

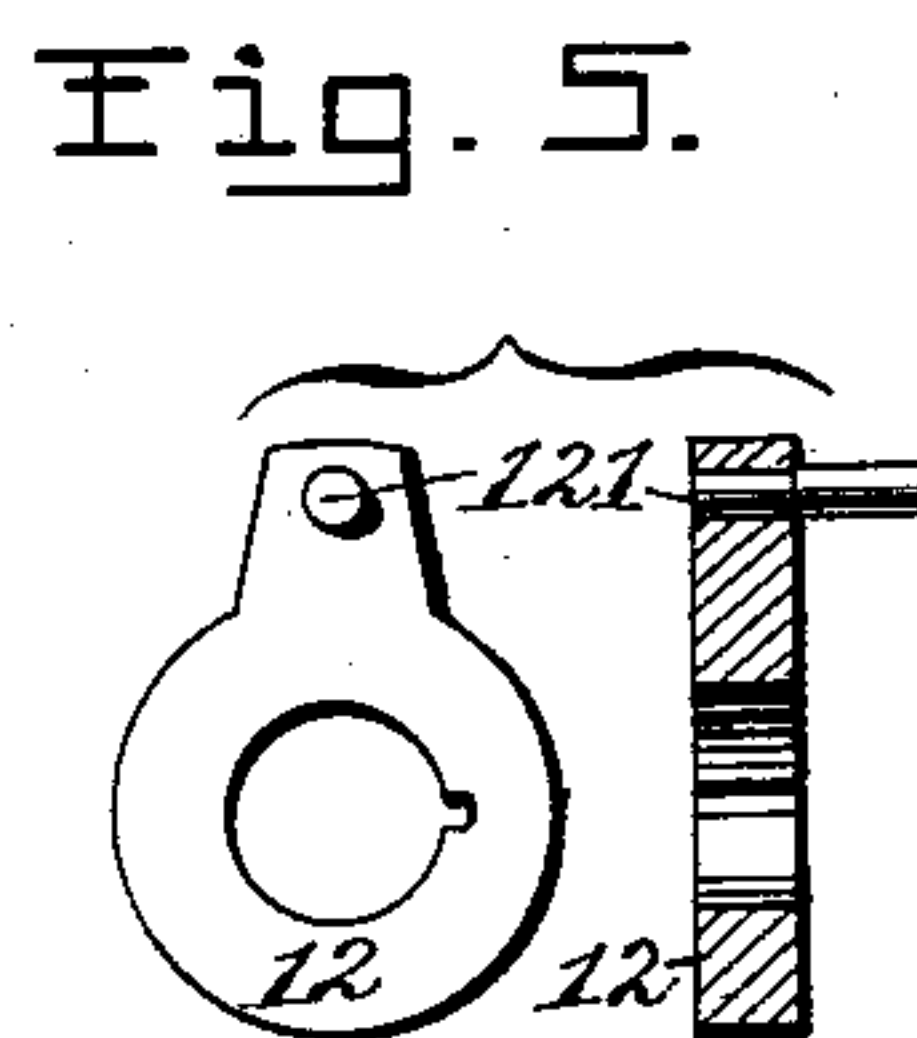
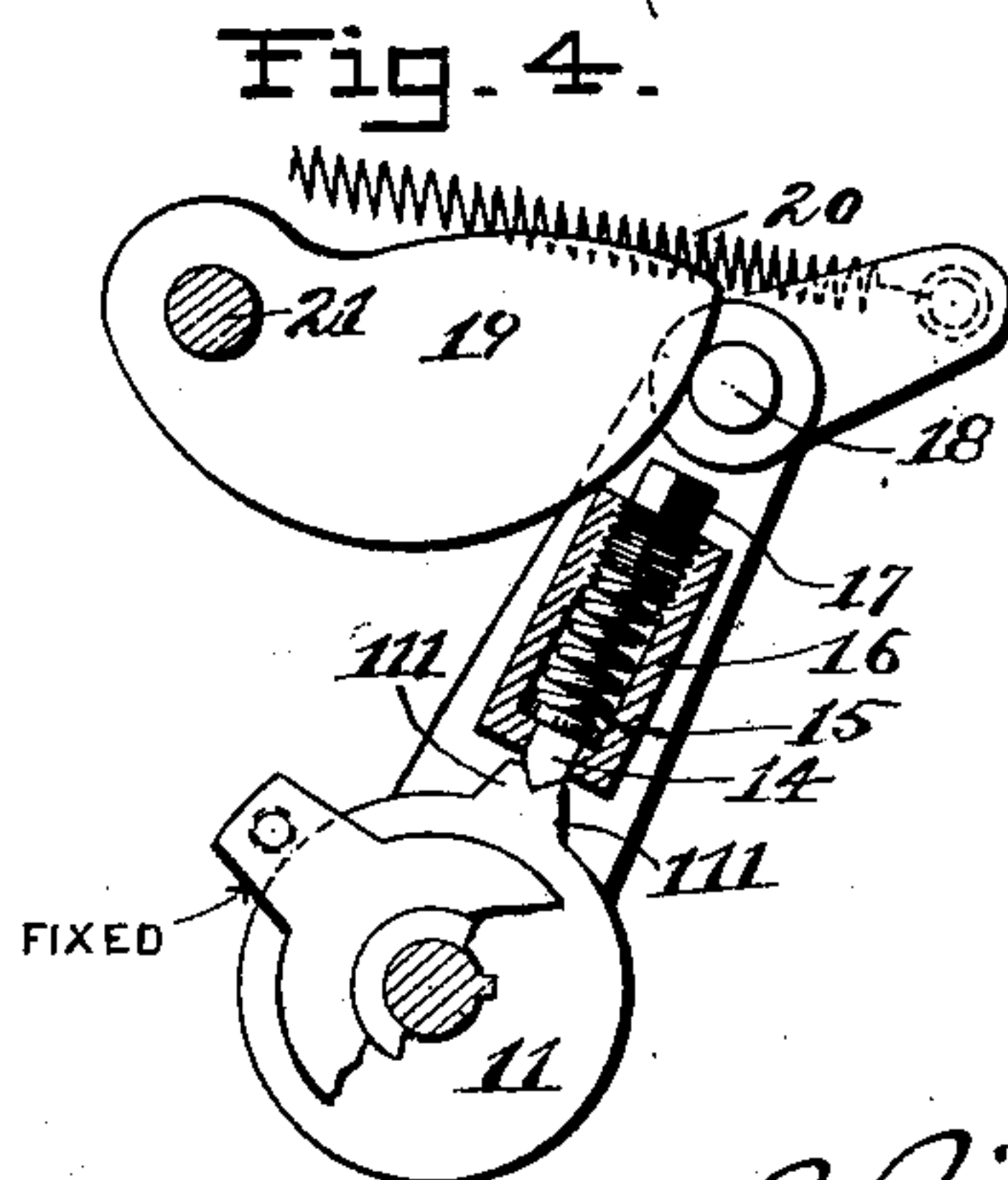
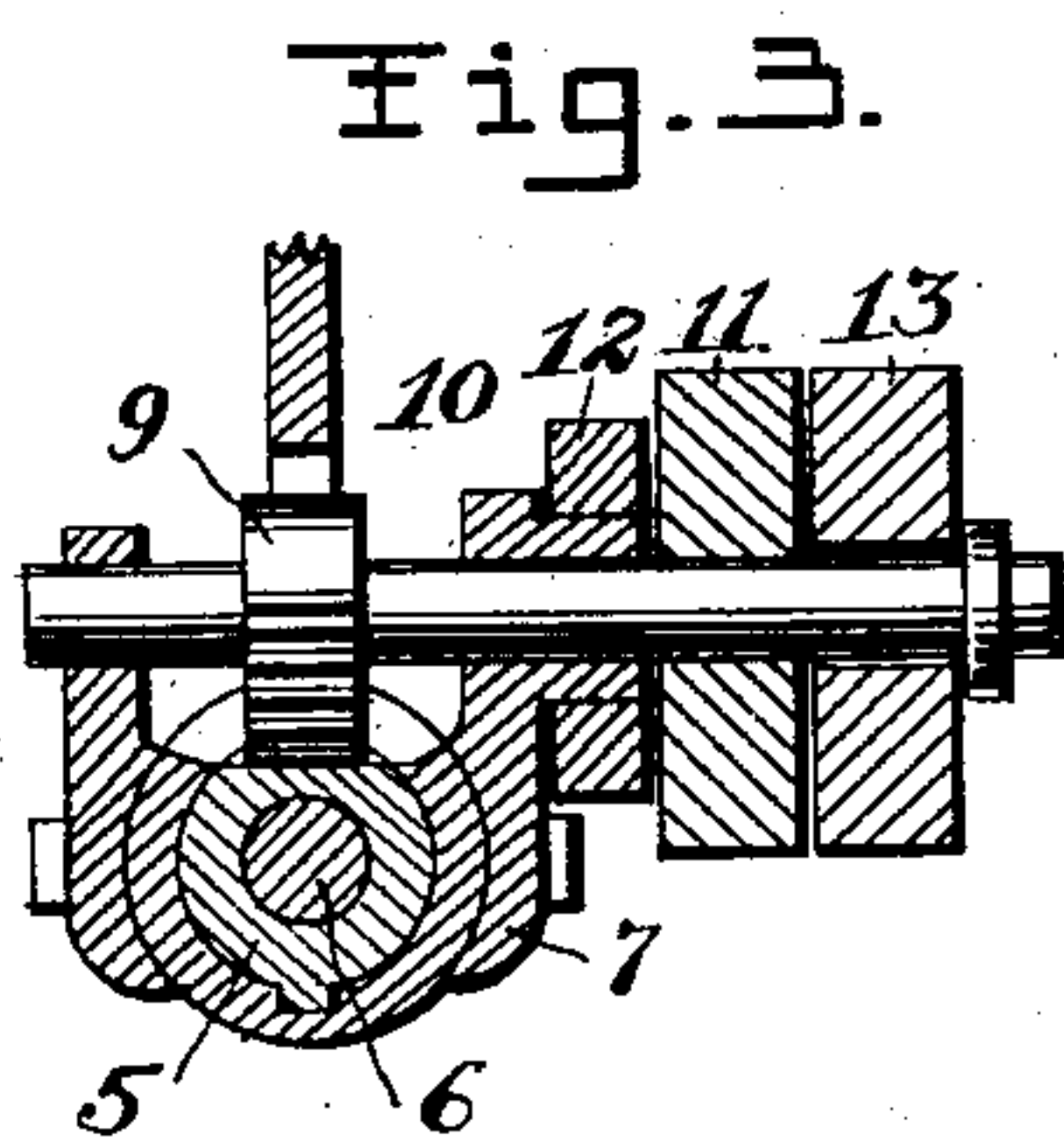
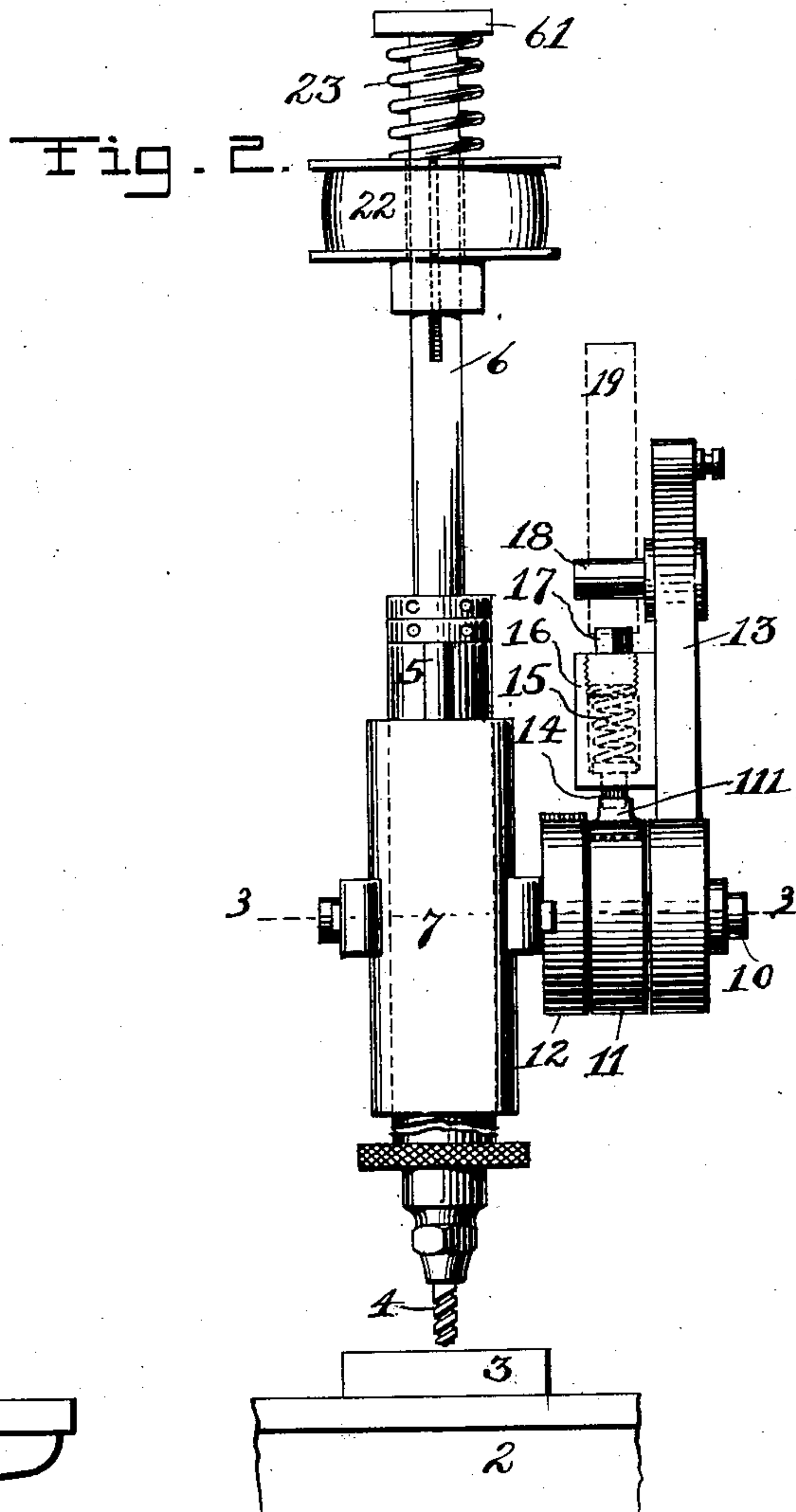
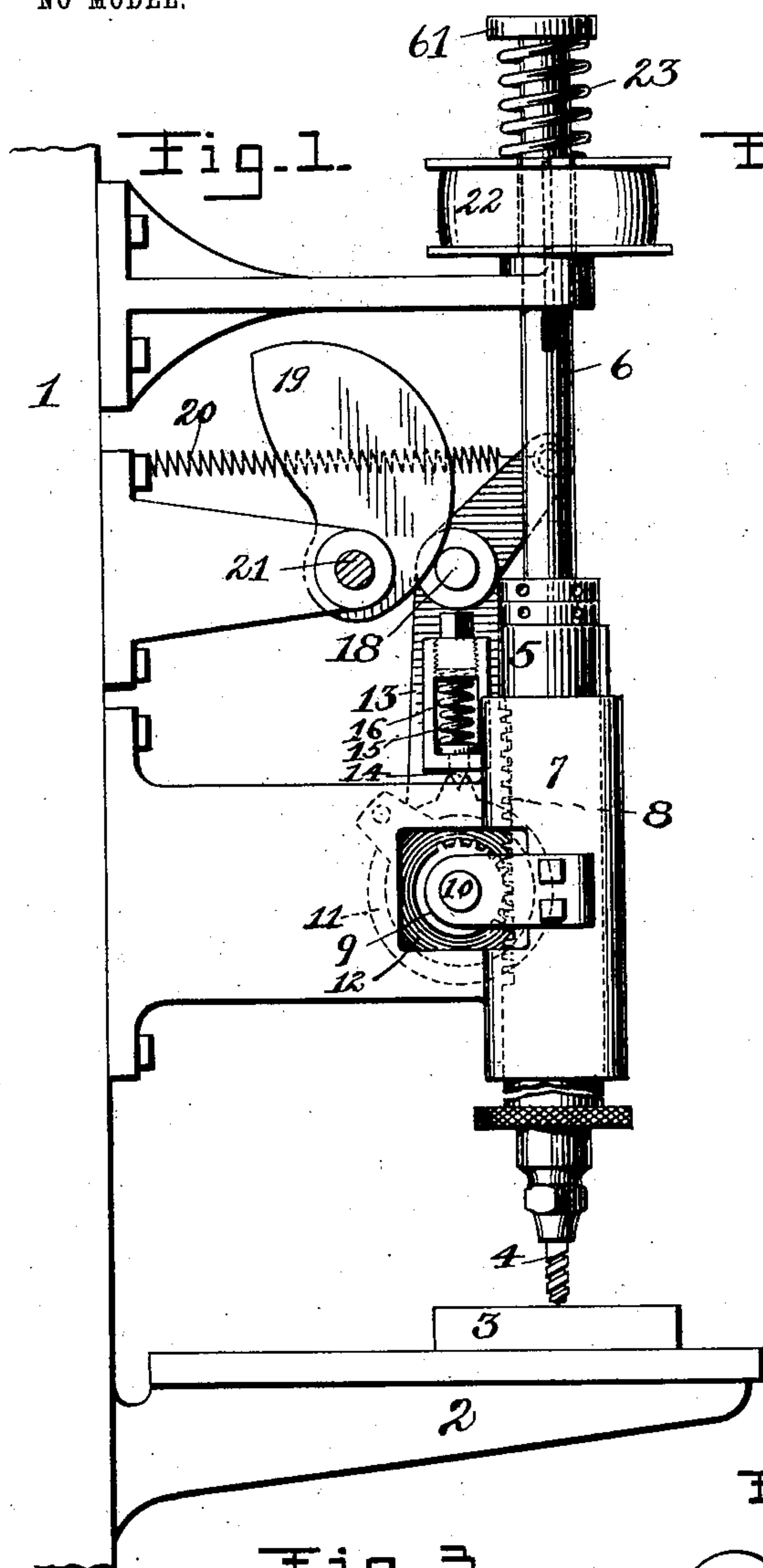
No. 744,396.

PATENTED NOV. 17, 1903.

G. B. PICKOP.  
MECHANICAL DRILL.

APPLICATION FILED JAN. 18, 1902.

NO MODEL.



Witnesses  
Frank S. Ober  
*[Signature]*

George B. Pickop, Inventor  
By *[Signature]* Attorney



# UNITED STATES PATENT OFFICE.

GEORGE B. PICKOP, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO P. & F. CORBIN, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## MECHANICAL DRILL.

SPECIFICATION forming part of Letters Patent No. 744,396, dated November 17, 1903.

Application filed January 18, 1902. Serial No. 90,241. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. PICKOP, a citizen of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Mechanical Drills, of which the following is a full, clear, and exact description.

My invention relates to drilling-machines. The object of my invention is to provide an improved means whereby the feed of a drill into material to be bored will be automatically checked in the event the drill is too dull to accomplish its function properly or in the event the material to be bored is so hard as to endanger the breaking of the drill.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a section on the line 3 3. Fig. 4 is a side elevation of parts of the mechanism shown in Fig. 1, said parts being in a different position from that shown in said figure. Fig. 5 includes a side and section elevation of a single detail of construction.

In the particular form of mechanism shown 1 is a suitable frame or standard. 2 is a table carried thereby and upon which the work may be placed.

3 is a block of material to be drilled or bored and in position underneath the drill 4. 5 is a carrier.

6 is a shaft revolubly mounted in the carrier 5 and provided with a suitable chuck at its lower end to hold the drill 4. The shaft 6 is incapable of longitudinal movement independent of the carrier 5, but may revolve therein. The carrier 5 is mounted so that it may be moved longitudinally in a guide 7, but it does not rotate therein.

8 is a rack on the rear of the guide 7.

9 is a pinion meshing with the rack 8.

10 is a shaft carrying the pinion.

11 is what I shall term a "contact" device.

The said contact device 11 is fixed upon the shaft 10.

12 is a stop-supporting member fixed upon some suitable part of the frame or projection therefrom. (See Fig. 3.)

121 is a stop carried by member 12. The stop 121 stands in the path of movement of

a projection or tooth 111 upon the contact device 11. When the drill is in its most elevated position, one of the teeth 111 may bear against the stop 121.

13 is a lever-arm, the hub of which is loosely mounted upon the shaft 10.

14 is a contact member carried by the arm 13 and adapted to detachably connect said arm 13 with the device 11.

In the particular construction shown herein 15 is a spring carried in a suitable box 16 on arm 13, the tension of which spring is governable by an adjusting-screw 17. The spring bears against the inner end of the contact member 14. The outer end or nose of the device 14 is preferably tapered or pointed, as best shown in Fig. 4, to present two inclined surfaces which may engage in a notch in the contact device 11, for example, such a notch as shown between the teeth 111 111. It will be seen that when the nose of the contact member 14 is in the aforesaid notch the parts are coupled together, the degree of resistance necessary to break said connection being variable according to the adjustment of the spring 15.

18 is a pin or bearing on the arm 13, against which a cam 19 may bear.

20 is a spring adapted to cause the pin 18 to bear against the perimeter of the cam 19 and follow its irregularities. The cam 19 is mounted upon a suitable revoluble shaft 21.

22 is a pulley mounted on shaft 6 and connected thereto by a feather spline, allowing the shaft to move up and down in said pulley.

23 is a spring located between the pulley 22 and the head 61 of the shaft 6. The spring 23 in the particular form shown is a coil-spring normally adapted to expand. Consequently it tends to lift the shaft 6 and the drill 4; but its power is not enough to overcome the positive action of the cam 19, which depresses said shaft through the connections aforesaid. It should be understood that I regard a counterweight as the full equivalent of either the spring 20 or 23, the application of a counterweight being too well known to require illustration.

In operation, suppose the contact device 11 is turned back until the projection thereon engages with the stop 121, and assume that the arm 13 is in a proper position to permit



the contact member 14 to be engaged with the contact device 11. Also assume that a block of metal of a quality too hard to be bored is in position under the drill 4. When the machine is started, the cam 19 revolves, rocking the arm 13. The forward movement of the latter rotates the shaft 10, and thereby causes the depression of the carrier 5 and shaft 6 until the drill 4 is brought into contact with the unduly hard material. The resistance offered by this metal is such that the downward feed of the drill 4 is stopped; but inasmuch as the other parts continue to move the cam forces the arm 13 ahead and breaks the connection between the contact device 11 and the contact member 14, the nose of the latter slipping out of the notch in the former. The spring 23 then elevates the carrier 5, the drill and its associated parts, and the tooth or projection 111 on the device is returned to its starting position against the stop 121. As the cam 19 continues revolving, the arm 13 is rocked forwardly and backwardly, but the drill remains stationary. If the pull of the spring 20 were strong enough, it would cause the contact member 14 to snap into the notch between said teeth 111, 111 at each retraction of the arm 13, but it is preferred that the pull of the spring 20 be insufficient to effect this connection, thereby avoiding undue wear of the parts. Were it effected, the action of the parts would be repeated as before—that is, the connection would be broken when the drill reached the impenetrable material and the parts would return to the starting position, as before described. As soon as the operator detects the fact that any particular drill is not working he ascertains the reason, corrects the fault, waits until the low point in the cam is reached, and then manually forces the lever-arm 13 back until the member 14 snaps into the notch between the teeth 111 on device 11.

I claim—

1. In a drilling-machine, a reciprocatory carrier, means for normally retracting said carrier, a controlling device including a rack, pinion and a lever-arm concentric with said pinion, means for moving said lever-arm to and fro, and a spring-pressed detent having

a one-point connection, said detent being located between the lever-arm and the carrier to hold the arm in its operative connection or entirely release it therefrom.

2. In a drilling-machine, a reciprocatory carrier, a guide therefor, a rack for said carrier, a pinion in mesh with said rack, a contact device connected with said pinion, a lever-arm concentrically and rotatably mounted with relation to said contact device and said pinion, and a detent carried by said lever-arm having a one-point connection with said contact device for holding the parts in their operative connections or releasing them therefrom.

3. In a drilling-machine, a reciprocatory carrier, a guide therefor, a rack for said carrier, a pinion revolvably mounted and in mesh with said rack, a contact device connected with said pinion, a lever-arm mounted to move with said contact device at certain times, but independent thereof at other times, said lever and contact device having a common axis of rotation, a detent carried by the lever-arm having a one-point connection with the contact device whereby the lever-arm may move with it but independent of the contact device, means for moving said lever-arm and means for varying the pressure of engagement between the detent and the contact device.

4. In an apparatus of the character described, a movable carrier, a guide therefor, a rack and pinion, a lever-arm mounted concentric with said pinion, a cam for swinging said lever-arm, means to cause said lever-arm to normally move toward said cam and a yielding detent having a one-point connection between the lever and the pinion whereby the movement of the carrier may be automatically checked and the arm retracted independently of the carrier.

Signed at New Britain, Connecticut, this 15th day of January, 1902.

GEORGE B. PICKOP.

Witnesses:

G. ERNEST ROOT,  
C. A. BLAIR.