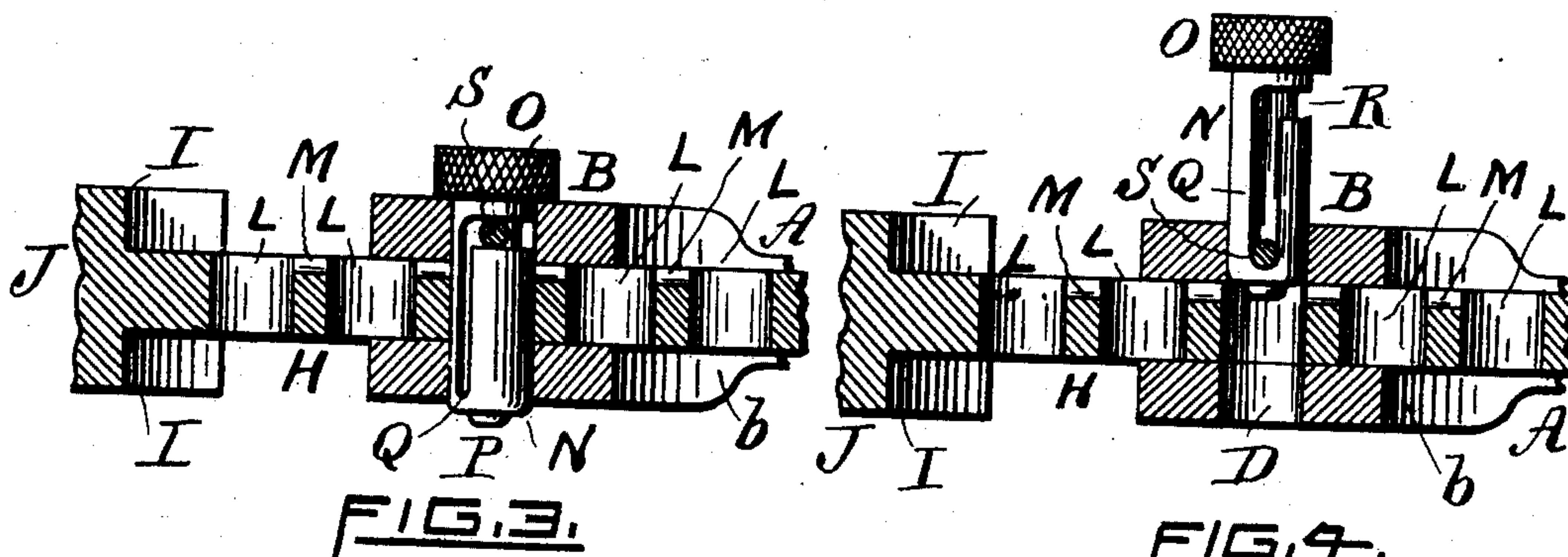
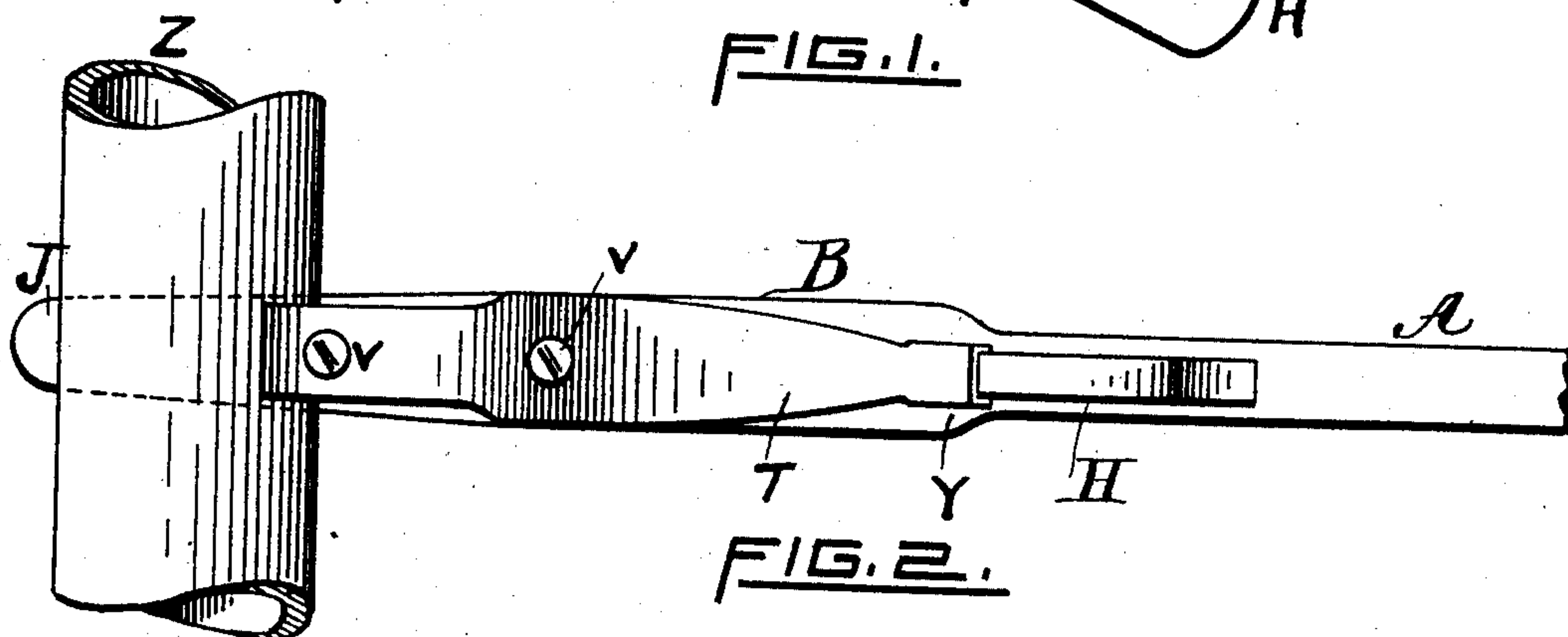
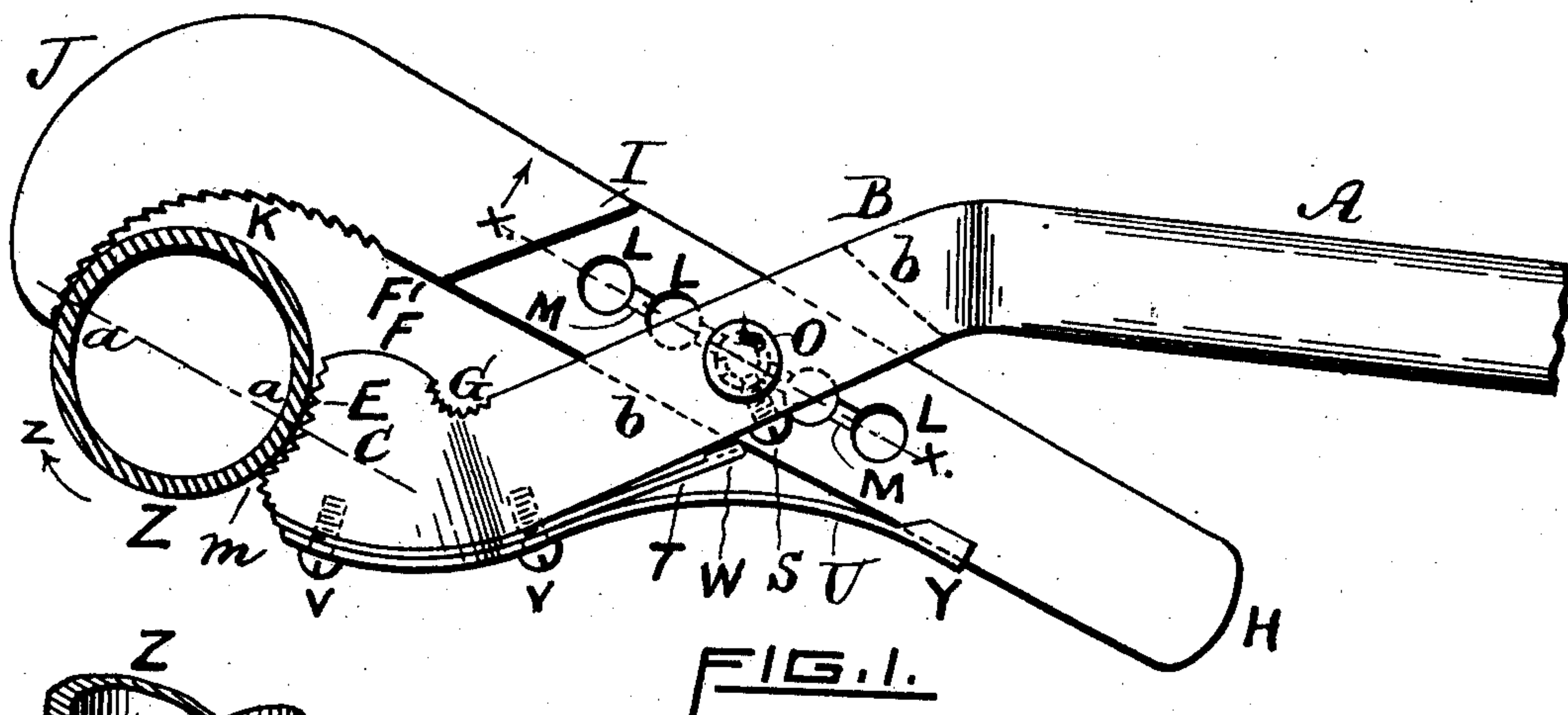


No. 826,728.

PATENTED JULY 24. 1906.

J. G. LIND.  
PIPE WRENCH.

APPLICATION FILED NOV. 29, 1905.



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# UNITED STATES PATENT OFFICE.

JAMES G. LIND, OF PROVIDENCE, RHODE ISLAND.

## PIPE-WRENCH.

No. 826,728.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed November 29, 1905. Serial No. 289,645.

*To all whom it may concern:*

Be it known that I, JAMES G. LIND, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Pipe-Wrenches, of which the following is a specification, reference being had therein to the accompanying drawings.

10 Like reference-letters indicate like parts.

Figure 1 is a side elevation of my improved pipe-wrench. Fig. 2 is a bottom plan view of the same. Fig. 3 is a view in elevation of the hinge-pin and of the two handles as seen 15 in section on line *xx* of Fig. 1 when the hinge-pin is in operative position. Fig. 4 shows the same parts as Fig. 3, but with the hinge-pin in inoperative position.

My invention is an improvement on the 20 pipe-wrench shown and described in Letters Patent of the United States, No. 459,377, dated September 8, 1891, and issued to me.

My invention consists of the novel construction and combination of the several 25 parts, as hereinafter described, and specifically set forth in the claims.

In the drawings, A represents the long handle of my improved pipe-wrench and is hand-operated. It has the bent portion B, 30 which is made with a transverse mortise, as indicated by the dotted lines *b b* in Fig. 1 and shown in elevation at *b* in Figs. 3 and 4. The handle A terminates beyond the bent portion B thereof in a jaw C, said parts A, B, and 35 C being integral. On account of the mortise *b* the portion B is wider than the handle A, as seen in Figs. 2, 3, and 4. A circular hole extends through the bent portion B of the handle, as best shown at D in Fig. 4.

40 The outer edge of the jaw C has the concave seat E, which is provided with transverse beveled teeth or serrations, and it also has a smooth convex portion F and a small concave seat G, with transverse beveled 45 teeth or serrations.

The other handle H of this wrench is spring-operated, as hereinafter described. It has a straight portion of sufficient thickness to fit slidably in the mortise *b b* of the portion B of the handle A and is made with two 50 shoulders I. The handle H terminates in a hook-shaped jaw J, whose inner edge is concave and formed on a long curve and provided with transverse beveled teeth or serrations, as seen at K. The jaw J is of the same

thickness as the portion B of the handle A, as seen in Figs. 3 and 4.

Circular holes L extend through the handle H in series, preferably equally spaced apart, and are of the same size as the holes D 60 of the portion B of the handle A. Each of said holes L is capable of registering with said holes D and to be continuous therewith. A shallow groove M on one side of the handle H extends between the holes L throughout 65 the series thereof.

The pin N, which serves for a hinge-pin or fulcrum-pivot of my improved wrench, has a cylindrical stem of a diameter to fit slidably in the said holes. The hinge-pin N has a 70 head O, preferably knurled, and at the opposite end it has the concentric small projection or guide P. The pin N has two slots Q R, one extending longitudinally and having a closed end and the other extending circum- 75 ferentially nearly half-way around the pin and having a closed end; but the two slots are continuous, opening one into the other at a right angle, as shown in Figs. 3 and 4. A locking-pin S extends through the portion B 80 of the handle A at a right angle to the hinge-pin N, and the end of the pin S extends loosely into the slot, so that the hinge-pin N can be moved into either position shown in Figs. 3 or 4 or at any intermediate point 85 within the slots Q R.

Two springs T and U are fastened by the screws V V to the outer edge of the jaw C. The inner spring T has at its free end a flanged 90 head W, which slidably engages the contiguous edge of the handle H. The outer spring U is longer than the spring T and has a flanged head Y, which slidably engages the contiguous edge of the handle H.

The operation and advantages of this im- 95 proved construction are as follows: The two members of the wrench are pivotally connected, as illustrated in Figs. 1 and 3. When in the relation shown in Fig. 1, the jaws C J are capable of an angular opening to a certain 100 extent. If it is desired to change the extent of said angular opening, it is necessary to remove the hinge-pin N from that hole L of the handle H in which it is mounted and to insert said pin N in some other of the holes L. 105 To accomplish this, the operator seizes the knurled head O of the hinge-pin N and slightly turns it, so that the locking-pin S does not engage the hinge-pin N in the slot R thereof, as in Fig. 3, but in the longitudinal slot Q 110



thereof. He then draws out the hinge-pin N to the position shown in Fig. 4, the slot Q allowing such movement of the hinge-pin N along the locking-pin S. By this longitudinal movement the hinge-pin N is withdrawn from the hole D of the portion B of the handle A (represented in Fig. 4) and also from that hole L of the handle H in which it was formerly mounted. When the parts are thus brought into the position illustrated in Fig. 4, the handle H is movable longitudinally in either direction through the mortise *b b* of the portion B of the handle A. The handle H is thus moved until that one of the holes L of the handle A which is selected registers with the hole D of the handle A, whereupon the hinge-pin N is pushed inwardly and passes through said selected hole into and through said hole D. The head O is then turned, and the slot R of the hinge-pin N then receives the locking-pin S, as is seen in Fig. 3. The wrench is then in operative condition, having the jaws C J with such angular capacity as is desired, the handle H being normally pressed by the spring U to bring it close to the handle A. This adjustment of the jaws C J one with the other and their operations are precisely the same as is shown and described in my said Letters Patent No. 459,377. My present improvement thereon consists of the following additional features: The handle H has on one side the shallow groove M, which extends between the holes L, and the hinge-pin N has the projection P at its end, which fits loosely in said groove. The projection P serves as a guide, and the groove M serves as a guide-slot in the longitudinal movement of the handle H above described, whereas in the construction shown and described in my said Letters Patent it was necessary carefully to bring by hand the holes of both members of the wrench in alinement, so that they exactly register one with the others before the hinge-pin could be inserted through said holes. It is now only necessary for the operator to press gently with one hand upon the head O of the hinge-pin N while he is sliding with his other hand the handle H along the mortise *b b* of the other handle, and by this pressure upon the head O the guide P within the guide-slot M enters and centers the hinge-pin N in the hole L which he has selected, and the prior careful registration of the holes which heretofore has been necessary is dispensed with. The mainspring U has the function normally to press the jaws toward each other. The strain upon this spring, however, tends to weaken it, and it is by excessive strain liable to breakage. The spring T does not impair the action or utility of the spring U, but as its flanged head W is nearer the fulcrum or pivot of the wrench its head W soon comes into forcible contact with the handle H and begins to slide along said handle and then the spring T begins to bend

and to come under tension, thus serving the purpose of increasing the spring-pressure upon the jaw C to insure a more forcible bite upon the pipe, which is held by the wrench, and especially to take some of the total spring-pressure upon itself and to that extent to relieve the spring U, and thus to save the spring U from breakage or undue strain, which would impair its tension after repeated use. The jaw C has the three working surfaces shown in the drawings—the large concave surface E, the small concave surface G, and the intermediate convex surface F—and the jaw J has the long concave surface K and the straight surface F'. The portion F of the jaw C and the portion F' of the jaw J are smooth, thus allowing the implement when properly adjusted to seize and hold an article without liability to mar the same.

In the drawings is represented a pipe Z, held by the concave edge K of the jaw J on one side and the concave edge E of the jaw C on the opposite side. The diameter of the pipe Z is indicated by the dotted line *a a*. By an examination of Fig. 1 it is seen that the bite of the teeth of the jaw C upon the pipe Z (to turn said pipe in the direction of the arrow *z*) is at and near the point *m*. Hence the force of the jaw C upon the pipe Z when the handle A closes to the handle H is exerted not diametrically of the pipe Z, but tangentially thereto and at a point out of said diametrical line *a a* and somewhat remote therefrom, whereas in the use of the wrench shown and described in my said Letters Patent the convex end on its spring-pressed jaw exerts its force in a direction in line with the diameter of the pipe. This is an important matter especially in coupling and uncoupling old and rusty pipes, which by reason of exposure to dampness, as when lying underground, are weak and liable to be broken. With the use of my former wrench the pipe is seized by a crushing pressure directly radially inward; but when the wrench herein described is used the pipe is seized and moved tangentially, in which case the pipe, though rusty, may safely be screwed or unscrewed.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. The improved pipe-wrench herein described, consisting of an integral handle and jaw with an intermediate bend which is provided with a mortise and with two opposite holes in alinement and extending into said mortise, a second integral handle and jaw, which second-named handle is movably longitudinally in said mortise and is provided with a series of holes in alinement with each other, each of which holes is registrable with the first-named holes and is of the same diameter as the first-named holes, said second-named handle being channeled on one side between the holes thereof, a hinge-pin having a head and longitudinal slot closed at one



end and a slot opening into the first-named slot at a right angle and having a closed end, a guide or projection at the end of the hinge-pin fitting loosely in said channel of the second-named handle which hinge-pin is adapted to be mounted in the holes of the first-named handle and in either of the holes of the second-named handle, and a locking-pin extending through the first-named handle to engage said hinge-pin in the slots thereof so as to limit the movements of said hinge-pin.

2. In a pipe-wrench, the combination of two handles, one of which is provided with a mortise and two holes in alinement opening into said mortise on opposite sides thereof, and the other of which handles is longitudinally grooved on one side to form a guide-slot and has a series of holes in alinement with said slot, and is longitudinally movable in said mortise, and a hinge-pin adapted to be mounted in said first-mentioned holes of the one handle and at the same time in either of the holes in the second-named handle and having a guide at its end which extends into said guide-slot.

3. In a pipe-wrench, the combination of a

manually-operated handle having a mortise, and diametrically opposite pivot-holes opening into said mortise, and provided at one end with a jaw which has a concave inner edge with transverse teeth, a slidable jaw mounted in said mortise and having a plurality of pivot-holes in line, each of which is registrable at will with the two pivot-holes of the first-named handle, a fulcrum-pin adapted to connect pivotally said two handles and passing through the two pivot-holes of the first-named handle and either selected pivot-hole of the second-named handle, a spring fastened at one end on the first-named handle and having its free end in operative contact with one end of the second-named handle, and a jaw on the opposite end of the second-named handle adapted to cooperate with the first-named jaw and provided with a concave inner edge having transverse teeth.

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

JAMES G. LIND.

Witnesses:

WARREN R. PERCE,  
ANNIE E. PERCE.