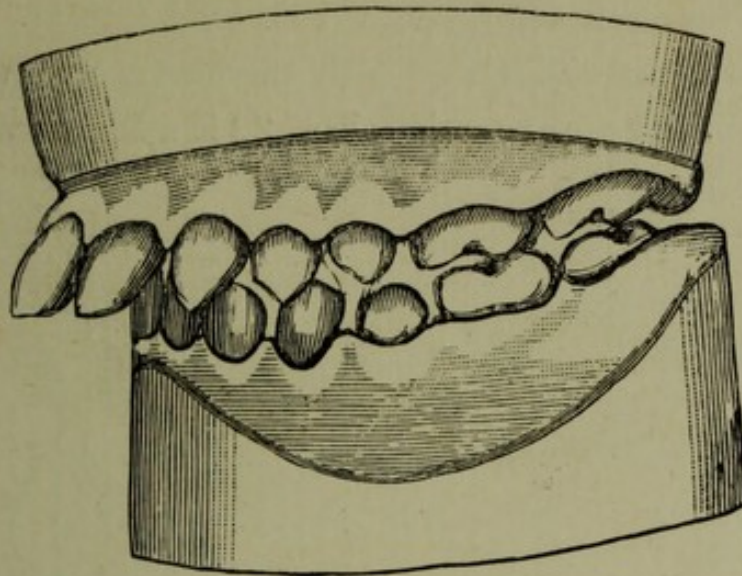


Fig. 22.

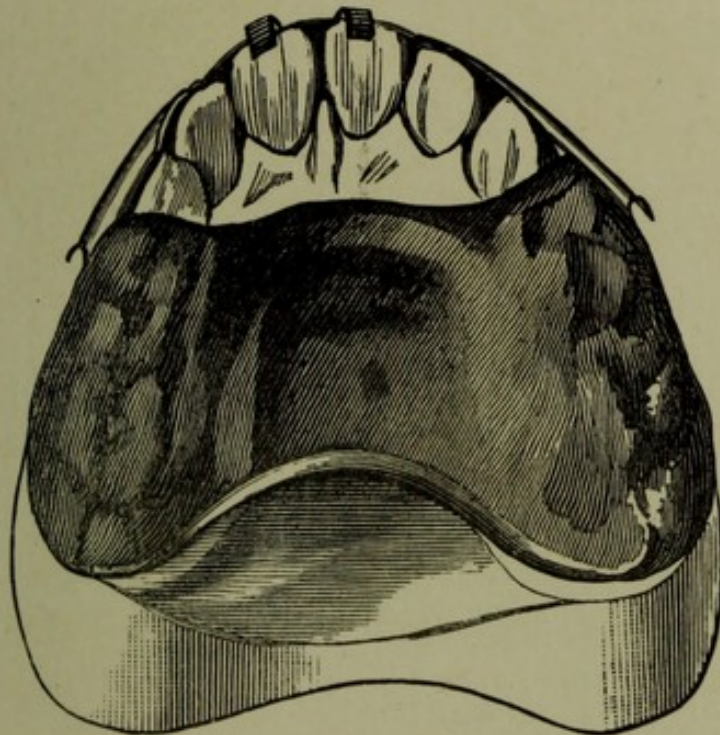


Fig. 23.

These two cases are somewhat interesting, as being those of two sisters; they were both treated together, so that a fair comparison could be obtained of the methods adopted,

Fig. 20 represents the mouth before operations. Fig. 21 is the same model articulated with the lower, and shows the projection of the upper teeth. Fig. 22 is a lateral view of the

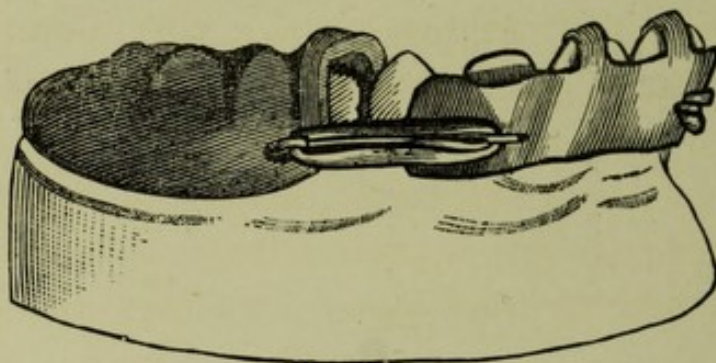


Fig . 24.

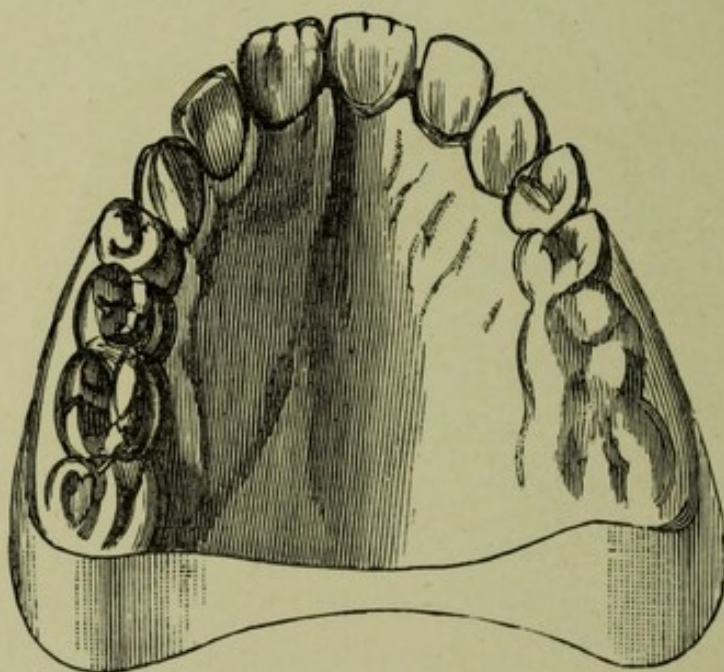


Fig. 25.

same. Fig. 23 shows the appliance made to correct the irregularity, Fig. 24 being an outside view of the same.

The appliance consisted of a vulcanite plate covering the back teeth on either side, and into the buccal borders little loops were vulcanized, these were to fasten the rubber bands to.

An impression was now taken of the faces of the six front teeth, and from the resulting model a zinc die and counter were obtained. A piece of dental alloy was struck up to the teeth, (see Fig. 24), and it will be noticed that two small extensions loop over the points of the two front teeth, the object of these pieces is to prevent the plate from slipping up and cutting into the front gum. Two loops were soldered to

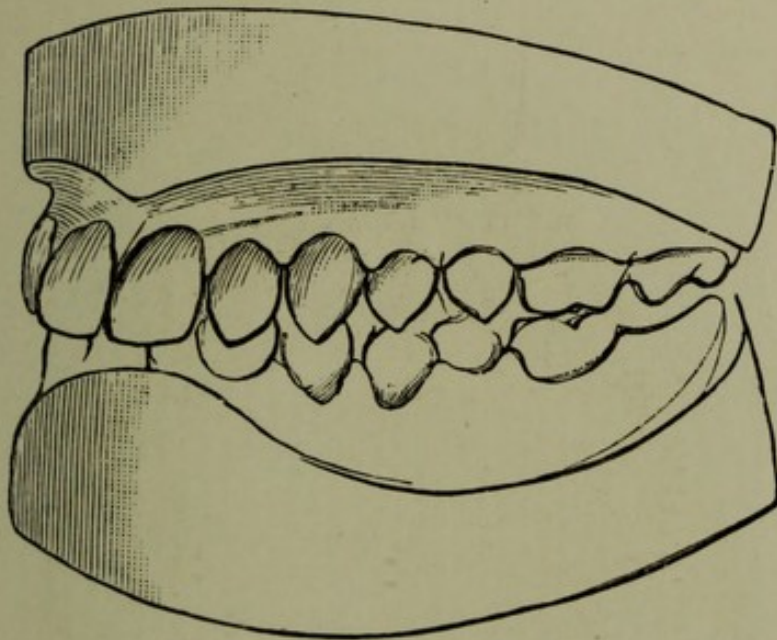


Fig. 26.

the upper and distal extremities of this plate, in a line corresponding with the loops on the vulcanite plate, so that the two pieces could be attached by small india rubber bands. In this

case the traction was increased by using smaller bands, as the teeth moved, and was sufficient to draw the teeth into the position shown in Fig. 25 and Fig. 26 in less than five weeks. They were not only brought fairly in to a normal arch, but somewhat shortened.

When treating a case on this principle, it is as well to show the patient how to apply the rubber bands and renew them when necessary, more especially if an interval of two or three weeks has to elapse before seeing her again.

Some idea of the condition of the mouth of the second sister may be gained by a glance at Figs. 27, 28, 29, and

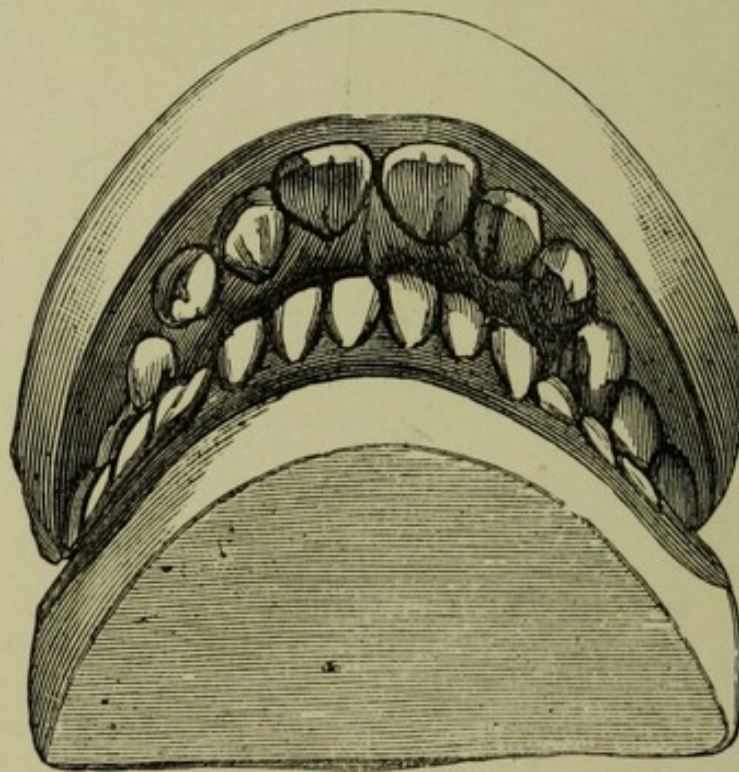


Fig. 27.

strange to say an equally good result was obtained, as in the first mentioned case, although the means employed were so different.

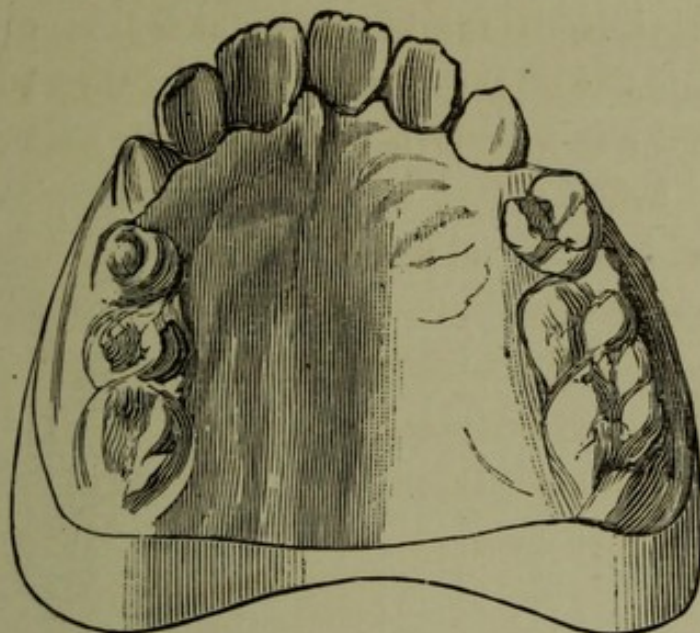


Fig. 28.

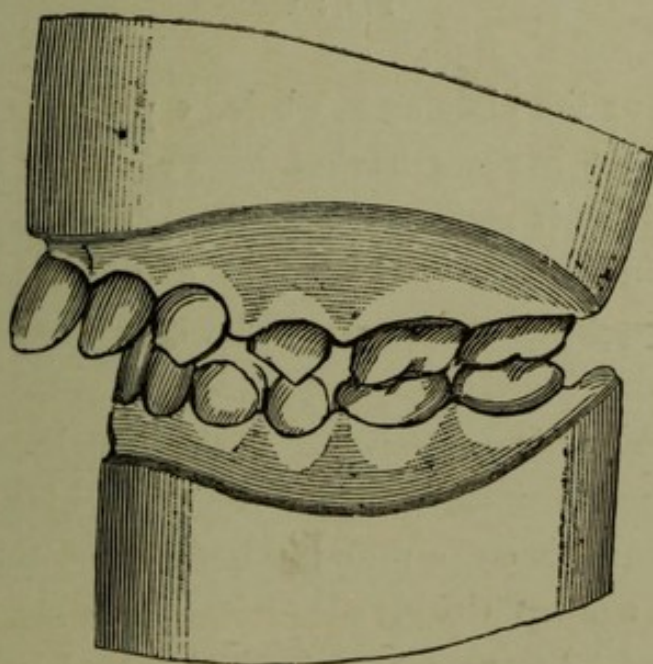


Fig. 29.

The appliance consisted of a vulcanite plate covering the palate and back teeth, and having extended from its anterior buccal aspects two strong springs made of hard 16 carat gold wire. In order to still further increase its elasticity it was reduced by being pulled through the draw-plate three or four holes without annealing afterwards.

Fig. 30 shows the position of the springs which were bent in from time to time to increase the pressure.

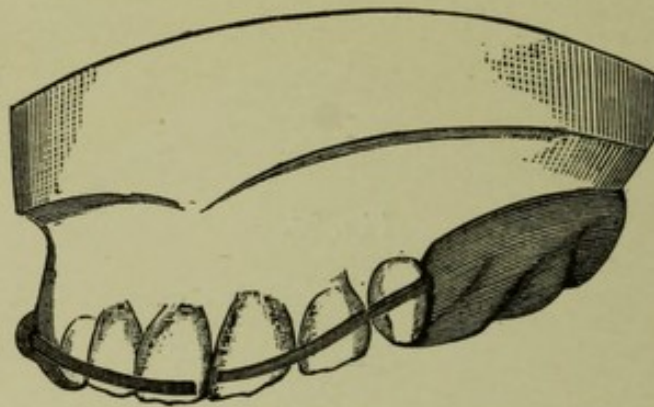


Fig. 30.

Fig. 31 shows the plate as a whole, a portion of the palate at the back of the incisors having been cut away so as not to interfere with their progress inwards. There was palpably no difference in the time occupied in getting the teeth into position, and each sister was supplied with a retention plate at the same time.

The retention plate consisted of a thick vulcanite denture covering the palate, into the extremities of which a gold wire was vulcanized; this came round the faces of the teeth and rested firmly against them.

Figs. 32 and 33 were drawn from the models on completion of the case.

In both these cases we were fortunately working under the

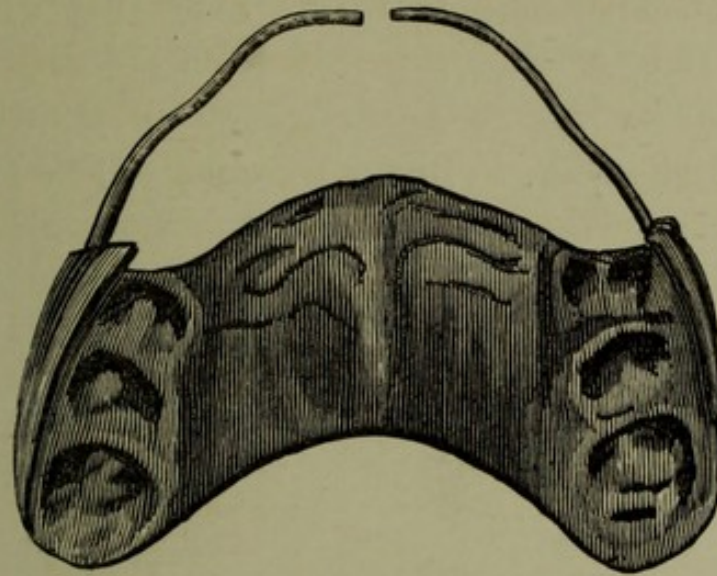


Fig. 31.

most favourable conditions, in as much as the anchorage on

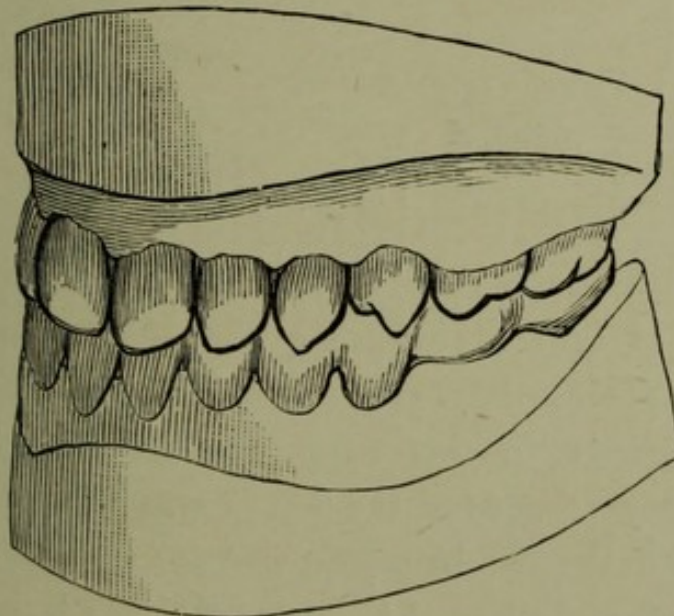


Fig. 32.

the teeth at the back of the mouth was ample for drawing the front ones backwards and inwards. In those mouths where

such is not the case, say where one has to extract the six year old molars and press the bicuspid one tooth backwards, a different method must be tried. Supposing one has only the second molar teeth, the first having been recently extracted, it is as well to begin operations by wedging the the second bicuspid. These will usually yield very readily if

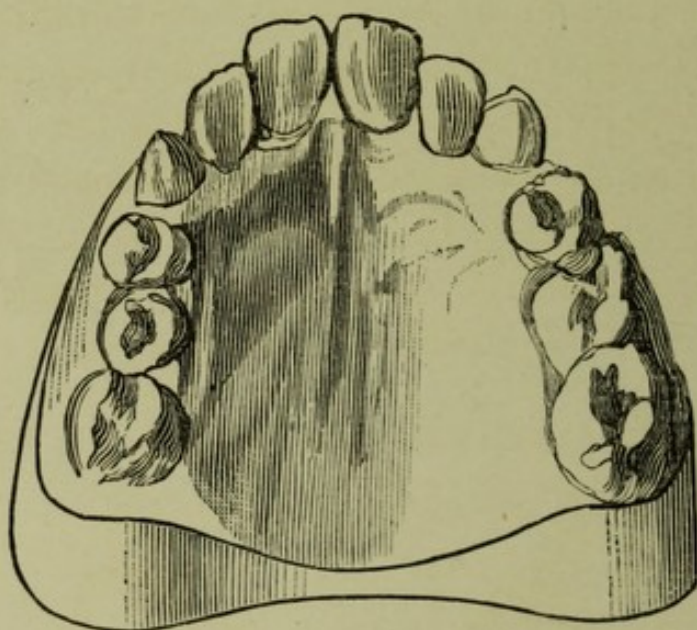


Fig. 33.

one uses the triangular rubber strips sold at the depots for this purpose, of course beginning with a strip of moderate thickness, and then increasing it. These teeth should be moved backwards in this manner until a fair space is obtained between them and the first bicuspid. Leaving the wedge between the two bicuspid we next turn our attention to the canines, and proceed to wedge the first bicuspid after the second until a good space exists between the canines and the first bicuspid. In about a fortnight it will usually be found that a space equivalent to one tooth has been obtained,

and that without interfering in any way with the second molars. Now to complete the operation and secure the space obtained, it will be found necessary to make a vulcanite plate to cover the palate and the second molars, which have now to do their share of the work by forming an anchorage to draw the first bicuspids (already loosened, and moving backwards) close up to the second. A very efficient way to do this, is to make a collar to fit the first bicuspid, leaving a little loop soldered to its lingual and labial aspects, to which strips of rubber dam can be fastened, and then ligatured to the vulcanite plate on either side of the second molar tooth. The traction exerted by these means will in a week or less bring the first bicuspid against the second, and secure the amount of space required for the bringing in of the six front teeth.

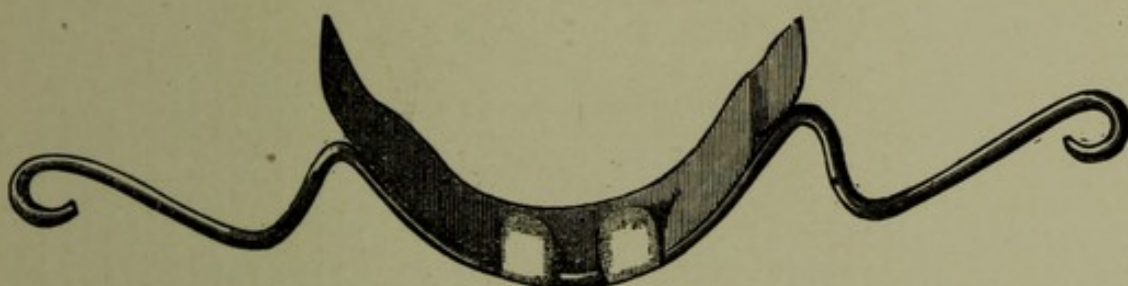


Fig. 34.

It is well when this has been effected to make a retaining plate, and let the mouth have a rest, say for three months, in order that the bicuspids may settle firmly in their sockets. After which one or other of the two methods previously described may be applied to their treatment, and that under favourable conditions.

Should it be necessary, however, to proceed with the operation immediately on securing the necessary space by

wedging the bicuspid, we may proceed to construct an appliance that will enable us to effect our object without in any way requiring anchorage at the back of the mouth. Such instrument will perhaps be best explained by consulting Figs. 34 and 35. The former is simply an appliance similar to Fig. 24, but with two extensions made in thick German

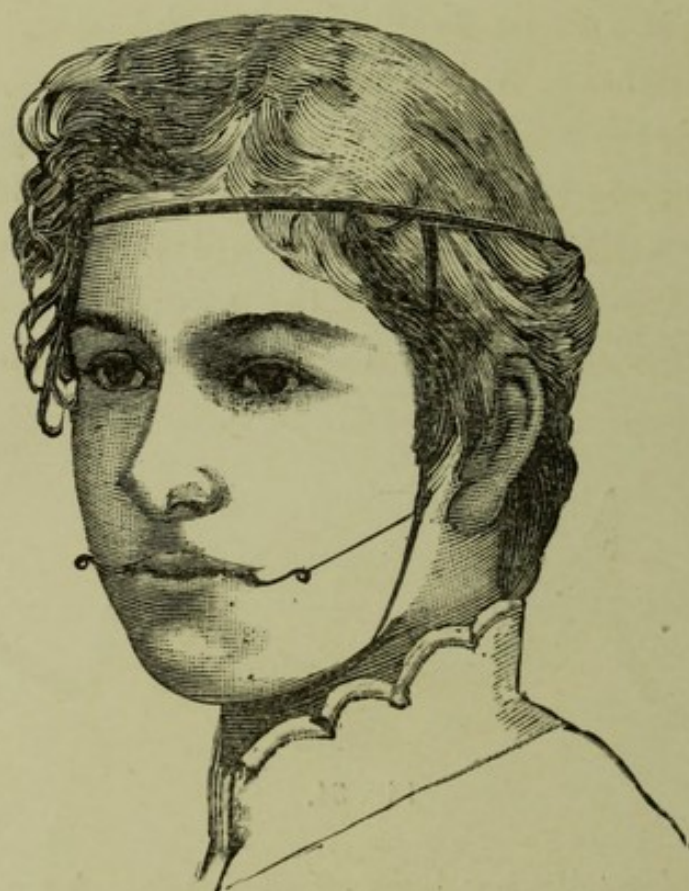


Fig 35.

silver; these extend in two loops and are shewn in position in Fig. 35. This illustration may be to some extent misleading, inasmuch as the artist has not given prominence to the teeth that would warrant a dentist's interference, and at the same time a ribbon should be attached to that coming down in front of the ear, so as to pass just under the ear and fasten at

the back of the neck. The band going round the forehead should be represented by a skull cap made to accurately fit and to which the ribbons, to make firm, are secured. A fixed point in front of the ear can thus be obtained and elastic bands can be secured to this point and fixed to the loops at the angles of the mouth. As an appliance such as this is rather conspicuous, it may be worn always at night and other times when convenient, and it is a very effective way for employing force where there is insufficient anchorage in the shape of teeth at the back of the mouth. This question of anchorage is one that should be taken into serious account and recognised by the student, as the forward advance of the second molars into the spaces occupied by the first, without gaining the necessary room for the bicuspid, makes a condition of affairs that is somewhat difficult to remedy.

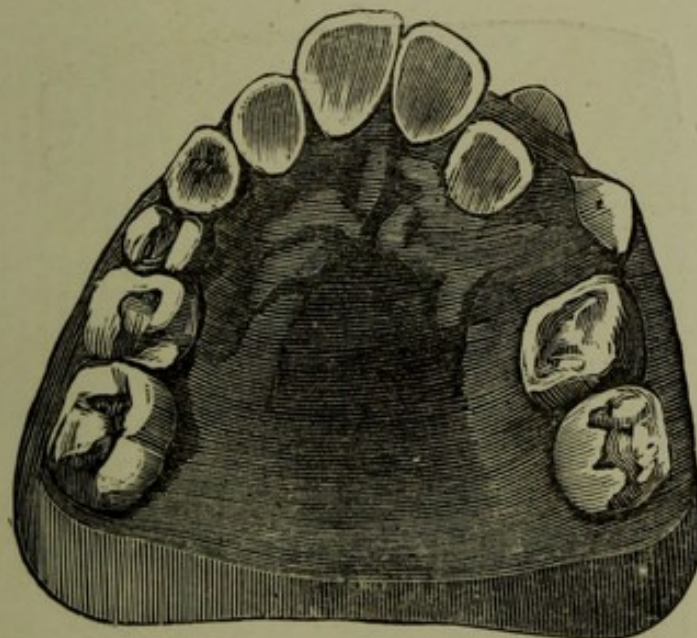


Fig. 36.

Fig. 36 is an illustration of a not uncommon form of irregularity. In this case, owing to the crowded state of the

mouth, and the broken down condition of the lower seven year old molars, symmetrical extraction was decided on, but before losing the teeth it was seen that they could be made of considerable use, not only as attachments or supports to the plate, but also as anchorages, more especially the one on the left side, from which to apply force to draw back the bicuspid and canine tooth.

On looking at the diagram it will be seen that the two second temporary molars are in position; these were removed. By their removal we gained a space equal to a third of their size on each side, or in other words the second bicuspid which erupt beneath them, are about that amount smaller, this gives us some room which, in normal mouths, is sufficient for our wants, but in this case it was not.

An impression of the mouth was then taken and the model

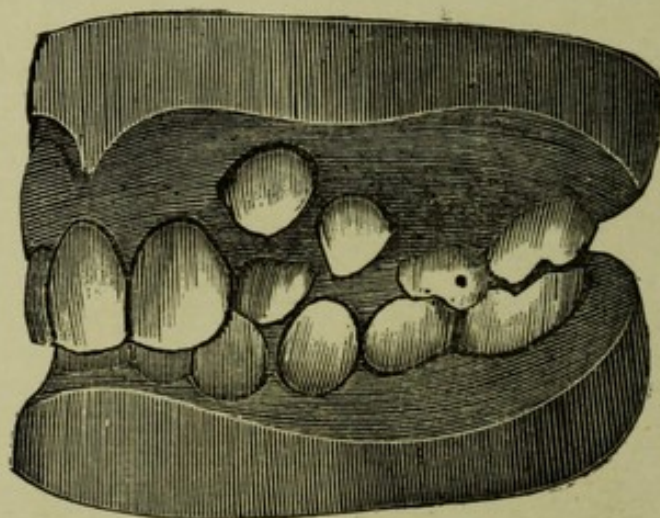


Fig. 37.

cast. Fig. 37 is a side view of the case, and it shows the left lateral within the arch, and locked by the lower canine. The upper canine is in front of, and slightly anterior to the lateral,

and the first bicuspid practically occupies the place of the canine.

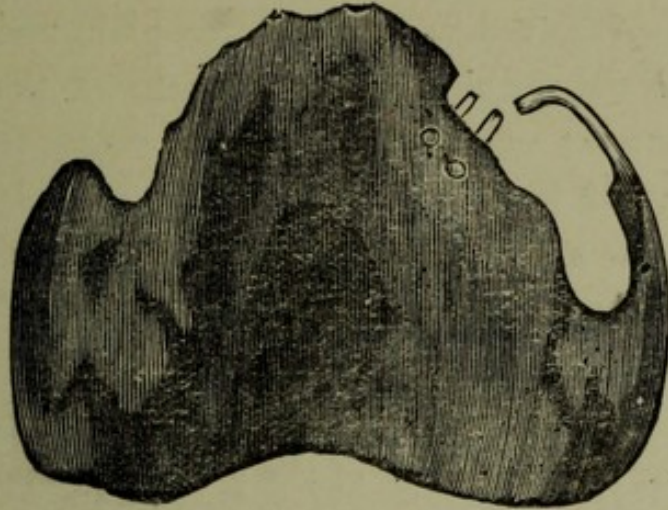


Fig. 38.

A vulcanite plate was first made to raise the bite, and a piece of spring gold was vulcanised in, and bent so as to bring pressure and some slight amount of traction on the canine. A peg was next inserted to act on the lateral, and so press it into its proper place.



Fig. 39.

The action of these two forces was sufficient in a few days to push the lateral outside the lower tooth, and to bring the canine against the bicuspid.

It was now resolved to make another plate, and to use pegs to accomplish the remainder of the work, as their action on the small portion of visible tooth was more certain than a spring. Fig. 39 is an illustration of the second plate made. A small peg was first of all inserted in it, to act on the bicuspid and press it backwards ; this it did most effectually. Next this portion of the plate was filed away and a peg inserted to act on the canine ; this peg is shewn in the figure. The front, or labial portion of the plate was made thin and light and its elasticity acting on the peg was sufficient in a very short time to bring the tooth into the position as seen in Fig. 40.

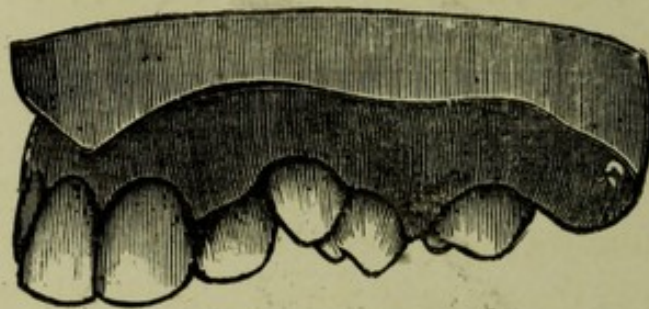


Fig. 40.

Having thus made all the use we could of the first permanent molars, they were then extracted, and Nature was left to do the rest, the plate being used as a retention plate. The action of the peg against the canine had one good effect that was not foreseen. Before commencing the work the two central teeth had a decided bias, or leaning over to the

left side ; after the operation I was pleased to find that they were perfectly straight. This, of course, was due to the pressure excited in forcing back the canine, and was an advantage one had not anticipated.

The following case (Fig. 41), is that of a young lady of

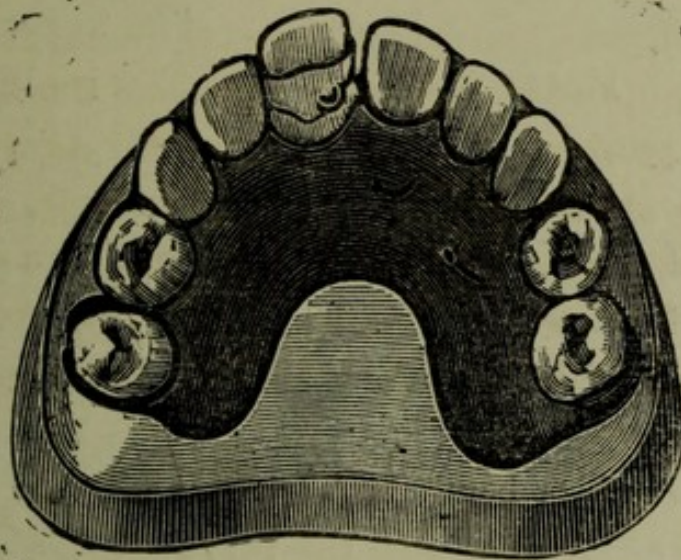


Fig. 41.

twenty-four, whose right central was being pressed outwards and away from its neighbour. As she had a great objection to anything in the shape of springs or bands being visible, the following treatment was adopted.

A dental alloy plate was made with clasps to encircle the bicuspid on each side. Then a fine silver band was adapted to fit the front tooth, and was cut away to about one-sixteenth of an inch where it came round the front of the tooth, thus presenting very little for observation. On the palatine aspect where the band was left broader, it was nicked with a sharp pair of shears and lapped to fit the back of the tooth, this was

quite sufficient when the band was soldered up again, to prevent any slipping on the tooth when traction was put upon it.

Fig. 42 shows the band on the palatine, and Fig. 43 the same on the labial aspect.



Fig. 42



Fig. 43.

In Fig. 42 will be seen the little loop soldered to the cervical margin of the band. In the palate of the case two holes were drilled, into which two pieces of wire were soldered; these were bent so that a band could be looped over the one more distant, whilst the other kept the band on to the surface of the plate.

An india rubber band cut from a small rubber tube was now ligatured to the loop on the band, and the other end of the band was passed over the last wire hook on the plate and then pressed under the other. The plate was then inserted in the mouth, and the metal band was drawn forward and passed over the offending tooth. As the silver was left with a dull surface, it was scarcely noticeable, and in about eight or ten days the tooth was drawn into position. The band encircling the tooth was then soldered to the plate, which then did duty as a retention plate.

The band also acted as an inclined plane and pressed the opposing tooth out of dangerous contact.

If India rubber bands are employed in cases such as the one illustrated and in a similar manner, there can be no possible objection, it is when they are left unguarded that

the danger comes in, and too much care cannot be exercised by the teacher in bringing these dangers constantly before the notice of the student.

We have a power in the elasticity of a piece or ring of rubber that is perfectly under control, and of great value, but to render it safe it must be ligatured to the plate or to the teeth.

Springs made of pianoforte wire are now extensively used for moving teeth. They may be of the simple form as shown in Fig. 44, which are bent so as to spring against the mis-

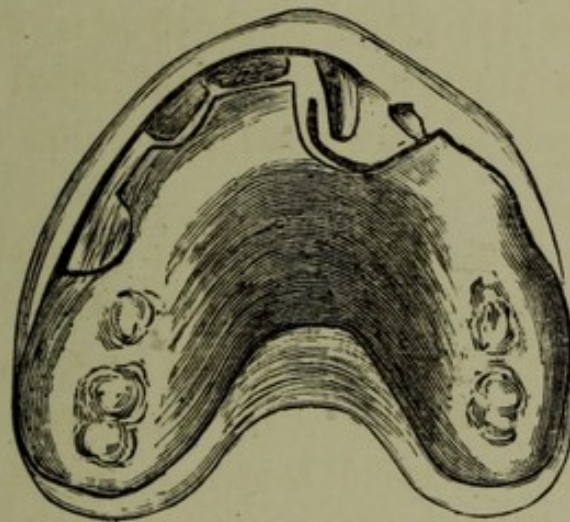


Fig. 44.

placed tooth, or they may have a coil so as to increase their springiness.

These springs are practically modifications of the Talbot spring (Fig. 13), one end being cut short at the coil and fixed in the vulcanite plate, while the free end is bent so that it will act against the offending tooth. A little screw post should keep the coil in position and prevent displacement. In ordinary cases the free end of the spring may simply press

against the neck of the tooth, but where one has a strong canine to press outwards, the spring may be so bent that it presses slightly under the gum, and so gets a greater leverage on the tooth.

Besides the manifold cases of Dental Irregularities that yield to one form or other of Mechanical treatment, we sometimes find ourselves face to face with such an abnormal condition of the Dental Arches and teeth that even the most ambi-



Fig. 45.

ous among our number would shrink from undertaking on the ordinary lines, the chances of even a partial success being too remote to justify a long course of treatment by one or other of the methods usually adopted. It is to two or three of these cases, that attention is now directed.

The first is that of a girl about nineteen, who was brought under my notice by my friend Dr. Percy Jakins, who had been treating her for some throat mischief, deafness, indigestion and various ills arising in a measure it might be assumed

from the terrible condition of her mouth. On looking at Fig. 45 it will be seen that the patient's mouth is partly open; she could not close it any more. The next condition is apparent by looking at Fig. 46, this shows the state of affairs in the mouth, all the teeth being practically functionless, and so far as one was able to judge could not be rendered otherwise by conservative treatment.

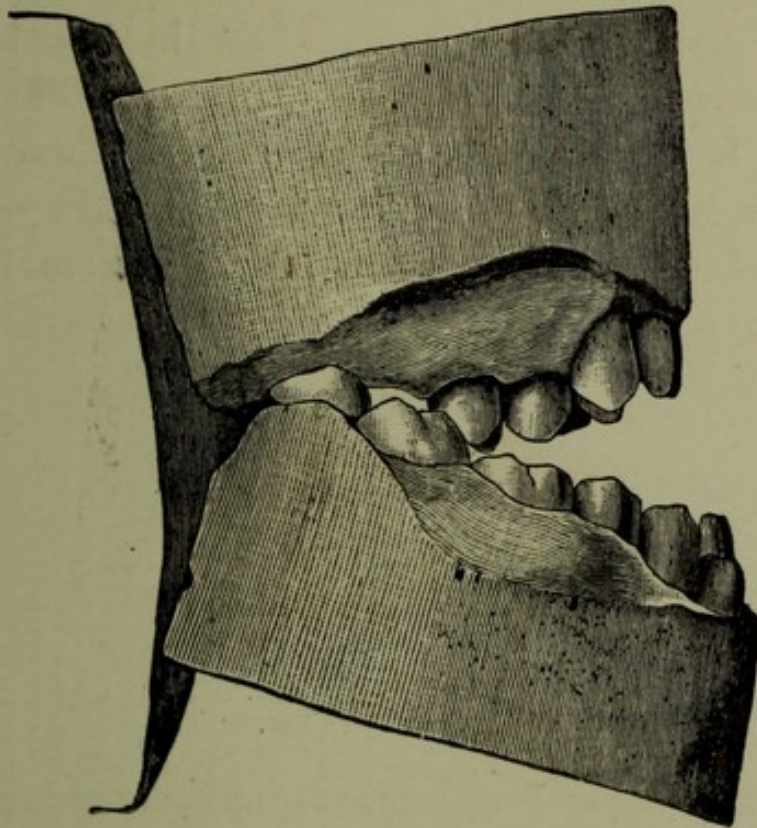


Fig. 46.

When dealing with these conditions of the teeth, one has to consider first, if when the teeth are extracted the patient would be able to wear artificial substitutes with comfort, and secondly, one has also when preparing the mouth to leave no loophole for failure, by being tempted to leave in the mouth teeth that might interfere with a successful result. It is only

natural that one should wish to preserve as many of the patient's teeth as possible, but at the same time if the denture that one has to construct is not a success, then the last condition of that patient is decidedly worse than the first.

In order to see if there was the least chance of utilising any of the teeth, the molars on each side were removed under gas, this had the effect of giving a little more play to the jaws, but the amount of approximation obtained was not sufficient to justify one in abstaining from the removal of the whole of her teeth, which operation was performed under gas and ether. In less than three weeks the patient was able to wear a temporary set, and masticate her food fairly well, and also to close her lips together comfortably as seen in Fig. 47.



Fig. 47.

At the end of six months permanent cases were made and she could then use her teeth well in every respect, and her health had considerably improved.

The next case (Fig. 48), is that of a girl about the same age as the last, it is a well marked case of underhung bite. I

am indebted to my colleague, Mr. Charles Glassington, for bringing this patient to my notice ; he consulted with me as to the probable success of a denture. It was thought at first



Fig. 48.

that a case could be made to cap over her upper teeth, and made to project sufficiently to bring the lower teeth into

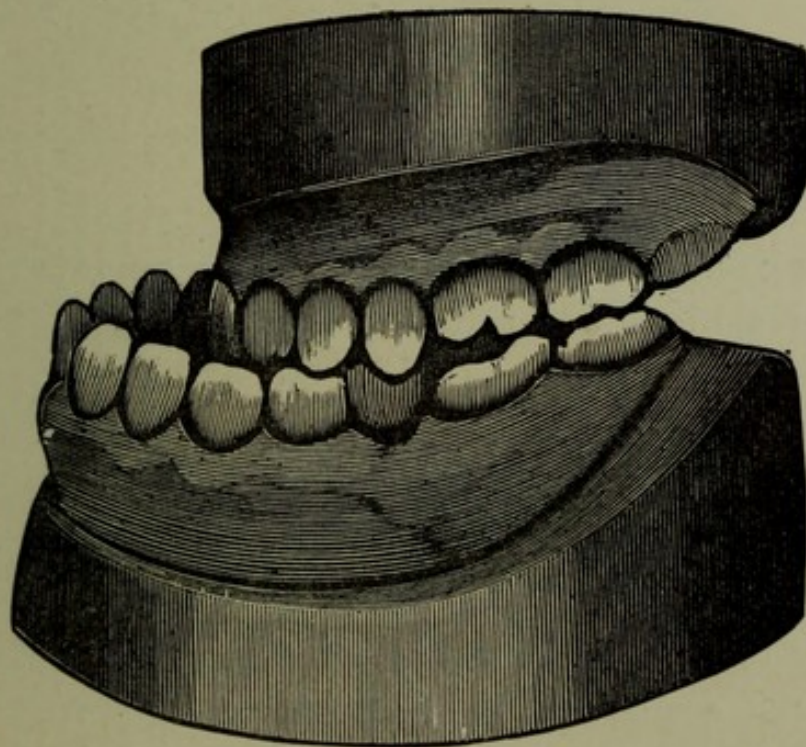


Fig. 49.

articulation, but the evil attending that mode of procedure would have been the rapid decay of the covered up teeth and consequent worry and discomfort to the patient.

On examining the patient's mouth (Fig. 49), and building



Fig. 50.

up a wax case to the upper, to give one an idea how the patient would look under the altered conditions, the result was very gratifying, and on raising the bite fully a quarter of an inch the appearance of the patient was improved still more.

It now became a question as to the retention of any of her upper teeth, and feeling convinced that an edentulous upper presented the best chances of success, in which opinion Mr. Glassington concurred, he removed her upper teeth and made her a complete upper case. Figs. 48 and Fig. 50 are

before and after the operation. One cannot but feel gratified that the results gained not only considerably improved the

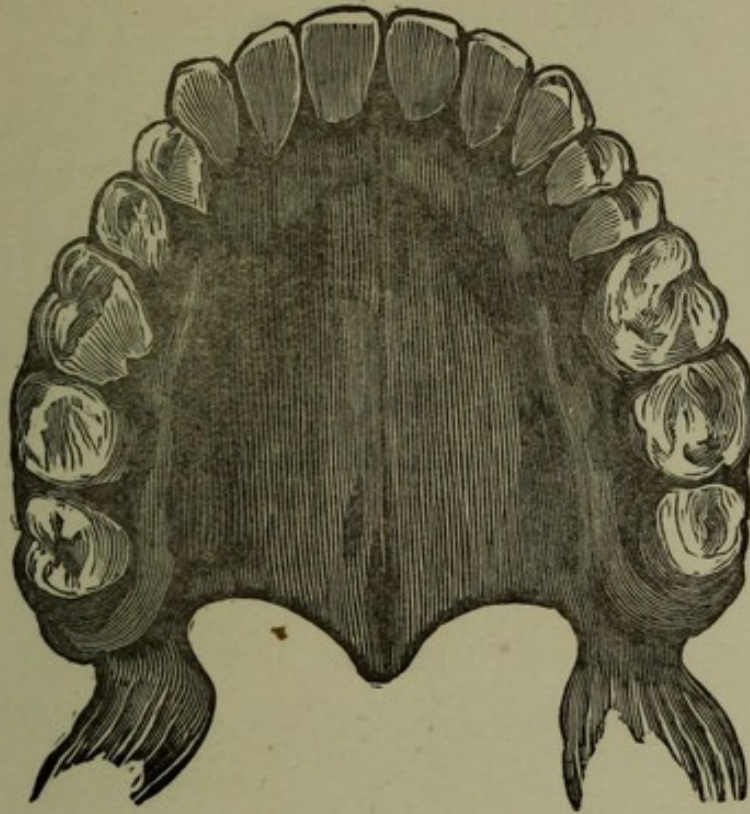


Fig. 51.

looks of the patient, but at the same time put her in possession of a useful dental armature instead of her own functionless ones.

The only other case (open bite) in which I had to resort to such extreme measures was one in private practice. In this latter I was able to retain the patient's lower front teeth, and make up the depth of the upper case in continuous gum. The appearance of the patient in this case was also much improved, as well as her general health.

As a contrast to these abnormalities, and also to serve as a

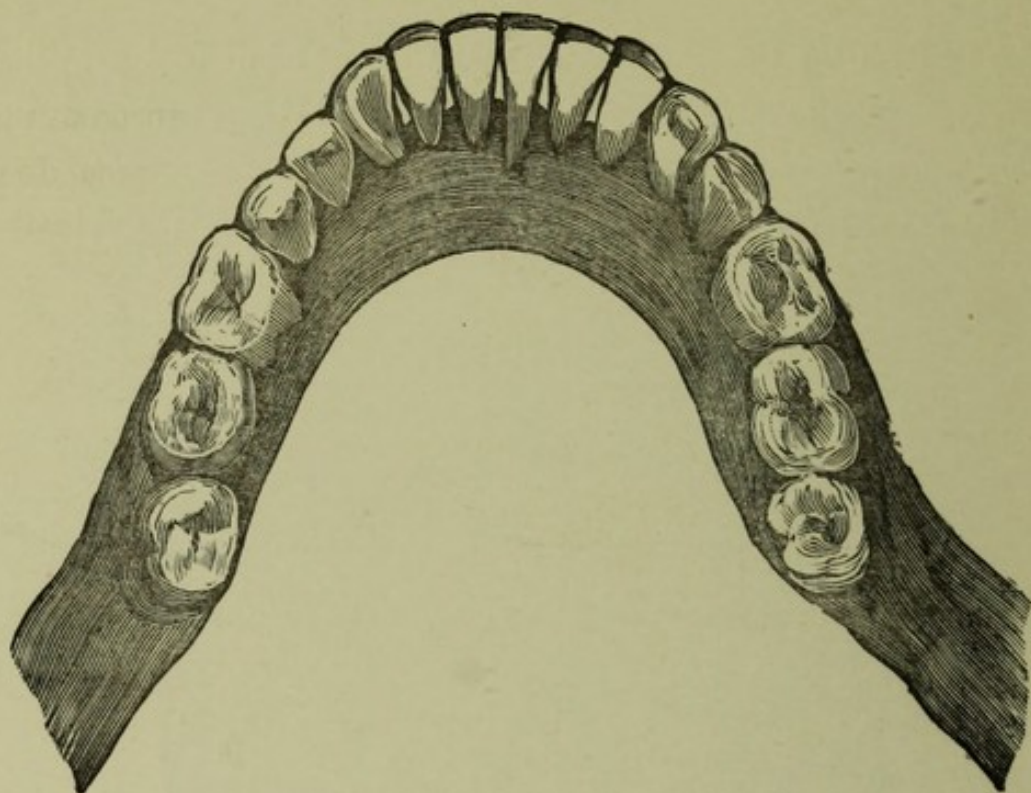


Fig. 52.

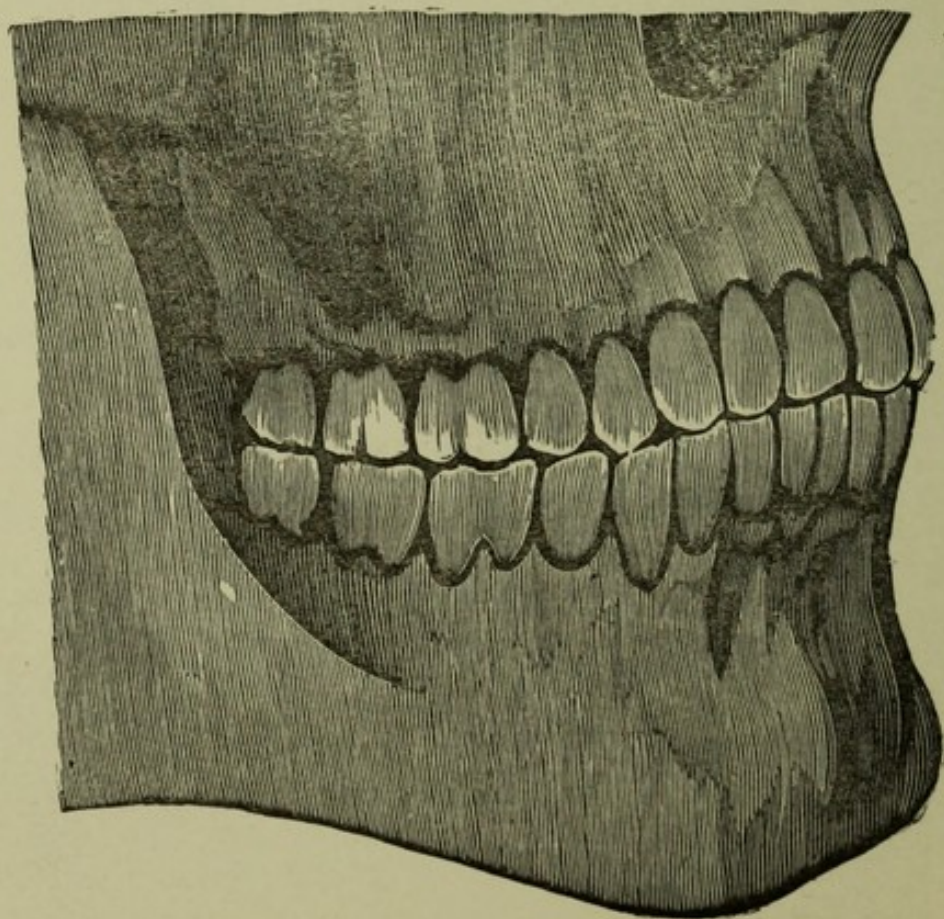


Fig. 53.

guide to those who in setting up teeth aim at reproducing a perfect arch, I have here introduced specimens of typical dental arches. Figs. 51 and 52 show the arrangement of the teeth in an early Saxon skull. The teeth are somewhat worn, but not the slightest trace of decay is visible in the whole thirty-two teeth. The width across the palate of the upper and between the wisdom teeth in the mandible gives ample room for the teeth without crowding. Fig. 53 shows the articulation of the same jaws, and gives one a good idea as to what a perfect dental armature means. A similar skull to this, dug up at the same spot, is now, I believe, in the Fitzwilliam Museum at Cambridge, with a broken spear-head imbedded in it.











