H. E. KELSEY.

ORTHODONTIC APPLIANCE.

APPLICATION FILED JAN. 15, 1914.

**1,166,766.** Patented Jan. 4, 1916.

FIG. 1.

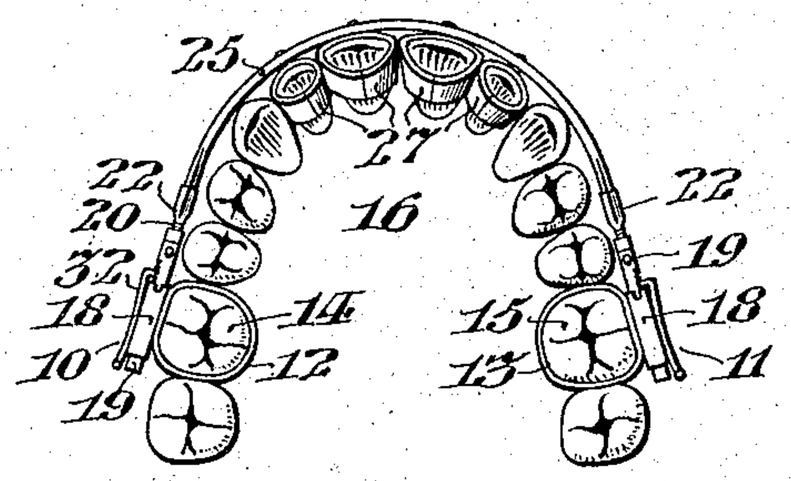



FIG. 2.

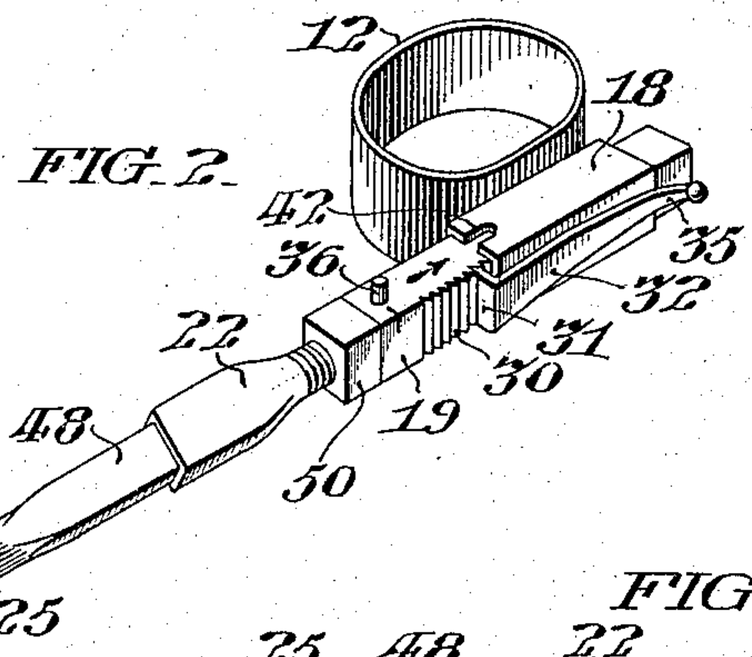



FIG. 3.

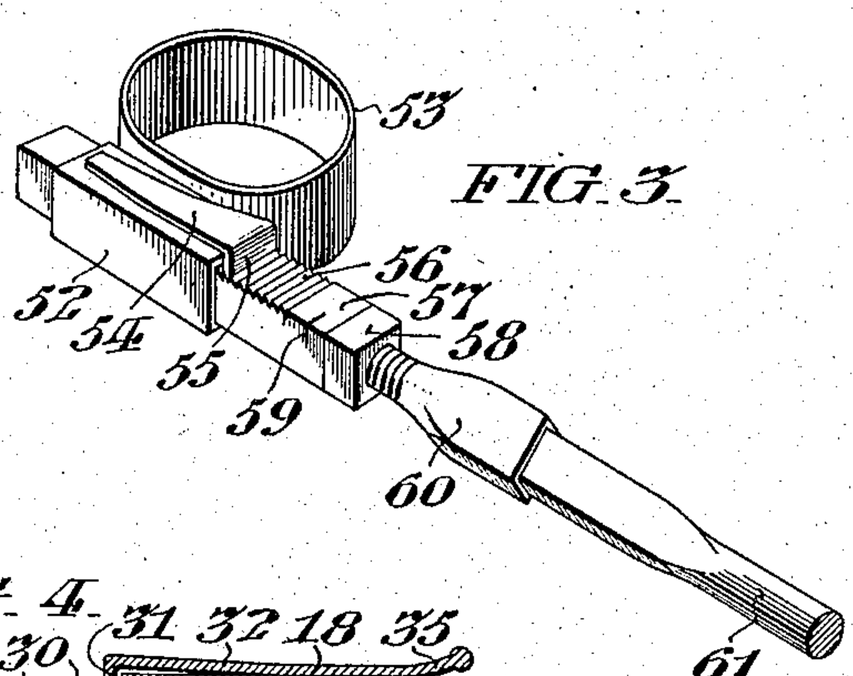



FIG. 4.

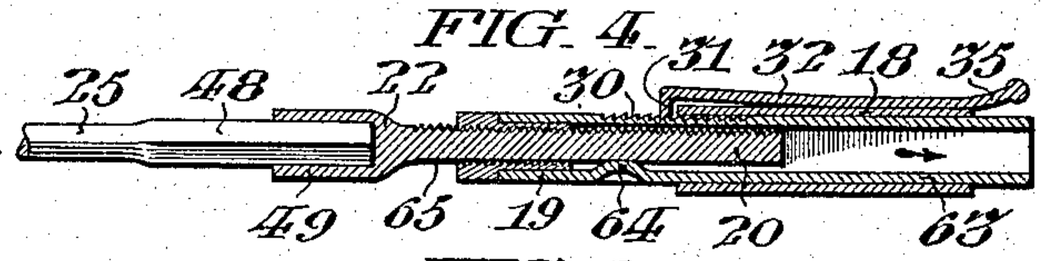



FIG. 5.

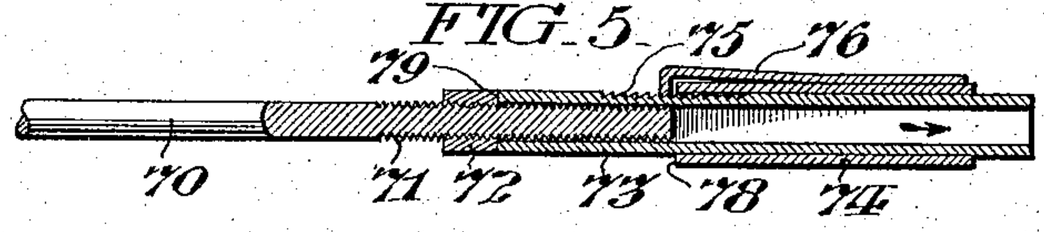



FIG. 6.

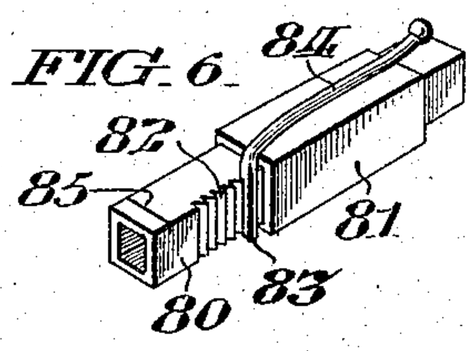



FIG. 7.

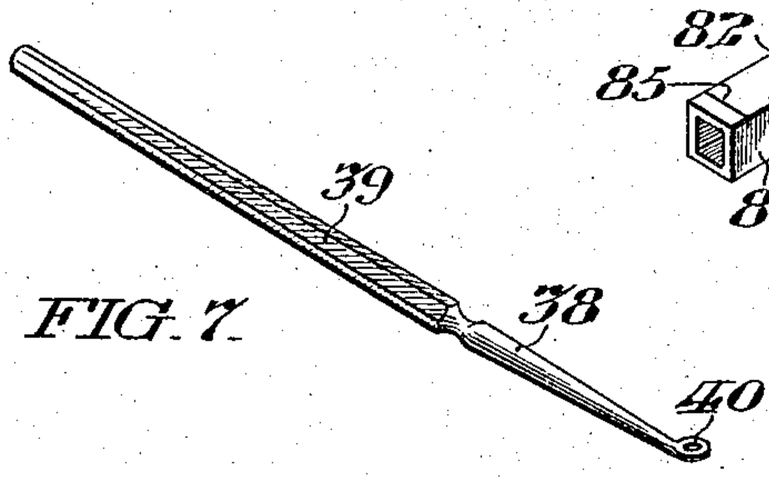
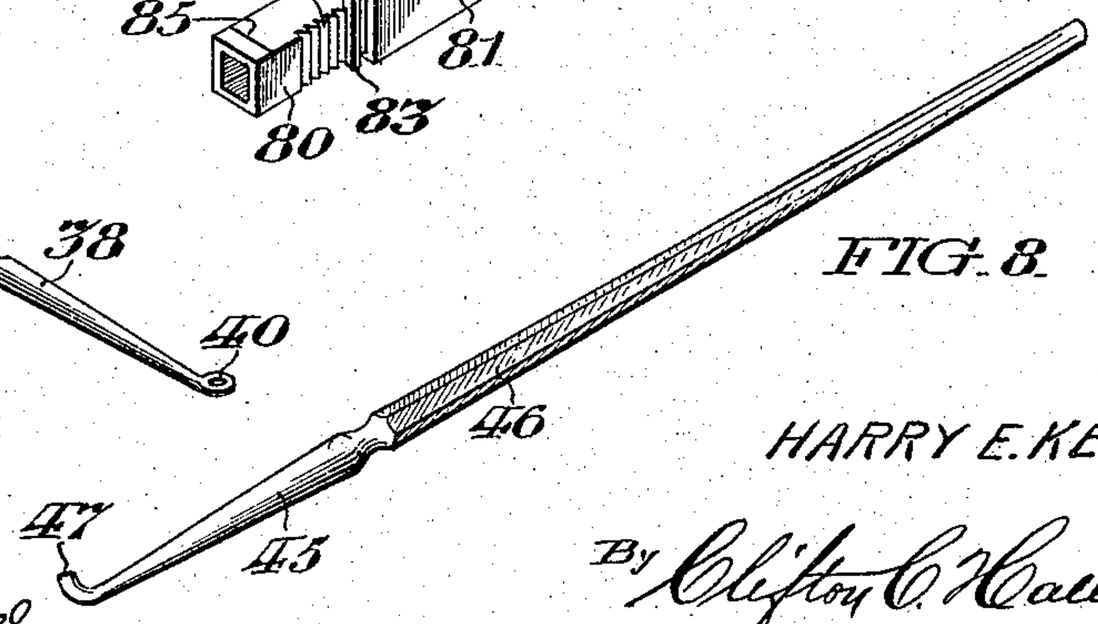



FIG. 8.




Witnesses

William J. Russell

H. A. Toward

Inventor

HARRY E. KELSEY,

By Clifton C. Calloway

Attorney.

# UNITED STATES PATENT OFFICE.

HARRY E. KELSEY, OF BALTIMORE, MARYLAND.

## ORTHODONTIC APPLIANCE.

1,166,766. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed January 15, 1914. Serial No. 812,185.

*To all whom it may concern:*

Be it known that I, HARRY E. KELSEY, a citizen of the United States, and a resident of Baltimore, State of Maryland, have invented certain new and useful Improvements in Orthodontic Appliances, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates particularly to that class of tooth-regulating devices comprising an expansion arch-bow substantially conforming to the dental arch and having its opposite ends connected by longitudinally adjustable threaded terminal sections, with suitable anchor members securely fitted to selected anchorage teeth of the dental arch, the adjustment being effected by nuts on said threaded sections, abutting against said anchor members.

While certain well known and universally employed devices of this character are highly efficient and generally meet all of the requirements for which they were designed, it has been found in practice that considerable time, labor and patience are required to attach the arch-bow to, and detach it from, its terminal anchorages, the operation being not only unnecessarily tedious but exceedingly trying to both the operator and the patient.

It is the principal object of my invention to obviate the difficulties above referred to by providing such orthodontic devices with mechanism connecting the arch-bow with its terminal anchor members, that may be released and manually shifted longitudinally, irrespective of the threaded connection, to instantly free or connect said arch-bow with its anchorages, as desired.

Other objects of my invention are, to provide an orthodontic appliance with an abutment for the adjustable nut, free to slide longitudinally with respect to the anchorage; and to provide a detent engageable with said abutment to retain it in different longitudinally adjusted positions to vary the extent of said arch-bow.

My invention further comprehends slidably adjustable mechanism between the adjusting nut and anchorage, of such universal character as may be as readily employed in connection with an arch-bow having its ends threaded, as with an arch-bow having separable threaded end sections.

Specifically stated, my invention comprises an anchor member having a slidably adjustable abutment for the threaded adjustable means of the expansion arch, which may be shifted with respect to said anchor member, independently of the threaded adjustable means, to release the arch-bow from said anchor member, and a detent arranged to retain said abutment in any adjusted position.

My invention further includes all of the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is an inverted plan view of the upper dental arch showing a convenient embodiment of my invention attached thereto; Fig. 2 is a perspective view of the tooth anchorage mechanism shown on the left-hand side of Fig. 1, and including a fragment of the arch-bow connected therewith; Fig. 3 is a perspective view similar to Fig. 2, but showing a slight modification in the position of the detent with respect to the anchor-band; Fig. 4 is a central longitudinal sectional view taken horizontally through the adjustable members of the anchorage illustrated in Fig. 1, the arch-bow being shown in elevation for convenience of illustration; Fig. 5 is a longitudinal sectional view similar to Fig. 4, showing the threaded end of an arch-bow directly connected with the adjustable anchorage mechanism; Fig. 6 is a perspective view of another modification of my invention; Fig. 7 is a tool devised for conveniently manipulating the adjustable abutment connecting the arch-bow with its anchorage; and Fig. 8 is another form of tool, adapted to either release the spring detent or to engage a suitable notch in the adjustable abutment, for shifting the same.

The general application of my invention is best illustrated in Fig. 1, wherein the tooth anchor members 10 and 11, respectively having anchor-bands 12 and 13, are conveniently connected to the anchorage comprising the first molars 14 and 15 of the dental arch 16. Said anchor members each comprise a tubular sheath or sleeve serving as a guide 18 into which is fitted, in telescopic relation therewith, a hollow abutment 19 arranged to receive the free end of the threaded shank 20 of the end section 22.

The end section 22 is of common construction and provides a separable extension for

the arch-bow 25, which has its ends fitted in the section 22 and is conveniently attached in any suitable manner with tooth-bands 27 adapted to securely embrace selected teeth of the dental arch, which, as illustrated in Fig. 1, comprise the central and lateral incisors.

As best shown in Figs. 2 and 4, the abutment 19 is provided with a series of ratchet teeth 30 in one side thereof, preferably the buccal side, arranged to be engaged by the free end 31 of the spring pawl or detent 32, which is suitably secured to the sheath 18 in any desired manner, for instance, by solder. Said spring pawl 32 may, if desired, be extended rearwardly to form a hook or suitable attaching member 35 for connection with any of the well-known tension actuated devices for retracting the teeth of the dental arch.

The abutment 19 is preferably provided with a pin or projection 36, which may be engaged by any suitable means, for instance, by the tool 38 shown in Fig. 7, having the handle 39 and the eye 40 arranged to embrace, and thereby engage, said pin or projection 36 to effect the longitudinal movement of the abutment 19, by a single thrust effected by the operator, the sheath 18 being provided in the forward end of one side thereof with a recess 42 in alinement with said pin 36, so that said pin may be received therein when the abutment 19 is retracted in the direction of the arrow in Fig. 4.

The abutment may be conveniently released by withdrawing the detent or pawl 32 from engagement with the ratchet teeth 30 in any suitable manner, for instance, by the tool 45 having the handle 46 and the point or blade 47, which, as best shown in Fig. 8, is slightly twisted out of the plane of the axis of said tool so as to be conveniently inserted between the free end of the pawl 32 and the adjacent wall of the sheath 18, when held by the operator.

The arch-bow 25, shown in Figs. 2 and 4, is of the class having a squared end 48 fitted into a similarly shaped socket 49 in the threaded end section 22, which is provided with an adjustable nut 50 rotatable on the threaded shank 20 to delicately vary the extent of longitudinal expansion of the arch-bow 25, said nut 50 being rotated on the threaded shank of the end section 22 in engagement with the end of the abutment 19 to effect such adjustment.

It may be here noted that in devices of this character as heretofore constructed, the nut 50 was arranged to be rotated on the threaded shank of the end section 22 in engagement with the sheath of the stationary anchor member, and therefore, in order to retract the end section 22 sufficiently to withdraw it from engagement with the end of the arch-bow 25, it was necessary to rotate said nut on the threaded shank sufficiently to afford a longitudinal movement of the end section, equal to the depth of the socket 49.

In the present invention no such tedious rotation of the nut is required to release the arch-bow, as the abutment itself, upon the release of the detent 32, is free to be shifted by an instantly effected longitudinal movement of both the abutment 19 and the end section 22, to such extent as to free said end section from the end of the arch-bow 25.

Although the spring pawl 32 is shown in Fig. 2 as being buccally disposed, it is to be understood that it may be otherwise situated, as for instance, as shown in Fig. 3, wherein the sheath 52 of the anchor-band 53 is provided with a spring pawl 54 having its free end 55 in engagement with ratchet teeth 56 on the abutment 57, said spring pawl 54 and ratchet teeth 56 being either gingivally or incisively disposed on said sheath 52 and abutment 57, respectively.

The abutment 57 for the nut 58, as shown in Fig. 3, is provided with a notch 59 formed by a saw-cut or otherwise, which may be conveniently engaged with any suitable form of tool, such as by the blade 47 of the tool 45, to effect the longitudinal movement of the abutment 57 in order to free the end section 60 from the end of the arch-bow 61.

As shown in Fig. 4, the wall 63 of the abutment 19 may be provided with the inward projection 64, struck up therefrom and arranged to engage the flat side 65 of the shank 20 of the threaded end section 22 to prevent its rotation in said abutment. This projection, however, may be dispensed with if the abutment is to be employed with an arch-bow and threaded end section of the rotatable type.

Although I have described my invention as being applied to an arch-bow provided with removable terminal sections having threaded shanks, it is to be understood that my invention may be as readily employed with an arch-bow having threads directly formed therein, as shown in Fig. 5, wherein the arch-bow 70 is provided with threads 71 having the threaded nut 72 adjustable thereon and arranged to abut against the abutment 73, which is slidably mounted for adjustment in the sheath 74, and which is provided with ratchet teeth 75 for the engagement of the free end of the spring pawl or detent 76 carried by said sheath 74. It will be noted, however, in this form of my invention, that the arch-bow 70 must be of such length as to terminate free of the forward end 78 of said sheath 74, so that when the abutment 73 is retracted in the direction of the arrow thereon to a position where its forward end 79 registers with the forward

end 78 of the sheath 74, said arch-bow 70 may be freed therefrom and capable of a lateral movement relative thereto.

In the form of my invention shown in Fig. 6, the abutment 80 is slidably mounted for longitudinal adjustment in the sheath 81, and is provided with ratchet teeth 82 arranged to be engaged by the spring pawl or detent 83, which may be formed of spring wire 84 secured along one side of said sheath 81 and bent forwardly of and into the plane of an adjoining side of said sheath 81, in engagement with the teeth 82. In this form of my invention I have indicated a notch or saw-cut 85 extending across one wall of the abutment 80, for the convenient engagement of a suitable tool, whereby the operator may shift the abutment 80 longitudinally in its sheath 81.

From the foregoing description it will be obvious that the arch-bow may be instantly detached from its anchorages by a single longitudinal movement of the abutment and the means for more delicately adjusting said arch-bow, with respect to the anchorages, by a single movement of the adjustable abutment, which may be effected by a direct thrust of the operator; said abutment may be similarly shifted in the opposite direction to connect the arch-bow and its anchorages, whereby the long and tedious operation of rotating the nut upon the threaded sections of the arch-bow for connecting and disconnecting said arch-bow for manipulation, is obviated.

Although I have shown the abutment and its sheath as being formed of square tubing, it is to be understood that they may be flat, round, oval, or in fact of any desired configuration, and therefore I do not desire to limit my invention to the precise details of construction and arrangement herein set forth, as it is obvious that other modifications may be made therein without departing from the essential features of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. In a tooth-regulating appliance comprising an arch-bow having adjustable means and an anchorage therefor, the combination with an anchor member, of an adjustable abutment for the adjustable means on said arch-bow, and a detent arranged to retain said abutment in different adjusted longitudinal positions with respect to said anchor member.

2. In a tooth-regulating appliance comprising an arch-bow having adjustable means, the combination with an anchor member having a guide, of an adjustable abutment for the adjustable means on said arch-bow, said abutment being mounted to slide in said guide and having a plurality of depressions, and a spring detent on said guide yieldingly engageable with said depressions to retain said abutment in different adjusted positions with respect to said anchor member.

3. In a tooth-regulating appliance comprising an arch-bow having adjustable means, the combination with an anchorage having a member serving as a guide, of an adjustable abutment for the adjustable means on said arch-bow, said abutment being mounted to slide in said guide and having a plurality of ratchet teeth, and a pawl on said guide yieldingly engageable with said teeth to retain said abutment in different adjusted positions.

4. In a tooth-regulating appliance for use in connection with an arch-bow, the combination with an anchorage having a member serving as a guide, of an adjustable abutment mounted for reciprocation in said guiide and arranged to receive the end of said arch-bow, and a detent on said guide detachably engaged with said abutment, and having means tending to permit the longitudinal movement of said arch-bow in one direction and prevent such movement in the other direction.

5. A tooth-regulating appliance to be used in connection with an arch-bow having adjustable means thereon, an anchor member having a sleeve provided with a recess, an abutment for the adjustable means on said arch-bow, slidably mounted in said sleeve, means for retaining said abutment in variably adjusted positions in said sleeve, and a projection on said abutment engageable with a suitable tool for manually shifting said abutment longitudinally in said sleeve, said projection being arranged to enter said recess in the retracted position of said abutment.

6. A tooth-regulating appliance to be used in connection with an arch-bow having threaded adjustable means thereon, an anchor member having a sleeve provided with a recess at one end thereof, an abutment for said threaded adjustable means having serrations in the side thereof, a spring detent carried by said sleeve and having its free end arranged to engage said serrations to retain said abutment in adjusted position, and a projection on said abutment engageable with a suitable tool for manually shifting said abutment into and out of engagement with said arch-bow, the retracted position of said abutment being limited by the engagement of said projection in said recess.

7. A tooth-regulating appliance for use in connection with an arch-bow having threaded adjustable means, comprising an anchor member having means serving as a guide, an abutment for said arch-bow longitudinally slidable in said guide and having means engageable with a suitable tool, whereby it may be shifted in said guide by the oper-

ator with respect to said arch-bow, and having means to prevent the rotation of said arch-bow with respect to said abutment.

8. A tooth-regulating appliance to be used in connection with an arch-bow having threaded adjustable means, comprising an anchor member having a tubular support, an abutment for said threaded adjustable means, mounted for longitudinal reciprocation in said tubular support and having external serrations, means engageable by a suitable tool whereby the operator may directly shift said abutment in said support with respect to said arch-bow, the internal projection affording means to prevent the rotation of said arch-bow with respect to said abutment.

9. A tooth-regulating appliance for use in connection with an arch-bow having threaded adjustable means, comprising an anchor member, an abutment for said adjustable means, slidably supported by said anchor member, and a detent arranged to retain said abutment in different adjusted positions, and having one end extended to provide attaching means for tension actuated mechanism.

10. A tooth-regulating appliance, comprising an arch-bow and an anchorage therefor including an anchor tube, and means for connecting said arch-bow with said anchorage, comprising a member telescopically mounted to reciprocate in said anchor tube and forming a supporting abutment for said arch-bow.

In witness whereof, I have hereunto set my hand this 12th day of January, 1914.

HARRY E. KELSEY.

Witnesses:
ADRIAN J. GRAPE,
WALTER H. BILLINGSLEA.

Certificate of Correction in Letters Patent No. 1,166,766.

Cl. 32—19.

It is hereby certified that in Letters Patent No. 1,166,766, granted January 4, 1916, upon the application of Harry E. Kelsey, of Baltimore, Maryland, for an improvement in "Orthodontic Appliances," an error appears in the printed specification requiring correction as follows: Page 4, line 14, claim 8, for the word "the" read *and an;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of January, A. D., 1916.

[SEAL.]

R. F. WHITEHEAD,

*Acting Commissioner of Patents.*