

(No Model.)

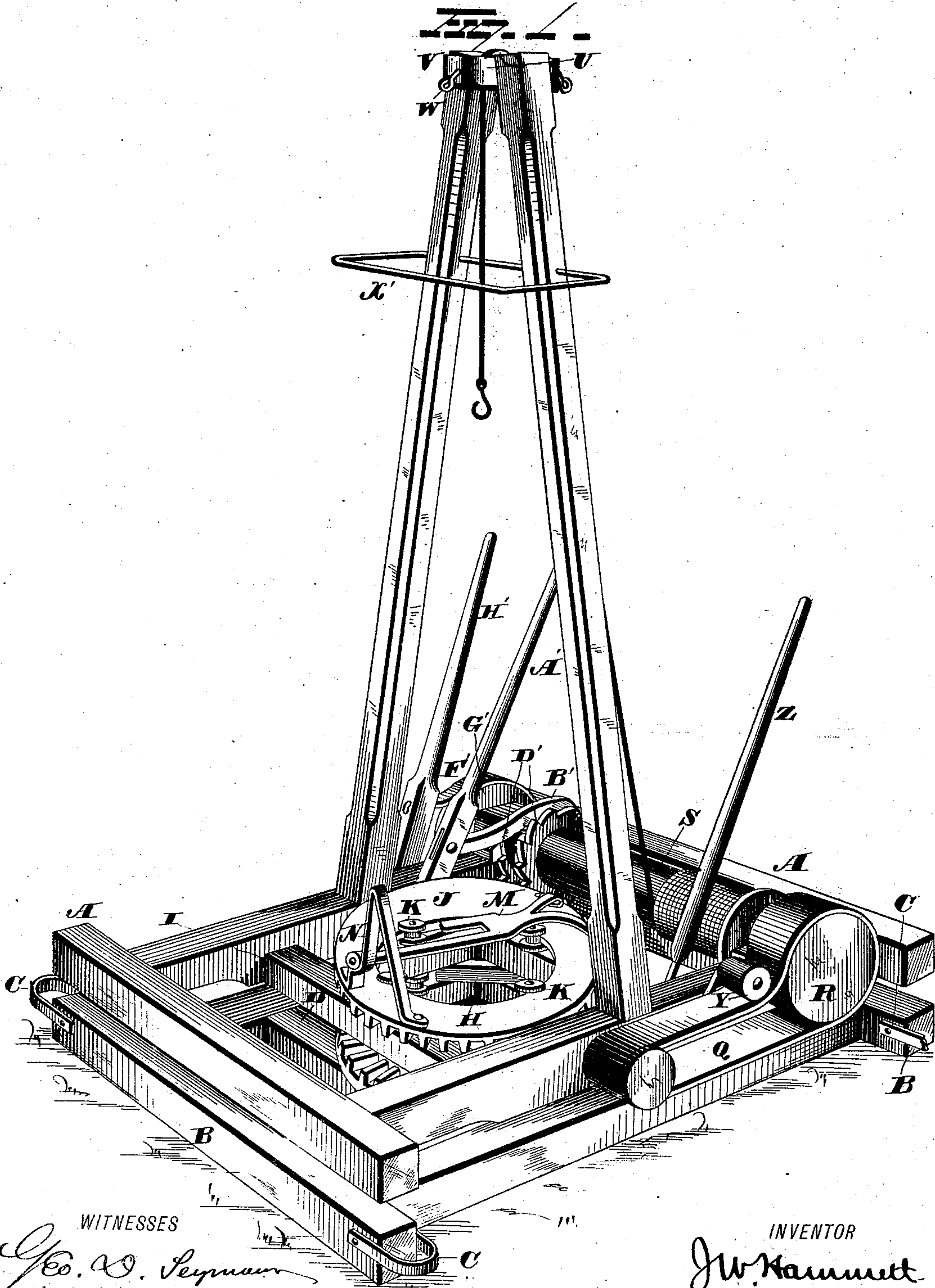
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J. W. HAMMETT.

APPARATUS FOR BORING WELLS.

No. 292,485.

Patented Jan. 29, 1884.



WITNESSES

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(No Model.)

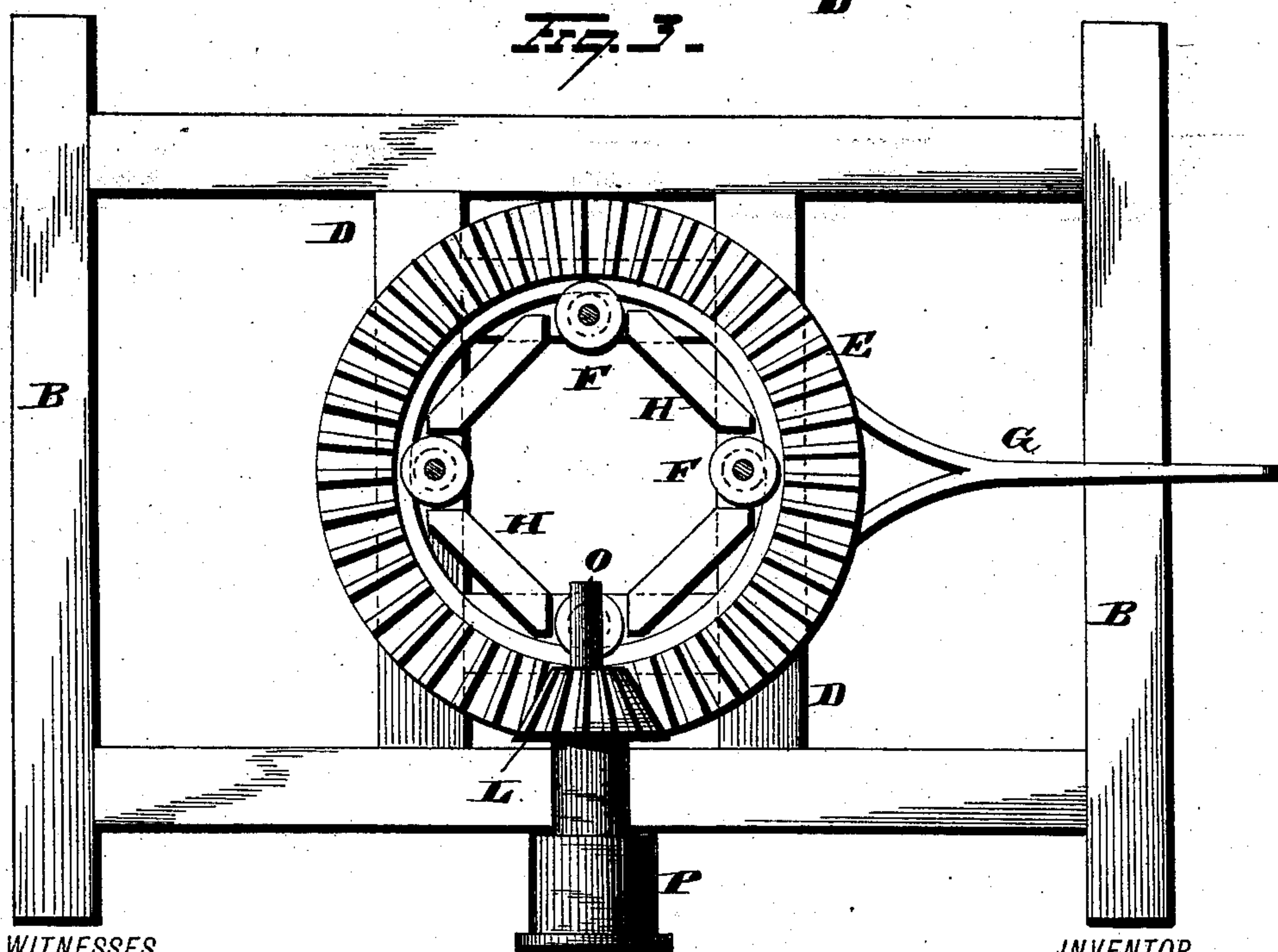
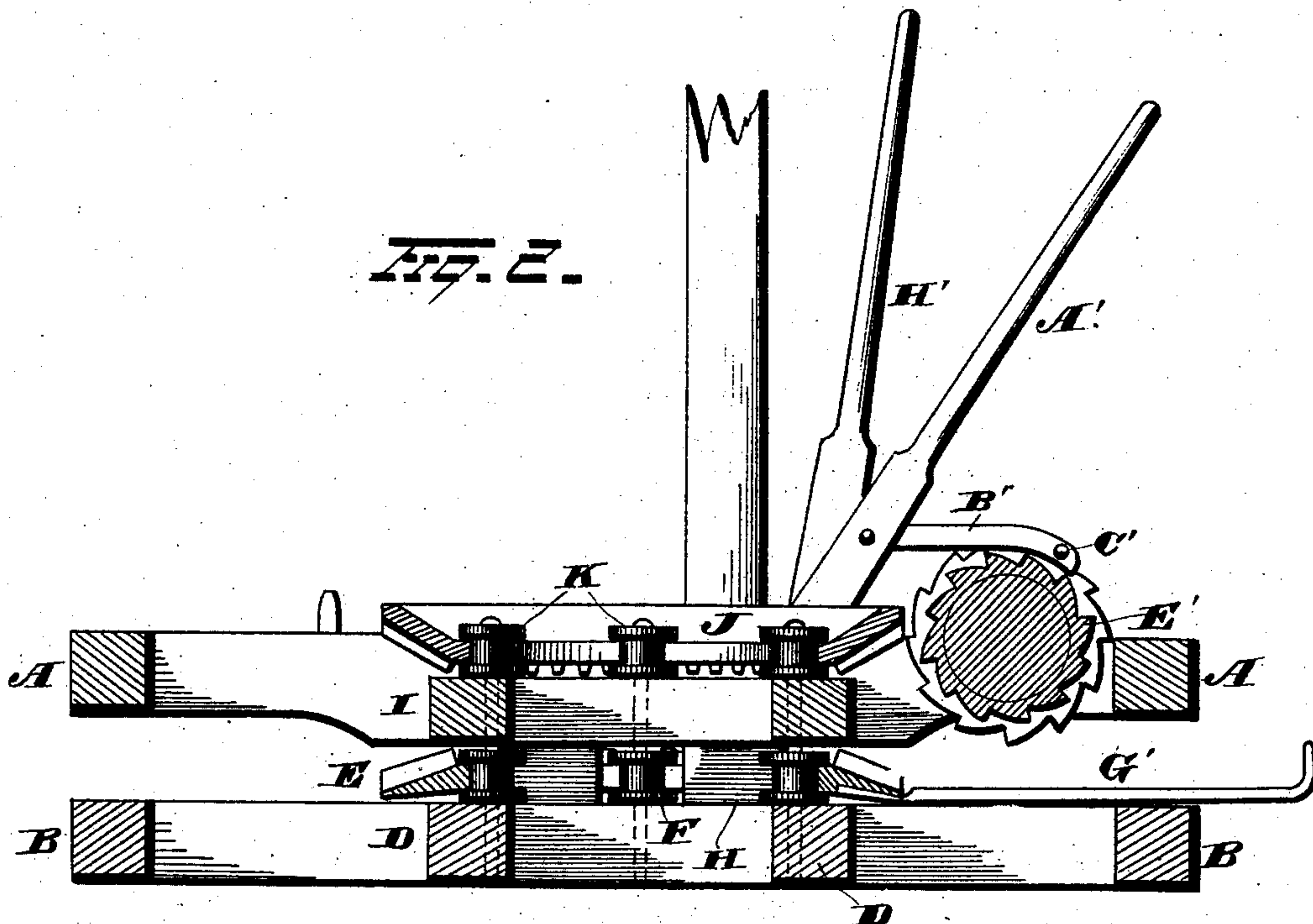
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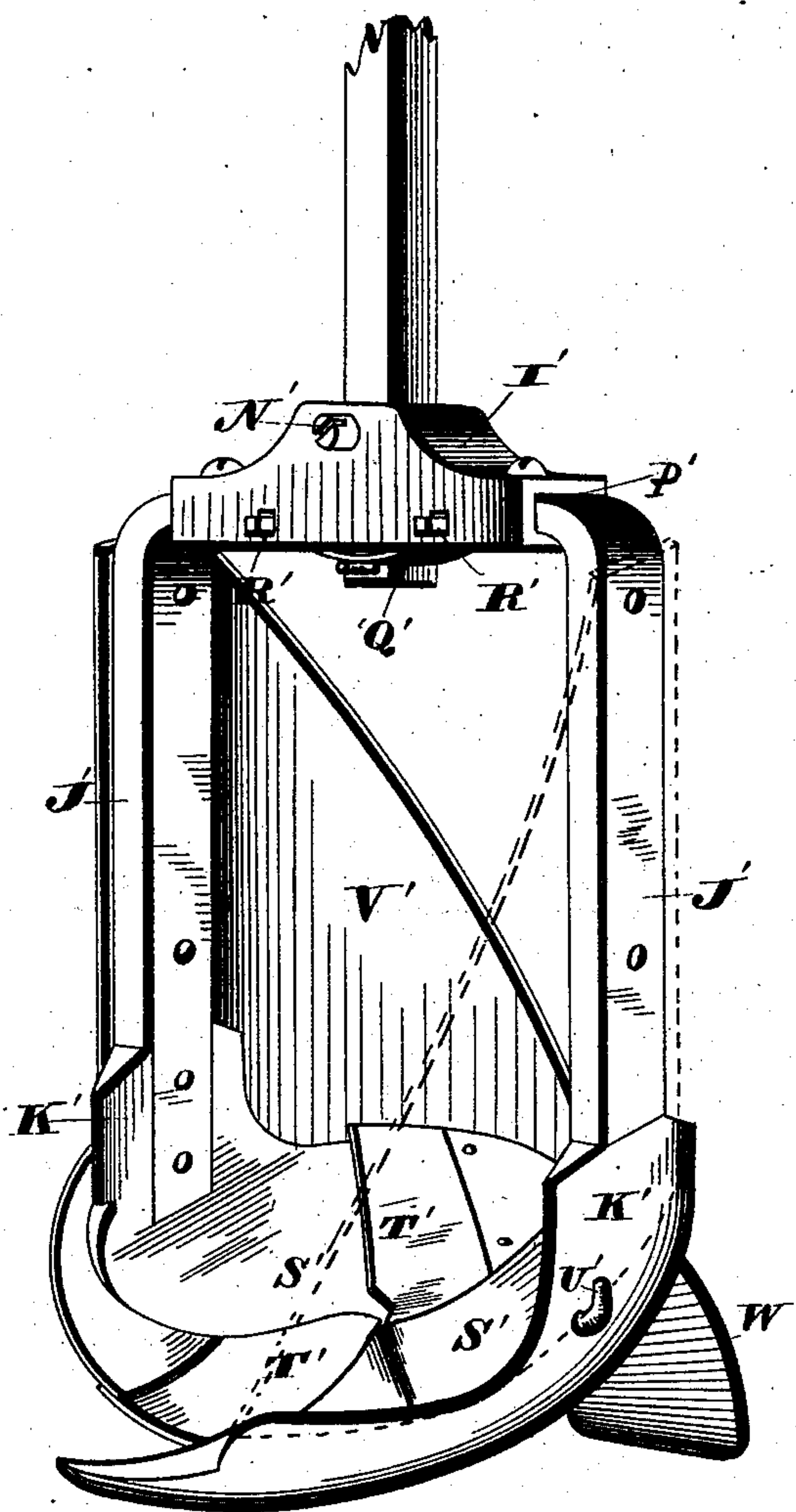


FIG. 4.

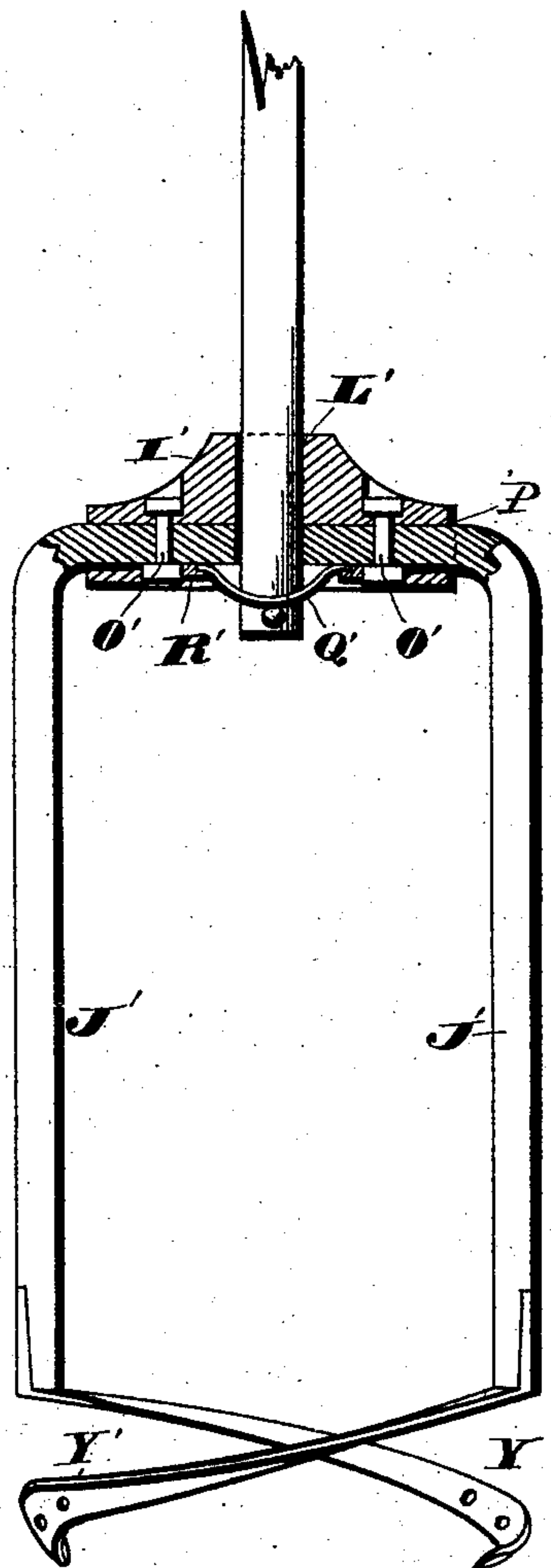


FIG. 5.

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Fig. 6.

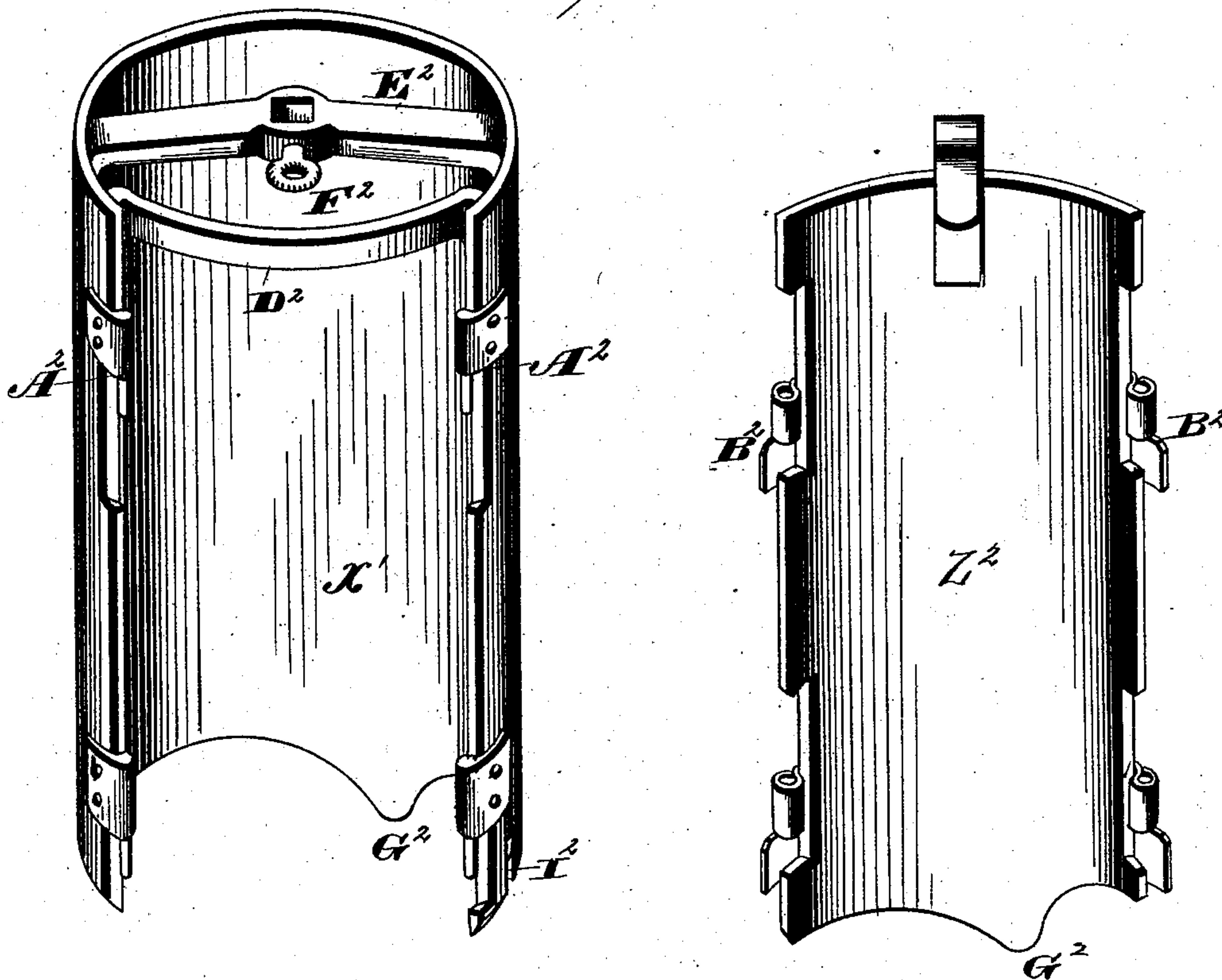
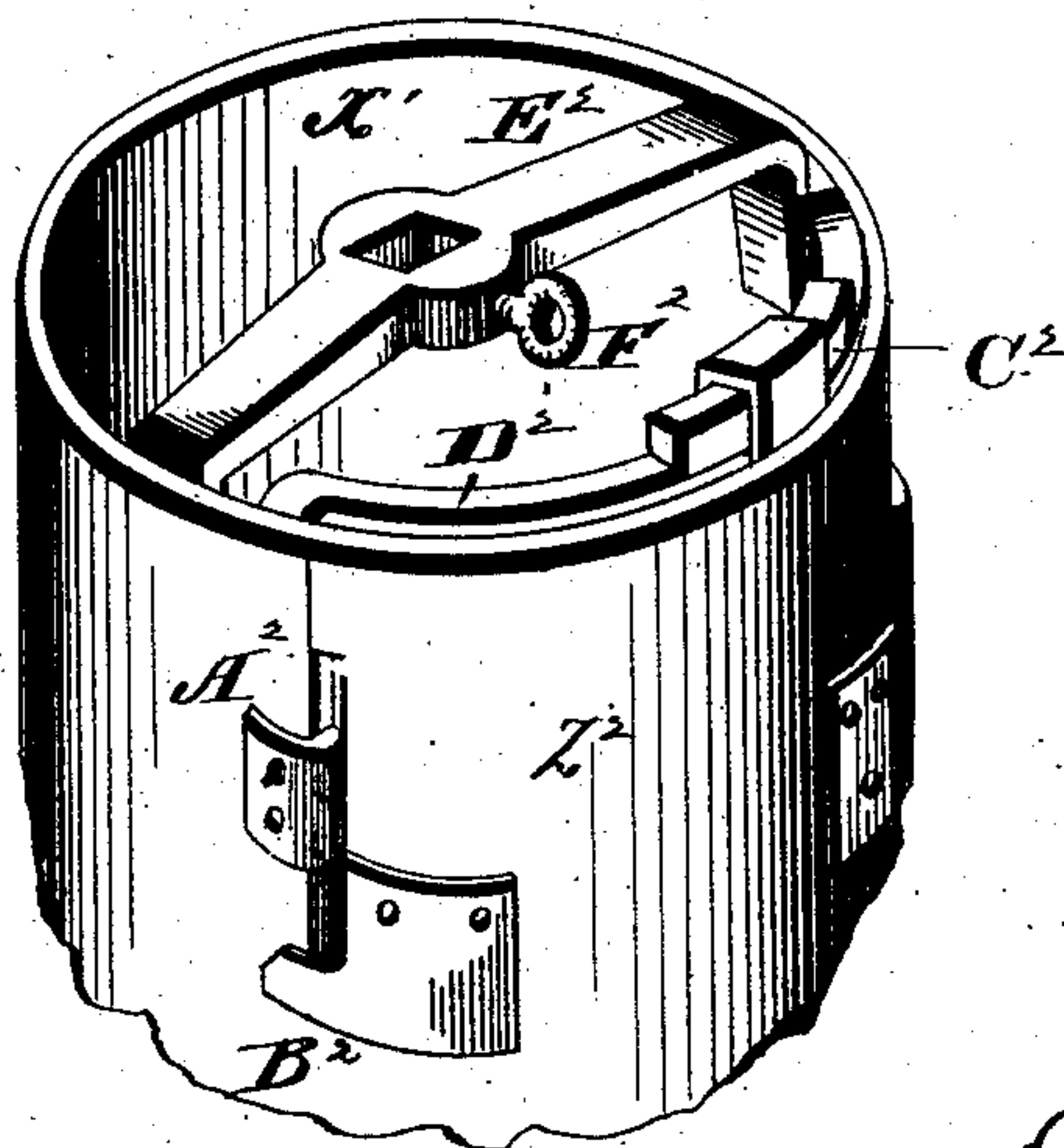


Fig. 7.



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Fig. 8

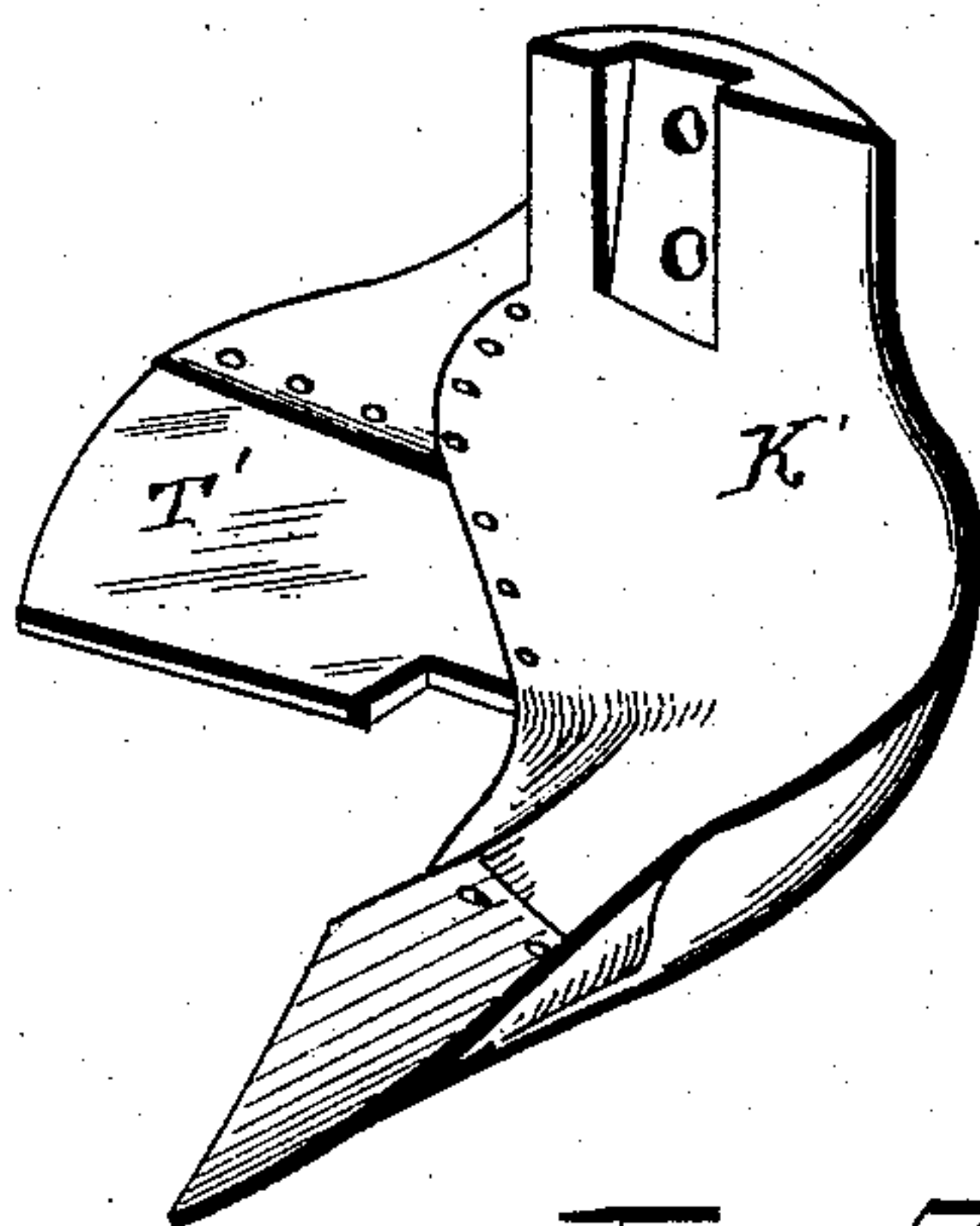
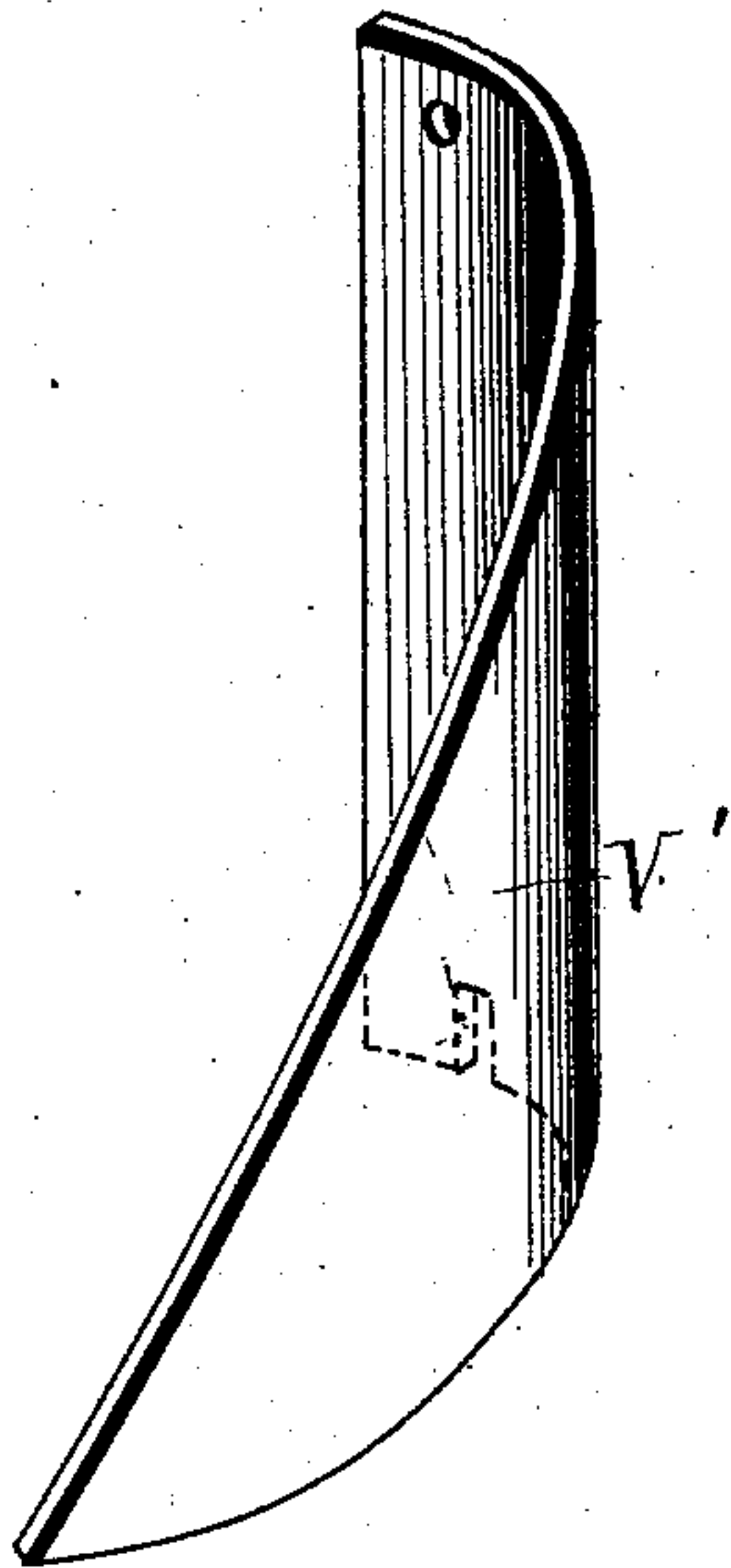


Fig. 9



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UNITED STATES PATENT OFFICE.

JAMES W. HAMMETT, OF GRANT, WEST VIRGINIA.

APPARATUS FOR BORING WELLS.

SPECIFICATION forming part of Letters Patent No. 292,485, dated January 29, 1884.

Application filed November 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. HAMMETT, of Grant, in the county of Pleasants and State of West Virginia, have invented certain new and useful Improvements in Apparatus for Boring Wells; 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 pertains to make and use the same.

My invention relates to an improvement in boring apparatus, the object being to produce apparatus of this character which shall combine simplicity and cheapness of construction with ease of operation and durability and efficiency in use.

With these objects in view my invention consists in certain details of construction and combinations of parts, as will be hereinafter explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of the power-frame and derrick and the devices associated with them. Fig. 2 is a view, in vertical longitudinal section, through the power-frame. Fig. 3 is a plan view of the lower part of the said frame. Fig. 4 is a view in perspective of the auger. Fig. 5 shows the adaptation of the auger to the removal of obstructions from the bore. Fig. 6 is a view in perspective of the shell, the door thereof being detached and shown in rear perspective. Fig. 7 is a view in perspective of the upper end of the shell, the door thereof being represented in its locked adjustment. Fig. 8 is a detached perspective view of one of the cutters of the auger, showing also the extension and valve, and Fig. 9 is a detached perspective view of one of the removable wings.

The power-frame, upon which the device is mounted and which embodies the device for utilizing horse-power in a novel manner, is double in its structure. It consists of an upper frame, A, mounted upon a frame, B, of similar shape, and having its end beams provided with stirrups C, by means of which the whole apparatus is stayed to the earth. A structure, D, located near the center of the said frame A, forms a bearing for an annular face-wheel, E, which is held in place and guided in its movements by four rollers, F, mounted, respectively, on the four sections of

the structure D, the said wheel being provided with a sweep, G, with which the horse describes a circle around the power-frame. The frame A is secured to and supported above the frame B by blocks H, which are attached to the structure D, and upon which the structure I of the frame A rests. A face-wheel, J, mounted in inverted position upon the structure I, and held in place by rollers K, secured thereto, is rotated by power derived from the face-wheel E through the bevel-pinion L, journaled in the frame A and the structure D thereof. The said wheel J is provided with a pivotal and removable auger-clamp, M, the free end of which is supported by a rack, N, also mounted upon the face of the said wheel. The outer end of the shaft O of the bevel-pinion L is provided with a pulley, P, encircled by a belt, Q, also encircling the pulley R of the drum S, upon which the drill-rope is wound. The said rope runs over a sheave, U, which is located in an oval metallic box, V, mounted in the top of the derrick, and provided with hooks W, for the attachment of guy-ropes. The derrick is also provided with a frame, X, which is designed to support the upper sections of the shafting when uncoupled from the lower sections thereof. Normally, the belt Q is not sufficiently tight to transmit the motion of the pulley P to the pulley R of the drum S, it being necessary, when it is desired to actuate said drum, to apply the stress-pulley Y, which is operated by the hand-lever Z. Under this arrangement the drum, and hence the devices attached to the rope wound on it, are entirely under the control of the operator, who has it in his power to apply the stress-pulley to actuate the drum for any desired time.

Independently of the belt Q, the drum may be actuated by the hand-lever A', which is provided with a pawl, B', having a pin, C', attached to its outer end, said pin being adapted to be engaged with two ratchets, D'. By engaging the pin C' of the pawl with the ratchets, and elevating the hand-lever A', the drum S will be revolved, being at the same time locked from turning in an opposite direction by the gravity action of the pawl. In case it should be necessary to reverse the direction of the drum's rotation, reversely-acting devices for manually actuating it will be necessary. These are furnished in the ratchet E', interposed be-

tween the ratchets D' and the pawls B', above described, the pin C' being withdrawn therefrom, to permit the end of the pawl to fall between the ratchets D', and engage with the ratchet E'. In this case, also, the gravity action of the pawl prevents the drum from rotating reversely and uncoiling the drill-rope. The action of the drum is further controlled by the friction-band F', which encircles the pulley G', said band being attached to the hand-lever H'.

The auger is composed of the head I', the depending arms J', and the cutters K'. The said head is provided with a central perforation, L', to receive the lower section, M', of the shafting, which is held in place by the set-screw N'. The opposite ends of the head are provided with openings P', adapted to receive the curved upper ends of the arms J', which are removably secured to the head by bolts O'. The openings P', formed in the ends of the auger-head, as aforesaid, are sufficiently large, so that when the nuts of the bolts O' are loosened, the curved upper ends of the arms J' will be given a slight range of movement, whereby the lower ends of the arms may be moved toward or from each other, as will be hereinafter described. A spring, Q', arranged to impinge on the lower faces of ends of the said arms, and held in place by keys R', is centrally perforated, to receive the lower end of the section M' of the shafting; and of the function of this spring hereinafter.

The cutters K, which are slightly curved in general contour, are formed with convex outer and concave inner faces. They are provided with extensions S', with valves T', and with hooks U', the latter being adapted to engage with the lower edges of the wings V', which are removably secured to the outer faces of the cutters and to the arms J'. The cutters are also provided with auxiliary edges or points W', which, as well as the wings V', are removed when the auger is used in conjunction with the shell X'; and it may be here remarked that the valves T' are necessary only when the auger is used in conjunction with the shell aforesaid. The object in removably securing the cutters K' to the arms J' is to permit them to be removed and replaced by the spiral lifters Y'. This is done when boulders or other obstructions are encountered, the said lifters being especially adapted in form to grasp such obstructions, and facilitate their removal from the bore. In connection with this function, it is desirable to impart a certain degree of flexibility to the arms J', and this is obtained through the agency of the spring Q', which is brought into play by unscrewing the set-screw N', and by depressing the section M' of the shafting. The nuts of the bolts O' are now unscrewed, with the effect of loosening the adjustment of the arms, the lower ends of which will be deflected toward each other by the spring Q'. When, now, the lifters Y' meet with obstructions of a hard and unyielding nature, they will, in virtue of

their flexible adjustment, separate and accommodate themselves to the obstruction, thus avoiding injury to the auger. As soon as the lifters are relieved of this influence, tending to separate them, they will at once be restored to their normal positions by the spring.

The cylindrical shell X' is designed especially to be used in conjunction with the auger in boring under water through strata of sand and gravel. The said shell is provided with a door, Z', through which the collected matter is withdrawn, and through which the auger is accessible for any repairs or attentions. The door aforesaid forms an independent section of the shell, to which it is secured by pins A', attached thereto, and adapted to fit within suitable sleeves, B', attached to the door, the pins and sleeves being engaged or disengaged with or from each other by sliding the door longitudinally. The door is secured in position by means of a key, C', which is interposed between a hook attached to the upper end of the door and the rod D', which is engaged by said hook. The open upper end of the shell is provided with a bail, E', centrally perforated to receive the shafting, and having a set-screw, F', to engage with the same. Instead of removing the door to withdraw the matter collected in the shell, the screw F' may be loosened to let the auger drop sufficiently below the lower end of the shell to permit the voluntary discharge of the matter collected by it. The lower end of the shell is shaped to form two cutters, G', which disintegrate the formation at the bottom of the well, and in this aid the action of the auger, the cutters of which are held rigidly in place by the reception of their hooks U' within notches I', formed in the lower edge of the shell.

It is evident that numerous slight changes in the construction of the several parts might be resorted to without departing from the spirit of my invention, and hence I would have it understood that I do not confine myself to the exact construction shown and described, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

What I claim is—

1. In a boring apparatus, the combination, with a frame, and an annular face-wheel which has bearing upon it, of a frame supported above the frame aforesaid by a structure rising within said face-wheel, an annular face-wheel mounted upon the upper frame, and a bevel-pinion meshing with both wheels, substantially as set forth.

2. In a boring apparatus, the combination, with a frame, an annular face-wheel, and a sweep attached to said wheel, of a frame supported above the frame aforesaid by a structure rising within said wheel, an annular face-wheel mounted upon the upper frame, a pinion meshing with both wheels and rollers, located within the wheels, substantially as set forth.

3. In a boring apparatus, the combination, with power mechanism, of a drum on which

the drill-cord is wound, a loose belt uniting the power mechanism and said drum, and a hand-operator stress-pulley to impart to the belt the tension required to actuate the drum, substantially as set forth.

4. In a boring apparatus, the combination, with power mechanism, of a drum on which the drill-cord is wound, three ratchets grouped together on said drum, the outer ratchets being cut oppositely from the ratchet between them, a hand-lever, and a gravity-pawl having a removable pin in its outer end and adapted to engage with said ratchets, substantially as set forth.

5. In a boring apparatus, an auger consisting in the combination, with a centrally-perforated auger-head having open ends, of two depending arms the curved upper ends of which are secured in the open ends of the auger-head, and cutters curved in general contour, having convex outer and concave inner faces provided with detachable extensions and valves, and adapted to be removably secured to the lower ends of said depending arms, substantially as set forth.

6. In a boring apparatus, the combination, with an auger-head, arms depending therefrom, and cutters removably secured to the lower ends of the arms, of wings detachably attached to the arms and the cutters, substantially as set forth.

7. In a boring apparatus, the combination, with an auger-head having open ends, of depending arms the upper ends of which are secured in the open ends of the said auger-head,

and a spring located in the auger-head, and arranged to impinge on the ends of the said arms, substantially as set forth.

8. In a boring apparatus, the combination, with an auger-head having open ends, of two depending arms the upper ends of which are secured in said head, of a spring located in the auger-head, and arranged to impinge on the ends of said arms, and spiral lifters detachably secured to the lower ends of the arms, substantially as set forth.

9. In a boring apparatus, the combination, with a shell having a bail and a rod attached to its upper end, of a removable door provided with a hook, to engage with the rod attached to the shell, and a key to be interposed between the hook and rod, to lock the door to the shell, the lower end of the door and shell being shaped to form cutters, substantially as set forth.

10. In a boring apparatus, the combination, with a shell having one side cut away, of pins mounted in bearings projecting beyond both edges of the cut-away portion of the shell, a door, and sleeves secured to the opposite edges thereof, and arranged to be engaged with the pins aforesaid by adjusting the door on the shell and sliding it longitudinally to its true position, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAS. W. HAMMETT.

Witnesses:

S. G. NOTTINGHAM,
GEO. COOK.