

(No Model.)

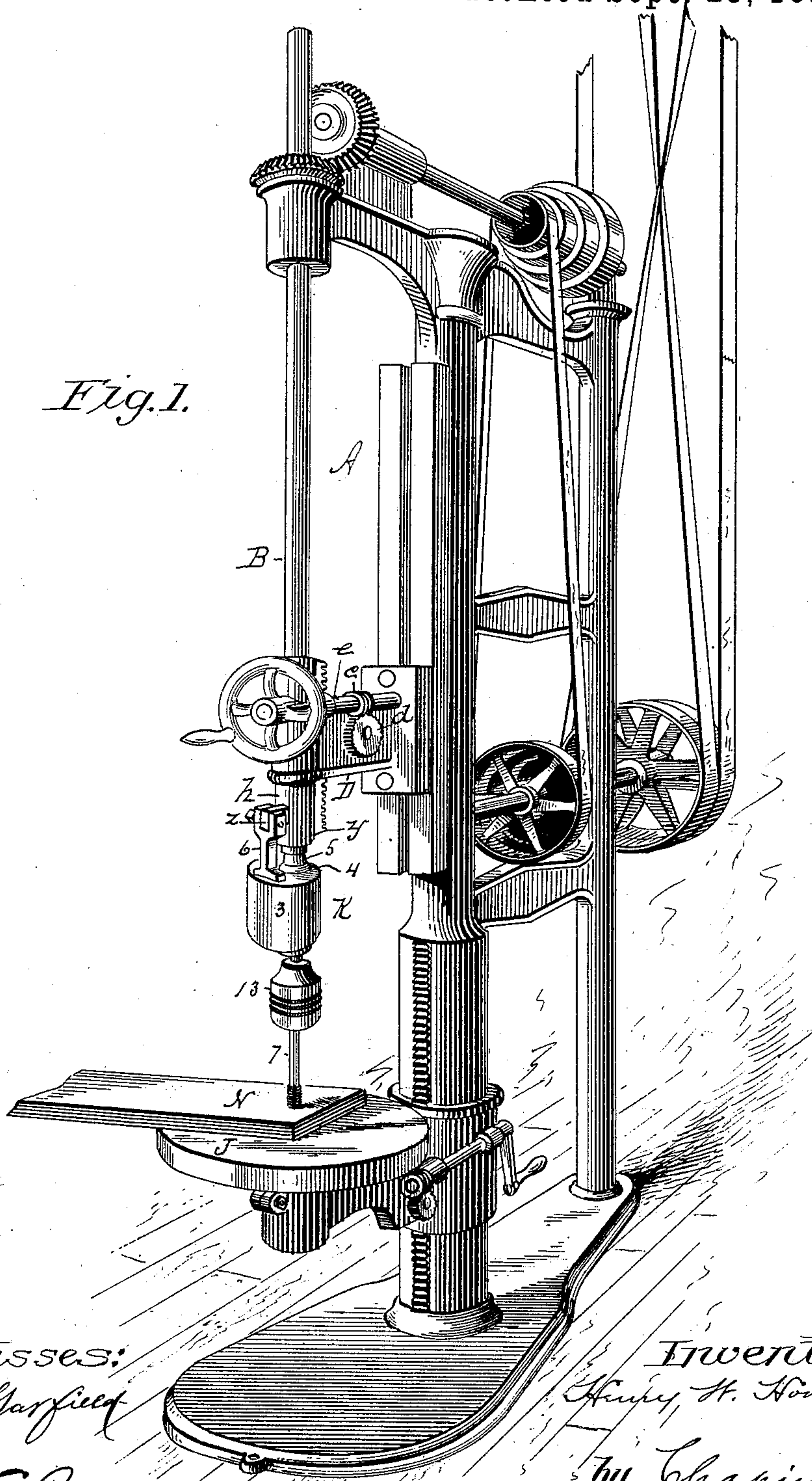
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H. W. HONEYMAN.
TAPPING MACHINE.

No. 437,157.

Patented Sept. 23, 1890.

Fig. 1.



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(No Model.)

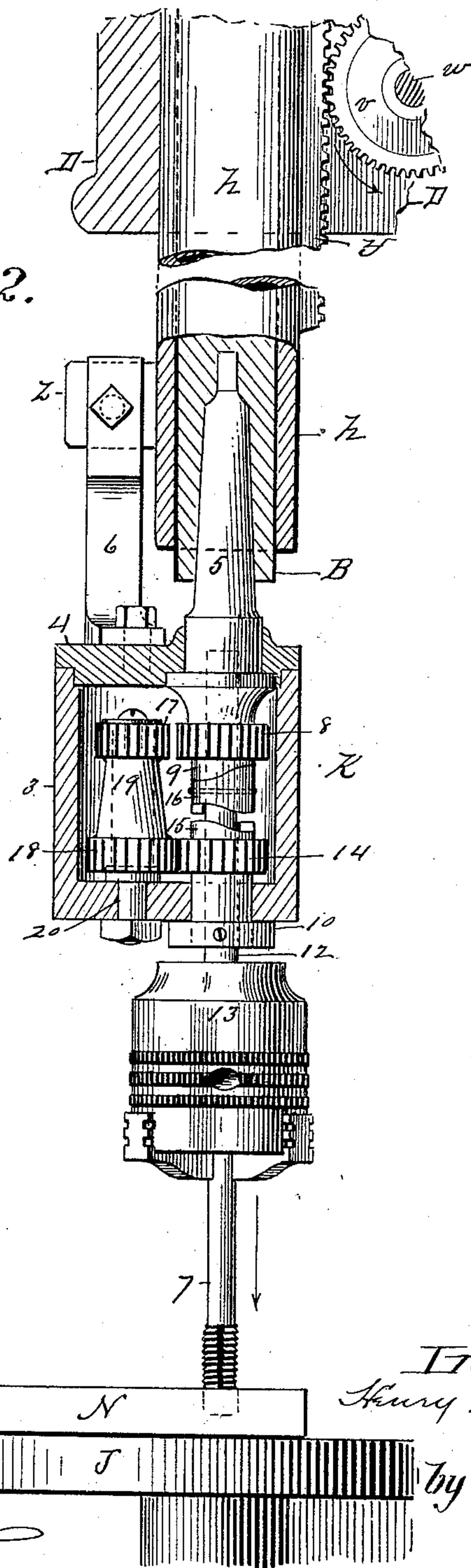
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Fig. 2.



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Fig. 4.

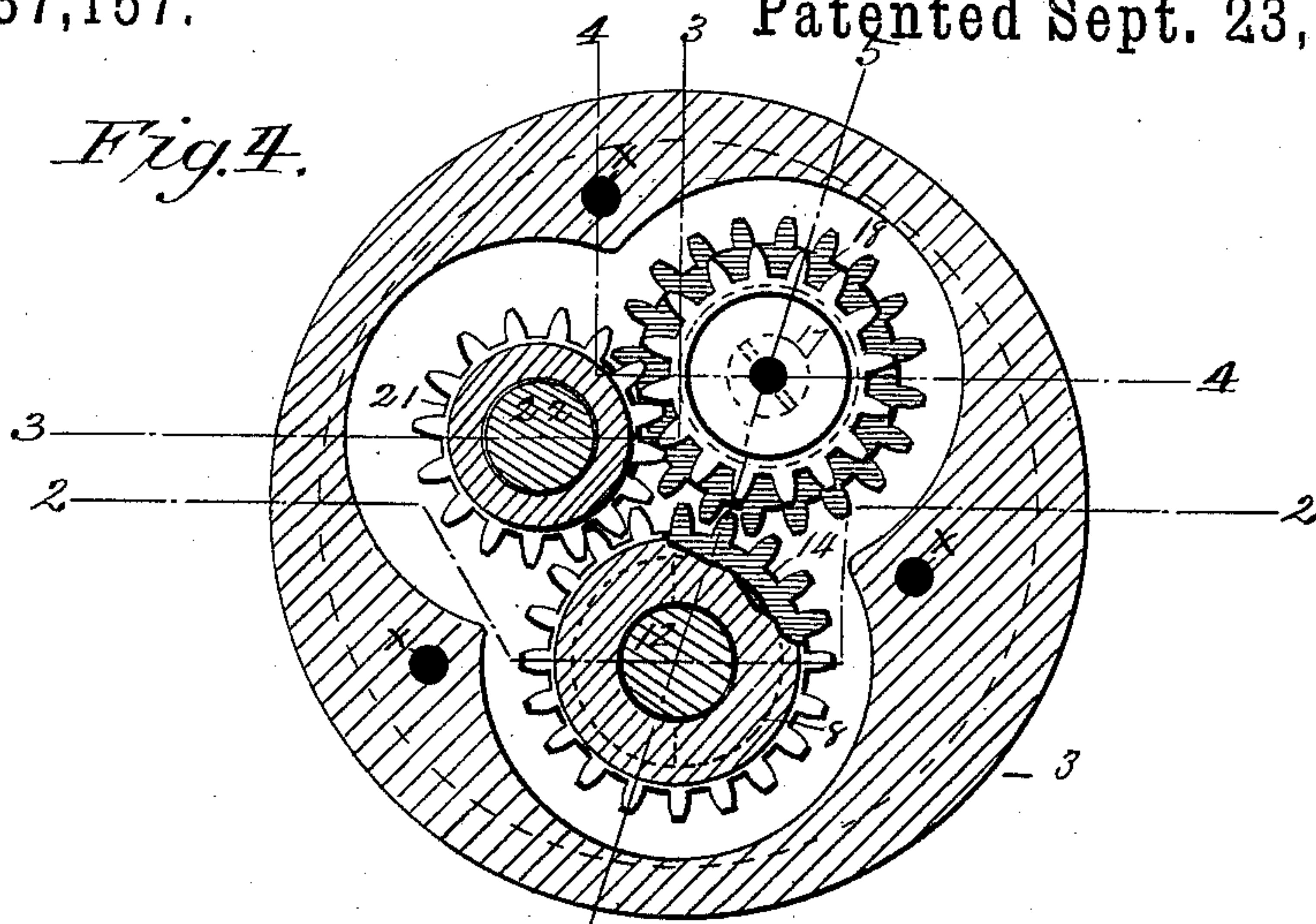


Fig. 3.

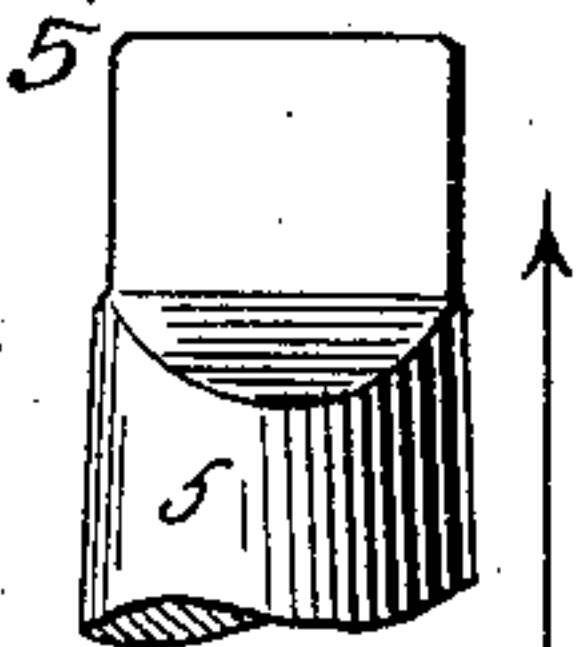


Fig. 5.

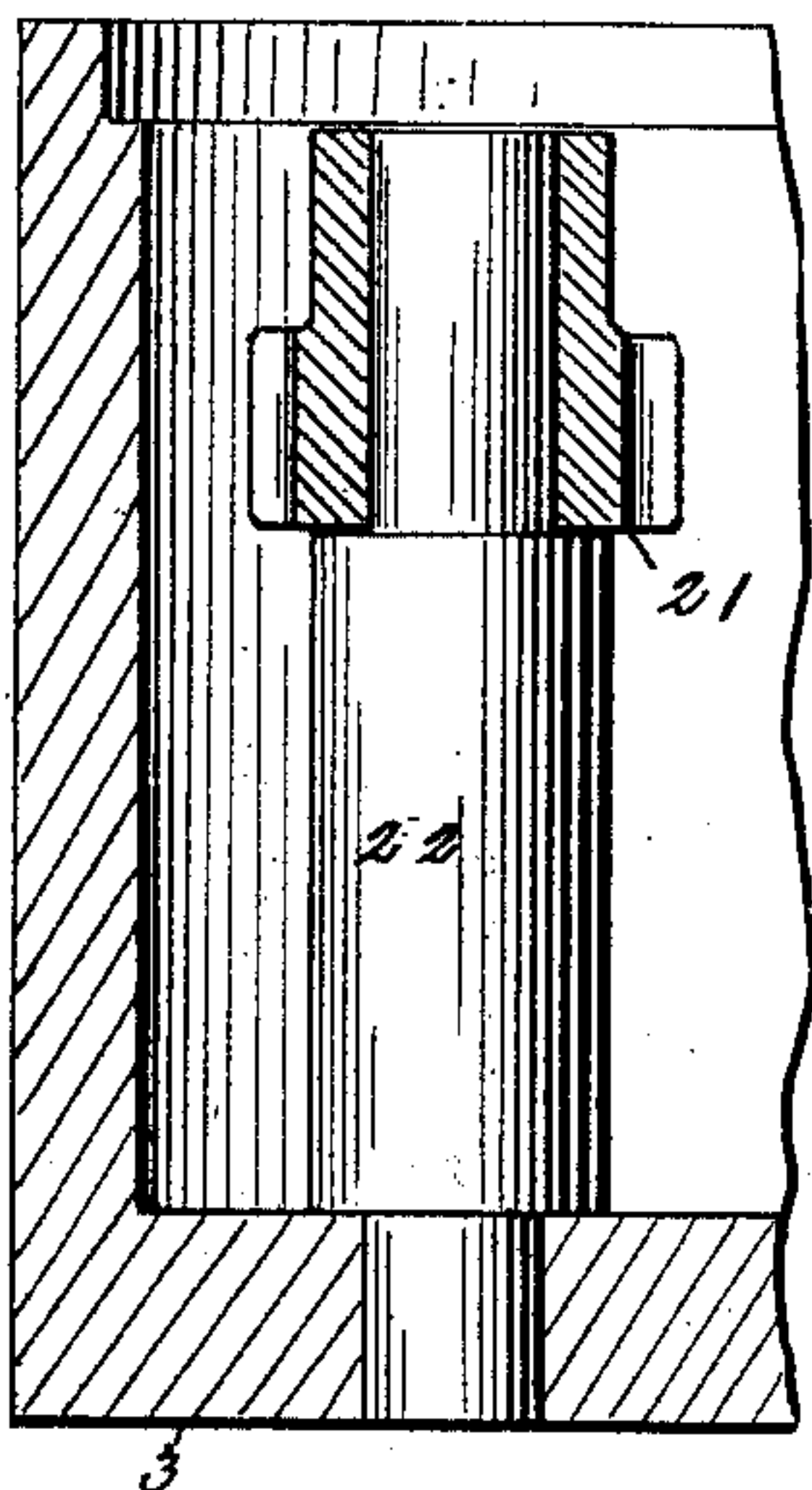
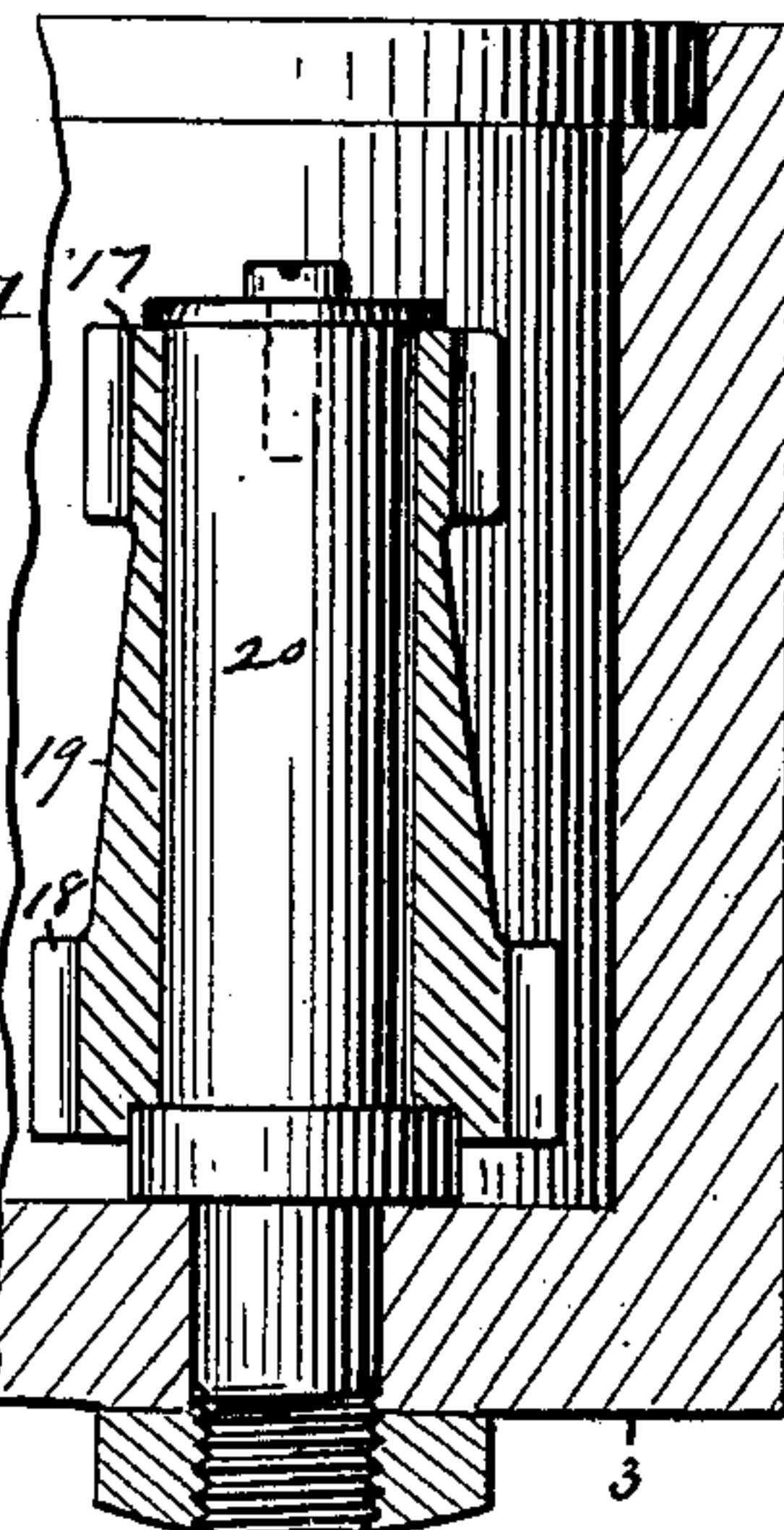


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 437,157, dated September 23, 1890.

Application filed January 23, 1890. Serial No. 337,881. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. HONEYMAN, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Tapping-Machines, of which the following is a specification.

This invention relates to tools for tapping metal, and refers to an improved implement adapted to be applied to an upright or other drilling-machine of ordinary construction for tapping bars, nuts, or other pieces of metal or other material; and the invention consists in the peculiar construction and operation of the several parts of the device, all as hereinafter fully described, and referred to in the claims.

In the drawings forming part of this specification, Figure 1 is a perspective view of an upright drill-press having applied thereto a tapping device embodying my invention. Fig. 2 is a sectional side elevation of portions of said drill-press (below described) and a side elevation, partly in section, of said tapping device, and of a tap-chuck connected thereto. Fig. 3 is a vertical section of the case of the tapping device and a side elevation of its internal mechanism and projecting spindles, a portion of said tap-holding chuck being there shown. Fig. 4 is a transverse section on the line 1 1, Fig. 3. Fig. 5 is a vertical sectional view on the line 3 3, Fig. 4. Fig. 6 is a vertical sectional view on line 4 4, Fig. 4. Line 5 5, Fig. 4, indicates the section of the device shown in Fig. 2.

In the drawings, A, Fig. 1, indicates an upright drilling-machine of ordinary construction, this being one of the many machines on which the tapping device herein shown and described is adapted to be used, said device being also applicable to lathes and drilling-machines having horizontal spindles.

In Figs. 1 and 2, B indicates the drill-spindle; D, the lower spindle-supporting bracket; h, the rack-sleeve inclosing the spindle B and having the usual vertical feeding movement with said spindle toward and from the table J of the machine, said vertical movement being imparted to the sleeve h and the spindle by means of the usual hand-wheel e, having a

worm c thereon, which engages with a worm-gear d on a shaft w in bracket D, on which is a pinion v, (see Fig. 2,) said pinion engaging with the rack y, as shown. Thus by turning shaft e the sleeve h and the spindle B are moved toward or from the table J to carry any tool held by spindle B against or from any work there may be on said table, in a manner well known to machinists and others familiar with such machines.

Rotary motion is given to spindle B by belts and shafts, as shown in Fig. 1, as usual in the drilling-machine there shown; but only one belt is brought into use when the within-described tapping device is used.

The tapping device K is provided with a case 3, of cylindrical form preferably, and made, by preference, of cup shape, as shown, and having a removable cover 4, which is secured thereon by suitable bolts, Fig. 4, showing at x the holes therefor. On said cover 4 is secured a post 6, the upper end of which is attached to an arm or lateral projection z on said sleeve h, as shown, said post forming such a rigid connection between the case 3 and said sleeve as prevents the rotation of said case when the spindle 5 is turned by its engagement with the spindle B, as shown in Fig. 2. Any other suitable connection than said post 6 may be adopted for the purpose specified, and said post may engage with the rack y or any other suitable part of the machine. A spindle 5 has a suitable bearing in said cover 4 of the case 3, in which it rotates, the outer end of said spindle being tapered and fitted to the usual tool-socket in the lower end of the drill-spindle B, whereby the spindle 5 is made to rotate with the drill-spindle B. The latter and the spindle 5 in the operation of tapping or running the tap (which is operated by the device) in or out of a hole to be screw-threaded rotate in one and the same direction—that is, to the right—as provided for in the device herein shown. The lower end of the spindle 5 within the case 3 has fixed thereon a pinion 8, on the under side of which is formed or secured thereto a clutch-section 9, and the said lower end of the spindle 5 is perforated longitudinally for a certain distance, as indicated by

dotted lines in Figs. 2 and 3. In the bottom of said case 3 is secured a box 10, which constitutes a bearing for a spindle 12, whose lower end projects far enough below said bottom to allow of properly attaching an ordinary screw-chuck 13 thereto, said chuck serving to hold said tap 7, as shown. The said spindle 12 has thereon inside of case 3 a pinion 14, through which it passes loosely, said pinion having on its upper side a clutch-section 15, which is formed or secured thereon, and the upper end of said spindle 12 extends centrally through said clutch-section 9 and pinion 8 into said socket-perforation in the lower end of spindle 5, as indicated in Fig. 3, this spindle 12 in operation having a reciprocating movement in the socket of spindle 5, as below described. Said spindle 12 has fixed thereon between said clutch-sections 9 and 15 (by pinning or other suitable means) a clutch 16, which, through said reciprocating vertical movements of the spindle 12, is alternately engaged first with one and then with the other of said clutch-sections. The spindle 5 is the driving-spindle of the device, and the spindle 12 is the driven tool-carrying spindle thereof. Two pinions 17 and 18 intermediate of the said pinions 8 and 14 are fixed on a single barrel 19, and pinion 18 has an engagement with pinion 14 on spindle 12. The said pinion-bearing barrel 19 and its pinions rotate on a post 20, secured to the bottom of case 3. (See Figs. 2 and 6.) A third intermediate pinion 21 rotates on a post 22, fixed also to the bottom of case 3, said pinion 21 engaging with said pinion 8 and with said pinion 17, as shown in Fig. 4.

Thus by means of the system of gearing above described, and illustrated in Figs. 2 to 6, the pinion 14 and its clutch-section 15 are given a rotary motion derived from the spindle 5 contrary to that of the last-named spindle, or to the left. The pinion 8 and its clutch-section, being fixed on spindle 5, both rotate to the right therewith.

As above stated, the clutch 16 on the vertically longitudinally-moving spindle 12 is located between said clutch-sections 9 and 15 and is adapted to be engaged with either one of them, whereby a right or left hand rotary movement is imparted to the spindle 12 and to the tap 7 attached thereto.

The operation of the within-described improvements in tapping is as follows, assuming that the clutch parts of the tapping device occupy the positions illustrated in Fig. 3: A piece or bar of metal N, having a hole therein to be tapped, is placed under the tap 7, as shown in Figs. 1 and 2, and the spindle B of the drill-press A, being rotated and imparting its rotary motion to spindle 5 of the tapping device, the latter and spindle B, by means of the movable sleeve h, as described, are moved toward table J in the direction indicated by the arrow in Fig. 2, causing the lower end of the tap 7 to strike the piece N at its proper drilled place, and thereby the

downward motion of the spindle 12 and the clutch 16 ceases; but the spindle 5, the case 3, and its contained pinions are moved still farther downward until the clutch-section 15 shall be drawn out of engagement with the under side of the clutch 16 and the upper clutch-section 9 shall be fully engaged with the upper side of said clutch 16. At this point of the operation spindle 12 and the tap 7 have a right-hand rotation corresponding with that of spindle 5, and the tap becomes engaged in said hole in piece N, and the operator ceases to feed spindle B downward. The piece N being held firmly on the table J, the downward movement of the tap 7 by its screw engagement therewith causes the latter, the spindle 12, and the clutch 16 to be drawn downward, and when said hole shall be fully tapped the upper side of clutch 16 is parted from clutch-section 9, and its lower side becomes engaged with the clutch-section 15, as shown in Fig. 3, whereby the motion of spindle 12 and the tap is automatically reversed, and the tap is thereby turned out of the tapped hole, and as it and spindle 12 move up, the clutch 16 is again brought into engagement with the clutch-section 9, and spindle 12 and the tap are again given a right-hand rotary motion preparatory to repeating the operation in another hole in the same or in another piece of metal.

From the above description it is clearly seen that by means of this device tapping operations can be very rapidly accomplished.

What I claim as my invention is—

1. In a tapping device, a driving-spindle and a driven tap-carrying spindle, both in axial alignment, but having no direct connection with each other, the driven spindle having one end entering a socket in the adjoining end of the driving-spindle and having a longitudinal movement therein, a united pinion and clutch-section fixed on said driving-spindle, a similar pinion and clutch-section running loosely on said driven spindle, and a clutch fixed thereon between said two clutch-sections engaging alternately with each, and intermediate gearing, substantially as described, connecting the clutch-sections on said driving and driven spindles, combined and operating substantially as described.

2. In a tapping device, a suitable case, substantially as described, a driving-spindle passing through the cover of said case, having its outer end formed to engage with a rotating spindle, and a socket in its end within the case, a pinion 8, having a clutch-section thereon fixed on said driving-spindle, a driven spindle 12, passing through the bottom of said case, having its inner end entering said socket in the driving-spindle and having a longitudinal movement therein, a pinion 14, having a clutch-section thereon turning loosely on said driven spindle, a clutch 16, fixed on said spindle 12 between said two clutch-sections, a pinion 21, engaging with said pinion 8, and two pinions 17 and 18, rotating coincid-

ingly, pinion 17 engaging with said pinion 21 and pinion 18 with said pinion 14, combined and operating substantially as set forth.

3. The combination, with the tapping device K, having the driving-spindle 5, of the spindle B, engaging with said spindle 5, the rack-sleeve h, inclosing spindle B, and the

post 6, fixed on the tapping device and attached to said sleeve, substantially as set forth.

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