No. 664,412. Patented Dec. 25, 1900.

M. A. KNAPP.

TEETH REGULATING APPLIANCE.

(Application filed Oct. 17, 1900.)

(No Model.)

FIG. 5.



FIG. 1.

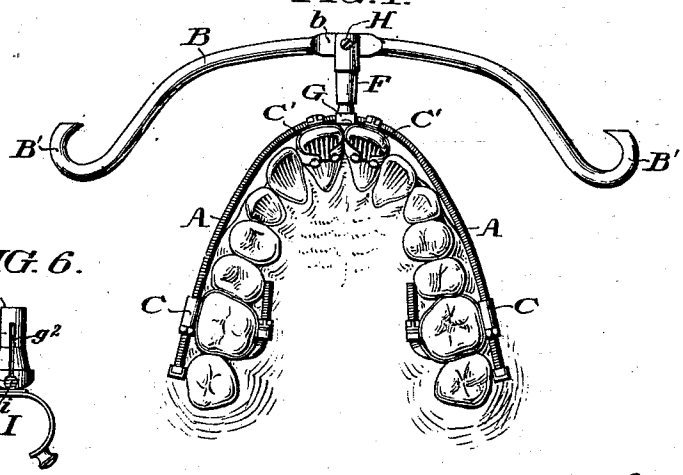


FIG. 6.

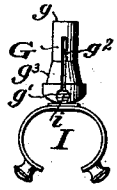


FIG. 4.



FIG. 2.

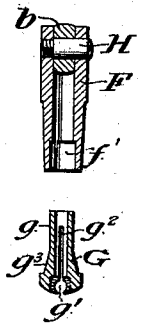
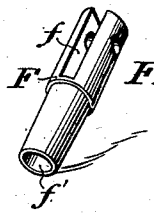


FIG. 3.



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TEETH-REGULATING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 664,412, dated December 25, 1900.

Application filed October 17, 1900. Serial No. 33,326. (No model.)

To all whom it may concern:

Be it known that I, MILAND A. KNAPP, a citizen of the United States, residing in Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Teeth-Regulating Appliances; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to teeth-regulating appliances, and is particularly adapted to that class of such appliances especially designed for the correction of irregularities known as "excessive protrusion" of the upper incisors.

The invention consists of certain improvements, which will be hereinafter fully described with the aid of the accompanying drawings and then pointed out in the claims, the object of these improvements being to render appliances of the above-mentioned class more efficient.

In said drawings, Figure 1 represents a superior jaw or denture with protruding incisors and having applied thereto a regulating appliance made in accordance with my invention. Fig. 2 is a central longitudinal sectional view, on an enlarged scale, of the standard and chuck of said appliance, the chuck being shown as detached from the standard. Fig. 3 is a perspective view of said standard, and Fig. 4 a perspective view of said chuck. Fig. 5 is a view illustrating the application of the appliance. Fig. 6 is a plan view of said chuck shown as engaging the stud of a tooth-band.

A regulating appliance of the class to which my invention is applicable may be said to consist of the following parts or members: an arch-bar A, adapted to be placed inside the mouth of a patient and connected to or caused to bear upon certain teeth therein, some of which are to be retracted, an independent or separate protrusion-bow B, (or "traction-bar," as it is sometimes designaed,) adapted to be located outside the mouth and having pivotal or rocking connection or engagement with said arch-bar, and means for applying tension to said protrusion-bow whereby said tension may be transmitted to said arch-bar for the purpose of correcting the irregularities of the teeth upon which said arch-bar bears.

The arch-bar A, as its name implies, is arch-shaped to approximately correspond to the dental arch to which it is to be applied and is preferably screw-threaded from end to end to provide for the attachment of bands, loops, clamps, &c., such as C C', by means of which it may be secured to the natural teeth, as will be understood by those familiar with dentistry. The protrusion-bow B should be suitably curved, as shown, and its opposite ends provided with loops or hooks B' B' for the attachment of the means for producing tension. This means may consist of a head-gear or cap D and elastic bands E, connected to the opposite ends of the bow.

The connection between the arch-bar and the protrusion-bow consists of a standard F, having pivotal connection at one end with the protrusion-bow midway the length thereof and provided at its opposite end with a chuck or clutch G for engaging the arch-bar.

The preferred manner of constructing the standard F and chuck G is as follows: The standard F is slotted at one end f, where it straddles the central flattened portion b of the protrusion-bow, and a screw-bolt H, passing through the slotted end f of the standard and the flattened portion b of the bow, provides a pivotal connection which enables the bow to rock relatively to the standard in the plane of curvature of said bow. The opposite or free end of the standard is socketed at f' for the reception of the shank g of the chuck G. The head of the chuck is transversely bored and threaded at g' and is also split at g^2 to render it springy. Immediately in rear of its head the chuck is preferably coned, as at g^3, so that when forced into the socket of the standard it will more firmly grip the arch-bar, which passes through its transverse bore. By this construction not only is the protrusion-bow capable of being rocked relatively to the standard in the line of curvature of the bow, but the standard and bow may swivel about the chuck and the chuck, standard, and bow rock about the arch-bar in a line substantially at right angles to the line of movement of the bow relatively to the standard when the parts are in normal operative position or when said protrusion-bow and said arch-bar occupy positions substantially in the same plane, as

shown. The purpose of this construction will be hereinafter made plain.

In using my improved appliance the arch-bar A is secured upon the teeth in a manner similar to that shown in Fig. 1. The split chuck G is then sprung onto the arch-bar at any anterior point, usually at its center, as shown, after which the shank of the chuck is seated in the socket of the standard F. Any suitable head-gear or cap D, such as shown in Fig. 5, may be connected by elastic bands E with the hooked ends B′ B′ of the protrusion-bow to produce the desired retractive pressure on the arch-bar A. To remove the bow or change its relations, it is only necessary to detach the ends of the bow from the head-gear bands and slip the standard from the chuck. The chuck may be readily sprung off the arch-bar by a slight lateral pulling movement.

In regulating appliances of the character herein referred to the protrusion-bow being on the outside of the patient's mouth is subjected to accidental shocks and movements which are occasioned most frequently by the ends of the bow being pressed upon by a pillow when the patient is asleep. It is obviously of great importance for the comfort of the patient that the transmission of such shocks and movements to the arch-bar and the teeth to which it may be connected should be reduced to a minimum. This object is attained to a large degree by the hereinbefore-described construction, which enables the chuck and standard to rock about the arch-bar at an angle to the plane of said bar, the standard and protrusion-bow to turn or swivel about the chuck, and the protrusion-bow to rock about the standard at an angle to the rocking movement of the standard and chuck about the arch-bar. At the same time this construction provides for unswerving pressure of the standard upon the arch-bar, and as the standard is prevented from rocking on the arch-bar in a line with the plane thereof the pressure of said standard is necessarily in a direction substantially in the plane of the longitudinal axis of the dental arch and not obliquely to said axis. The advantage of this will be apparent, the line of retractive pressure being in the direction most desired—*i. e.*, directly toward the rear of the arch instead of toward either side of its center. The split chuck is adapted to grip the arch-bar with sufficient force of itself to prevent its accidental detachment from said arch-bar even when it is relieved from pressure of the protrusion-bow. Consequently when the retractive pressure applied to the protrusion-bow is somewhat momentarily relaxed the sliding connection between the standard and chuck permits the bow and standard to slightly move away from the chuck without detaching the same from the arch-bar or separating the standard from the chuck.

It will thus be seen that I have produced an appliance for regulating cases of excessive protrusion of incisor teeth which, while capable of applying the proper retractive pressure to the teeth in a superior manner as compared with similar appliances now in use, can be employed with the least amount of discomfort to the patient.

While regulating appliances made in accordance with my invention are particularly useful in the treatment of excessive protrusion of the superior incisors, they are also useful in correcting irregularties of the teeth of the lower jaw and may likewise be employed in other classes of orthodontia. For instance, the protrusion-bow may be connected to a single tooth instead of to the arch-bar. This may be accomplished as shown in Fig. 6, in which the chuck G is represented as gripping a threaded stud *i* on a tooth-band I, adapted to be secured to a tooth similarly to the bands C′. The chuck is provided with a threaded longitudinal socket g^4 for engaging said stud *i*.

The single embodiment of my invention herein shown and described satisfactorily accomplishes the purposes sought; but it must be understood that while I do not broadly claim a pivotal or rocking connection between the protrusion-bow and arch-bar my invention is broader than, and is not restricted to, the precise details contained in said embodiment. Not only is the general design of the various parts capable of modification, but the form of chuck and standard may likewise be altered without departing from the principle of my invention.

I claim as my invention—

1. A curved protrusion-bow for teeth-regulating appliances having a centrally-located standard pivoted thereto in such manner that the bow is capable of being rocked in the line of its curvature relatively to said standard, substantially as and for the purpose set forth.

2. A protrusion-bow for teeth-regulating appliances having a centrally-located standard pivoted thereto, said standard being provided with a chuck adapted to grip the arch-bar member of said appliance, substantially as and for the purpose set forth.

3. A protrusion-bow for teeth-regulating appliances having a standard projecting from its center, said standard being provided with a split chuck having detachable connection therewith, substantially as and for the purpose set forth.

4. A curved protrusion-bow for teeth-regulating appliances having a centrally-located standard pivoted thereto, said standard being provided with a chuck having turning connection therewith, substantially as and for the purpose set forth.

5. A protrusion-bow for teeth-regulating appliances having a standard projecting from its center, said standard being provided with a split chuck, the bore of which passes transversely through it, substantially as and for the purpose set forth.

6. In teeth-regulating appliances, the com-

bination of an arch-bar adapted to be secured to the teeth inside the mouth, a curved protrusion-bow to be located outside the mouth and provided with a central standard pivoted thereto in such manner that said bow may be rocked in the line of its curvature relatively to said standard, and a chuck having separable and swiveling connection with said standard and provided with a transverse bore for gripping said arch-bar so that said chuck may rock about said arch-bar but cannot be rocked in the line of curvature thereof, substantially as set forth.

7. In teeth-regulating appliances, the combination of a protrusion-bow, an arch-bar, and a sliding connection between said protrusion-bow and said arch-bar, whereby said protrusion-bow may be moved toward and away from said arch-bar to a certain extent without separating therefrom, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

MILAND A. KNAPP.

Witnesses:
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CHAS. E. F. TODT.