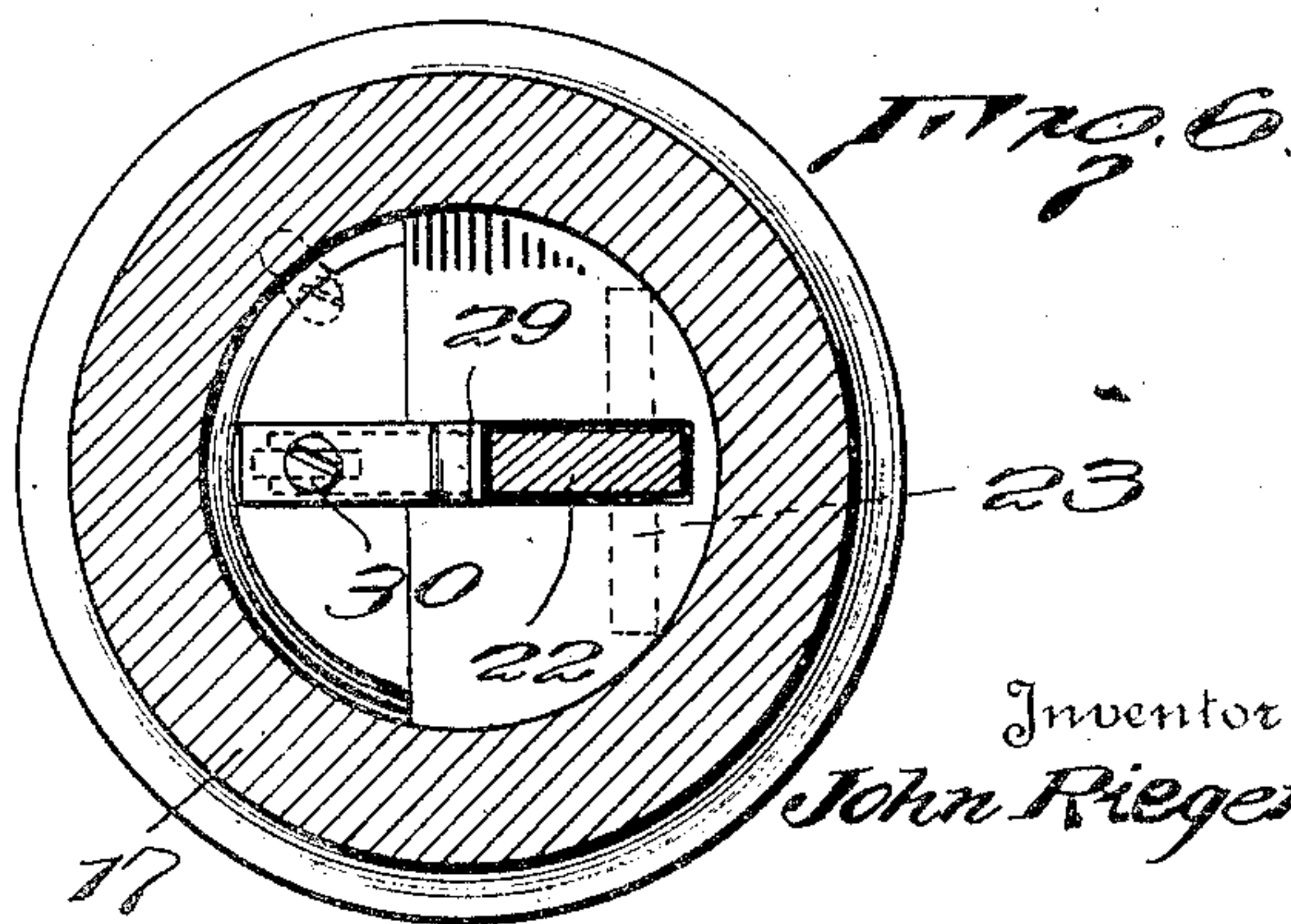
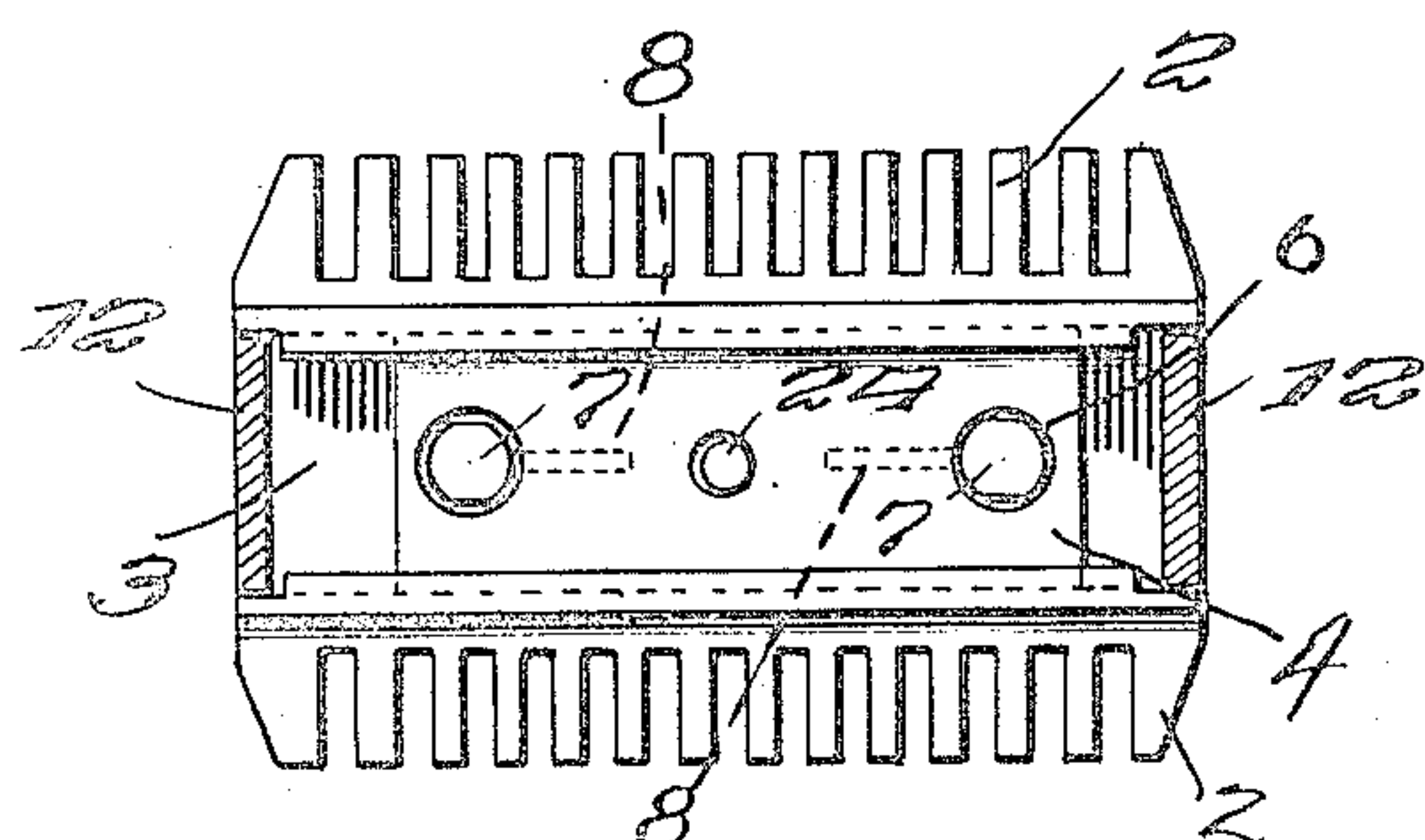
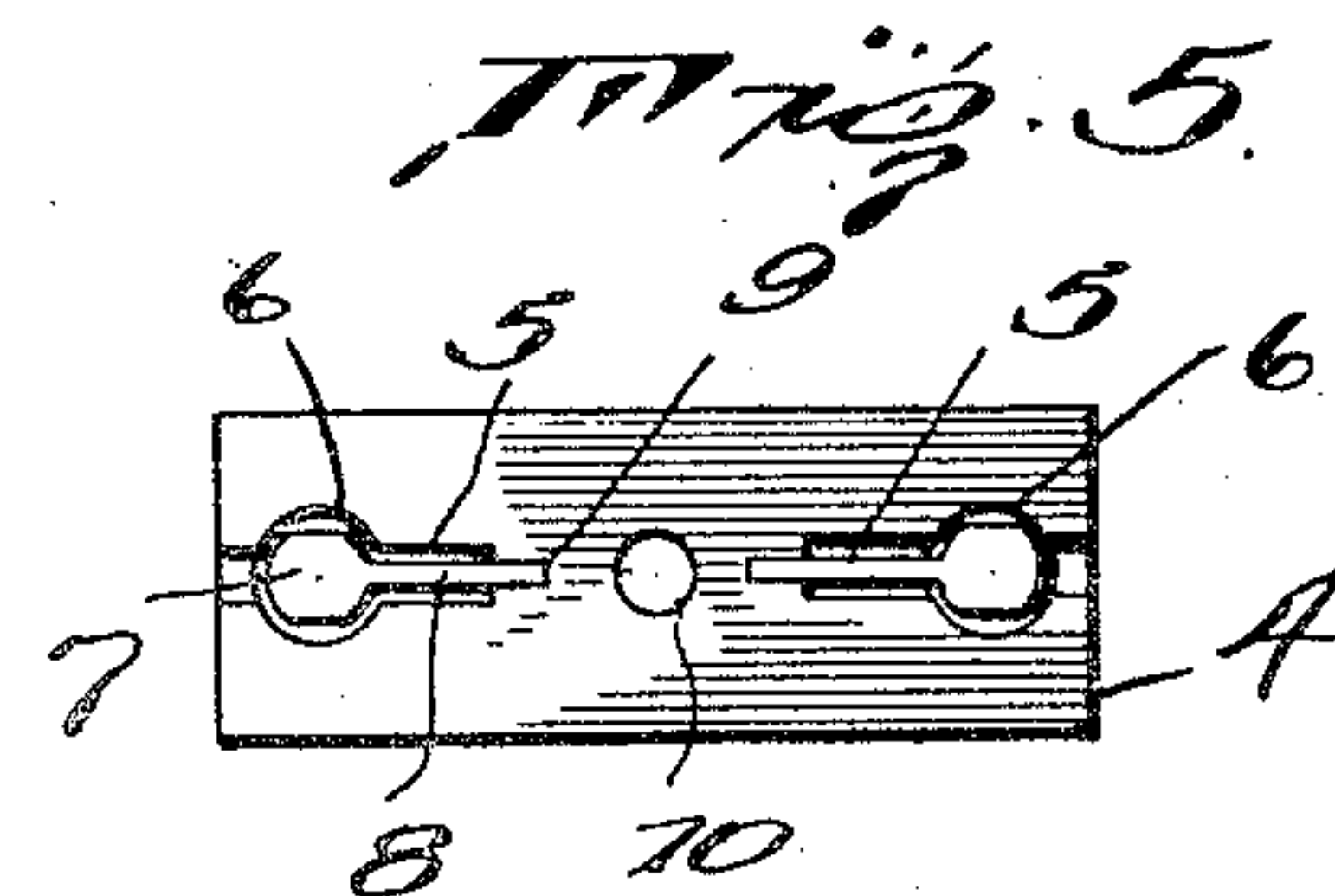
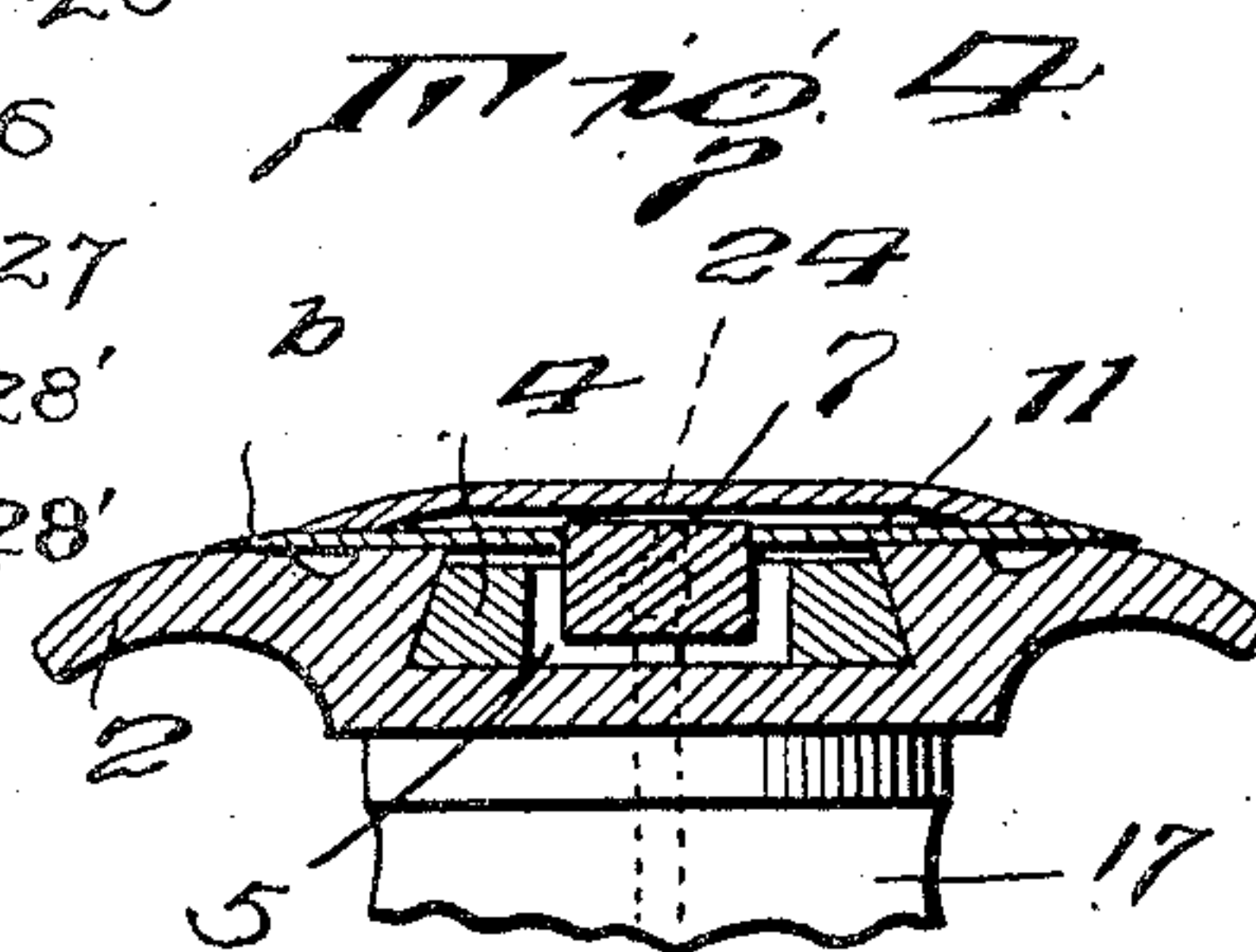
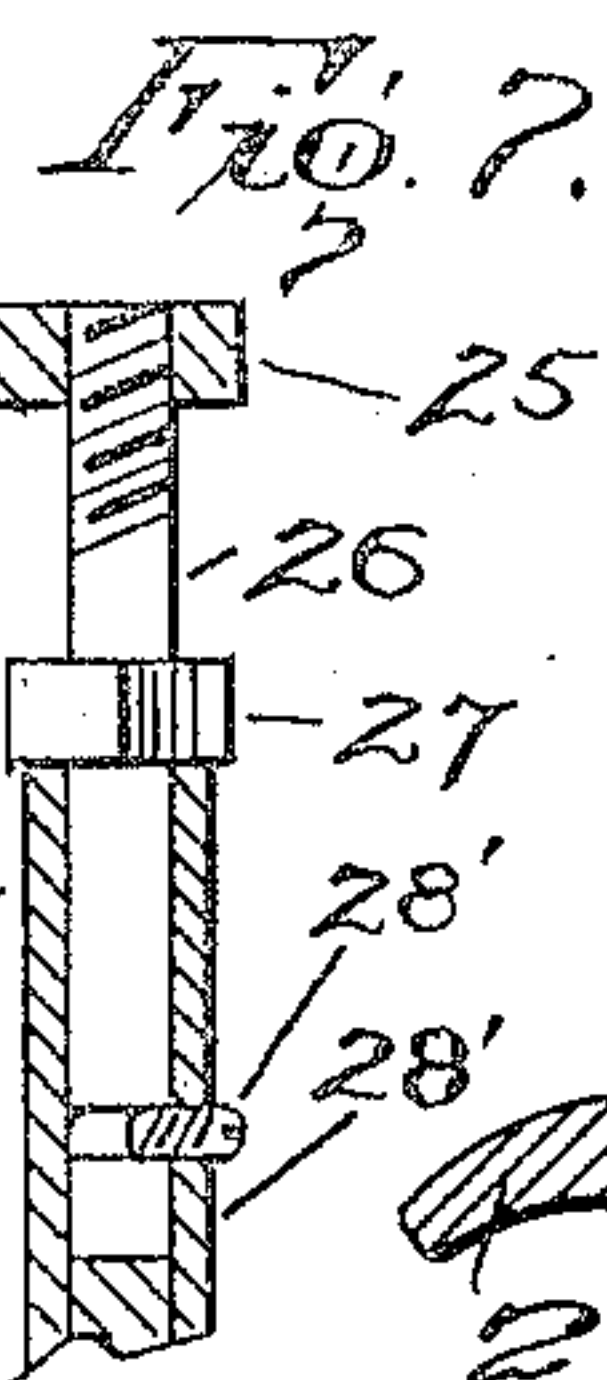
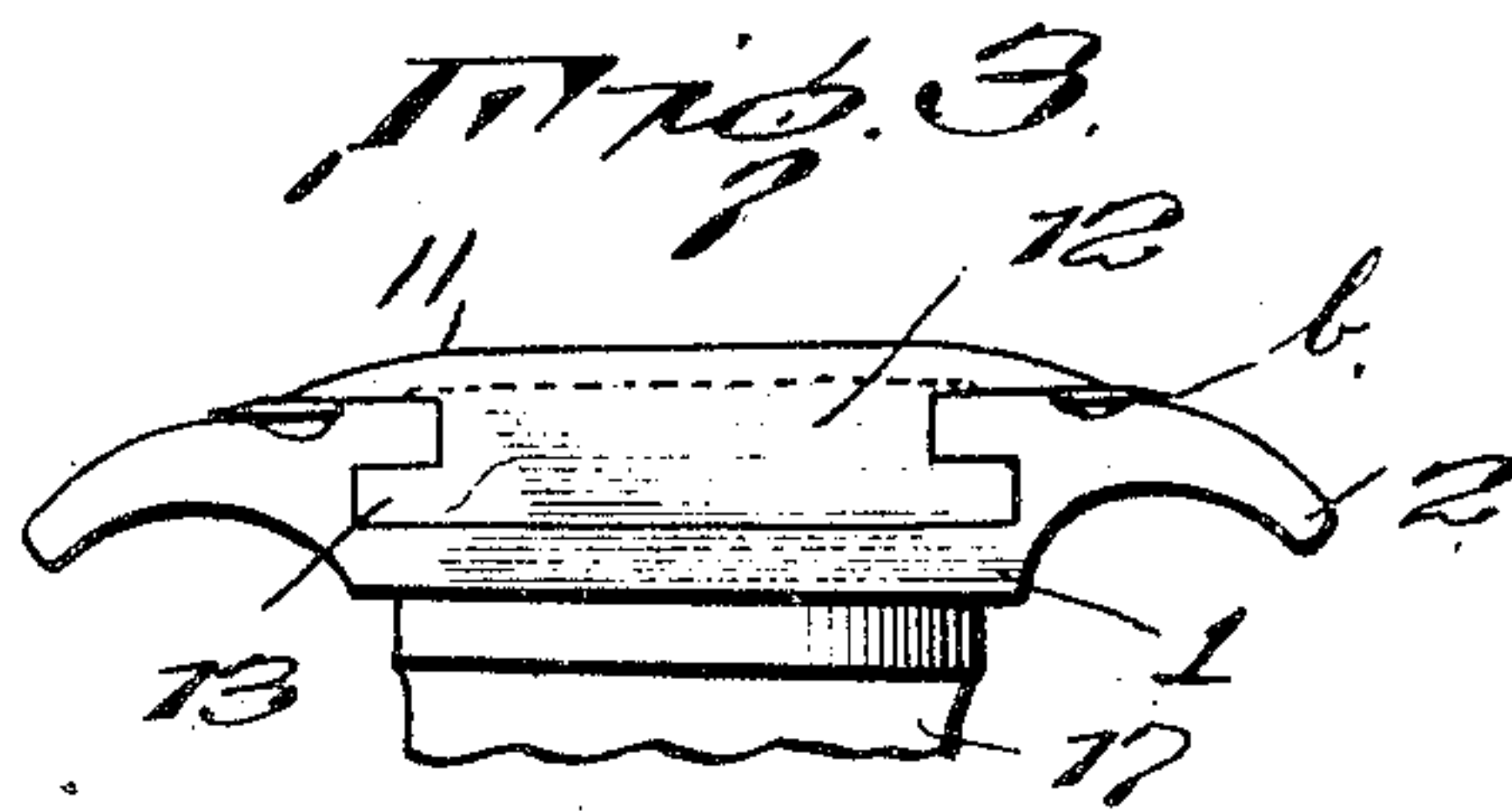
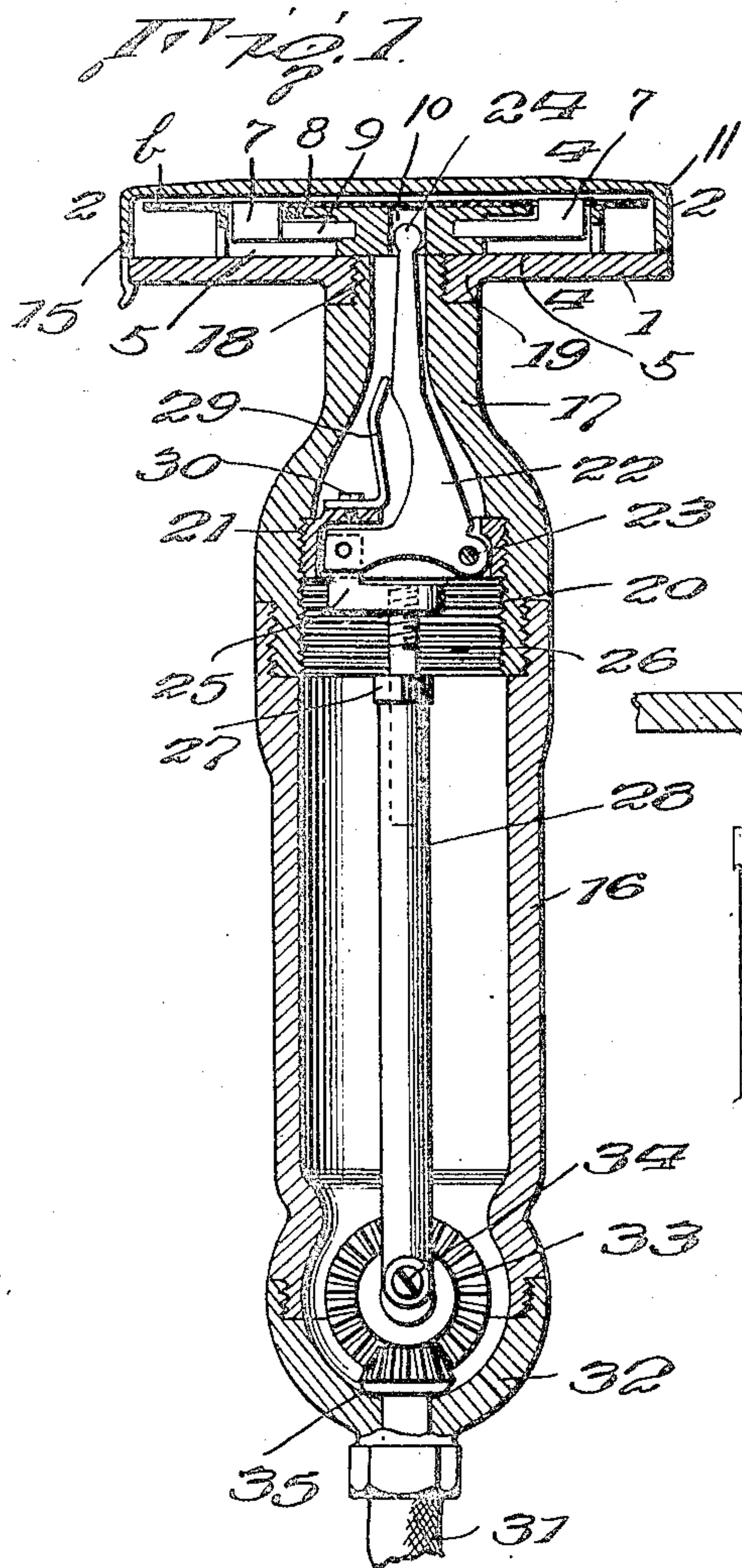


Jan. 2, 1923.

1,441,172.

J. RIEGER.  
SAFETY RAZOR.  
FILED JULY 13, 1921.



Inventor  
John Rieger

By William C. Linton.

Attorney



Patented Jan. 2, 1923.

1,441,172

# UNITED STATES PATENT OFFICE.

JOHN RIEGER, OF WATERFORD, CONNECTICUT.

SAFETY RAZOR.

Application filed July 13, 1921. Serial No. 484,466.

*To all whom it may concern:*

Be it known that I, JOHN RIEGER, a citizen of the United States of America, residing at Waterford, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Safety Razors; and I do hereby declare that the following is 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.

This invention has reference to improvements in safety razors, having for an object to provide a vibratory safety razor having a simple and practical form of motion transmitting means therefor, whereby the razor blade will be caused to rapidly reciprocate as it is moved over the face of a user, thus, effectually removing the beard without irritation.

It is another object of the invention to provide means whereby the extent of reciprocatory movement of the razor blade may be varied to suit the individual requirements of a user.

Yet another object of the invention is to provide a novel blade holder for the razor, the blade engaging pins of which are so mounted thereon that they may be adjusted to promptly engage in the openings therefor in a blade irrespective of whether these openings are in alignment or not.

Other objects will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by persons skilled in the art, I have in the accompanying illustrative drawings and in the detailed following description based thereon, set out one possible embodiment of the same.

In these drawings:

Fig. 1 is a vertical longitudinal section through the improved razor;

Fig. 2 is a horizontal section taken on the line 2—2 of Figure 1;

Fig. 3 is an end elevation of the holder portion of the razor;

Fig. 4 is a vertical transverse section taken on the line 4—4 of Figure 1;

Fig. 5 is a bottom plan view of the blade carriage;

Fig. 6 is a horizontal section taken through the handle portion of the razor; and

Fig. 7 is a detail sectional view.

Having more particular reference to the

drawings, in connection with which like characters of reference will designate corresponding parts throughout the several views, 1 represents the substantially rectangular blade holder having guards 2 formed on its opposite side portions, while a longitudinally disposed under cut groove 3 is formed in the upper side of said holder and is adapted to receive the rectangular blade carriage 4 therein, which carriage, as will be noted, is slidable in the groove and has its upper surface arranged substantially flush with the upper surface or face of said holder.

The blade carriage 4, which is substantially rectangular in shape, is formed with pockets 5, which pockets communicate with circular openings 6 also in the carriage, the latter receiving therein blade engaging pins or studs 7, which in turn are carried upon spring arms 8 positioned in said pockets 5 and having their inner ends embedded or anchored in any suitable manner in the carriage 4 as indicated at 9. In this connection, it is to be noted that the several longitudinal pockets 5 open onto the under or lower side of the carriage 4 and have arranged between the same a circular pocket or recess 10, the purpose of which will be hereinafter more fully described. Obviously, due to the spring mounting of the razor blade engaging pins 7, these pins will be provided yieldable support and by consequence, can be readily adjusted to freely enter the openings provided therefor in a razor blade, irrespective of whether said openings in the blade are disaligned or not. In addition to this, the spring mounted pins will also provide a yieldable mounting for a razor blade engaged thereby and thus, will enable the cutting end of the blade to adjust itself to the face of a user as the same is moved thereover.

As means for locking the razor blade are positioned upon the engaging pins 7, a planting plate 11 is provided, and as will be noted, is concave convex in construction and has flanges 12 formed on its opposite ends, one of which carries bearing pintles 13, receivable in recesses formed in the corresponding end of the holder 1, while the other end thereof carries a spring latch 15 adapted to be snapped over the remaining end of the holder, which, if desired, may be formed with a pocket for receiving said latch.

From the above, it will be understood,



that when a razor blade such as indicated by the letter "b" has been engaged with the pins 7 on the carriage 4, the clamp 11 is placed in position upon the blade holder 1 by first engaging the bearing pintles 13 in the openings therefor and then swinging the remaining end downwardly until the spring latch 15 snaps over the corresponding end of said holder. With the clamp in position, the blade "b" will be securely maintained in its flexed position over the upper face of the blade holder 1 and the carriage 4, and while it will be allowed free longitudinal movement, its displacement by reason of undue lateral movement with relation to the holder and the carriage will be prevented.

A hollow handle 16 is provided the razor and has one end thereof internally screw threaded and adapted for engagement with the correspondingly threaded portion of a tubular shank 17, which, as will be noted carries a screw-threaded nipple 18 on its reduced end in order that the same may be turned into engagement with the internally screw threaded eye 19 formed on the base of the blade holder 1. In this connection, it will be noted that the tubular shank 17 flares outwardly in order that the same will be brought to a diameter corresponding to the diameter of the hollow handle 16 in order that it will properly house the motion transmitting means which are to be presently described.

Turned into engagement with an internally screw threaded portion 20 of the tubular shank 17 is a circular plate 21 having a slot formed therein for receiving the lower portion of an angle lever or as it may be more properly termed a bell crank lever 22, said lever being pivoted to the plate 21 as at 23 while the upper portion of the same extends through the tubular shank 17 into engagement with the circular pocket 10 in the blade carriage 4 whereat it is provided with a spherical head 24 in order that an effectual connection as between said carriage and the same will be provided. An angle arm 25 is fixedly secured to the remaining or free end of the lever 22 and has a screw 26 adjustably mounted in its free portion, which screw carries a stop collar or nut 27. The lower end of this screw 26 extends longitudinally through the hollow handle 16 and may be retained therein by means of a set screw 28'. This set screw 28' retains the screw 26 within the tubular pitman 28 but permits the screw 26 to revolve or turn, by twisting the nut 27 with a wrench or any suitable tool, whereby the threaded portion of the screw 26 will engage the angle arm and the latter be adjusted with respect to the tubular pitman 28. A spring finger 29 is mounted on the upper side of the annular plate 21 as at 30 and has its free portion engaging the intermediate parts of the upper

portion of the bell crank lever 22 whereby said spring serves to eliminate the noise of the vibrator and also to compensate for any lost motion that should arise due to loosenings at 23 and 25.

To impart reciprocatory motion to the blade carriage 4, a flexible shaft 31 is engaged with the free end of the handle 16 which as will be noted is provided with exposure cap having screw threaded engagement with a corresponding portion of the handle 16 and serving to house a bevel gear 33 rotatably mounted in the lower end of said handle, which gear, in turn, has eccentric connection with the lower end of the tubular pitman 28 as at 34. A pinion 35 is mounted on the inner end of the flexible shaft 31 and connects with the bevel gear 33, whereby a reciprocatory motion will be imparted to the tubular pitman 28 for oscillating the bell crank lever 22, which latter due to the movement of the upper end thereof carrying the spherical head 24 will impart reciprocal motion to the blade carriage 4 slidably mounted in the blade holder 1.

The operation of my improved razor may be reviewed as follows:

Rotary movement from the flexible shaft 31 is transmitted to the bevel gear 33 through the medium of the pinion 35, from whence it is taken up in form of reciprocatory movement by the tubular pitman 28. This reciprocal movement of the pitman 28 will be directed to the oscillatory bell crank lever 22 having connection with the blade carriage 4, which carriage by reason of the movement of the free end of said lever 22 carrying the spherical head 24 will be caused to rapidly reciprocate in the groove 3 formed in the razor blade holder 1. Due to this reciprocal or vibratory movement of the carriage 4 on which the blade "b" is arranged, it will be understood that said blade when moved over the face of a user will faction to cleanly remove the beard therefrom without irritation such as is commonly caused in those types of razors of the so-called safety type by the dragging action of the same as they are moved over a user's face. Also, by reason of the vibratory motion of the blade "b" as the razor is used over the user's face, the very desirable sheering cut practiced in shaving will be had.

Should it be desired to limit the extent of reciprocatory or vibratory movement of the carriage 4 with respect to the blade holder 1, it is only necessary to adjust the tubular pitman 28 on the connecting screw 26 which in turn will either decrease or increase the oscillatory movement of the bell crank lever 22, as may be desired.

Attention is directed to the double edge arrangement of the improved razor which will permit of the use of both edges of the same notwithstanding the connection of the



vibrating means therewith, the latter being of such a character as to allow free reversing of the blade when desired. Of course, however, a single end blade may be used equally well.

Furthermore, the invention may be used as an attachment upon the usual form of safety razors merely by removing the head thereof and replacing the same with the improved device together with the connection for transmitting vibratory motion.

Manifestly, the construction shown is capable of considerable modification and such modification as is within the scope of my claims, I consider within the spirit of my invention.

I claim:

1. A vibratory razor, comprising a holder having a longitudinal groove formed therein in a carriage slidable in said groove, blade securing means, a tubular shank engaging said holder, a hollow handle on the shank, an angle lever mounted in the tubular shank having one of the ends thereof extended through said shank into loose engagement with the carriage, motion transmitting means adjustably connected to the remaining end of said lever, and a compensating element adapted to engage said angle lever.

2. A vibratory razor, comprising a holder having a longitudinal groove formed therein, a carriage slidably received in said groove, blade planting means, a tubular shank engaging the holder, a hollow handle on the shank, an angle lever mounted in the tubular shank having one portion thereof elongated and extended through said shank into loose engagement with the carriage, a spring mounted in the tubular shank engaging said elongated portion of the angle lever, an angle arm fixedly secured to the remaining end of the angle lever, a screw carried by said angle arm, and a tubular pitman extending through the hollow handle and adjustably engaged with said screw.

3. In a razor a holder having a longitudinal groove formed in one face thereof, a blade carriage slidably mounted in said groove having openings therein, and blade engaging pins yieldably mounted in said opening.

4. In a razor a holder having a longitudinal groove formed in one face thereof, a carriage slidably received in said groove having longitudinal pockets formed in its

lower face communicating with circular openings therein, spring arms arranged in said pockets and engaging the carriage having their outer ends extending into the circular openings, and blade engaging pins in said circular openings and carried on the free ends of said spring arms.

5. The combination with a vibratory razor having a blade, a carriage for said blade and a holder to receive the blade and carriage, said carriage having an opening therein, of a tubular shank engaging said holder, a bell crank lever pivotally mounted in said tubular shank having one portion thereof elongated and extending into the opening in said carriage, spring means engaging said elongated portion of the bell crank lever, a hollow handle carried by the shank, an angle arm secured to the free end of said bell crank lever, a connecting screw carried on the free portion of said angle arm, a tubular pitman extending longitudinally through the hollow handle into engagement with said connecting screw, and means for imparting reciprocatory motion to the tubular pitman.

6. The combination with a vibratory razor having a blade, a carriage for said blade, and a holder for the blade and carriage, said carriage having an opening therein, of a tubular shank, a circular plate arranged in said shank and having a slot therein, a hollow handle engaging said shank, a semi-spherical cap in threaded engagement with said handle, a flexible shaft engaging said semispherical cap, a pinion carried by said flexible shaft, a bevel gear mounted within said cap, a tubular pitman mounted eccentrically of said bevel gear, a bell crank lever pivotally mounted in the slot in said circular disk and having one end portion thereof elongated and extended within the opening in the blade carriage, a spring mounted on said circular disk and engaging the elongated portion of the crank lever, an angle arm fixedly secured to the free end of said bell crank lever, a connecting screw carried on the free portion of said angle arm and adapted to adjustably secure said connecting screw to the free end of said tubular pitman, as and for the purpose set forth.

In witness whereof I have hereunto set my hand.

JOHN RIEGER.