No. 744,395. PATENTED NOV. 17, 1903.

G. B. PICKOP.

DRILLING MACHINE.

APPLICATION FILED JAN. 18, 1902.

NO MODEL.

Fig. 1.

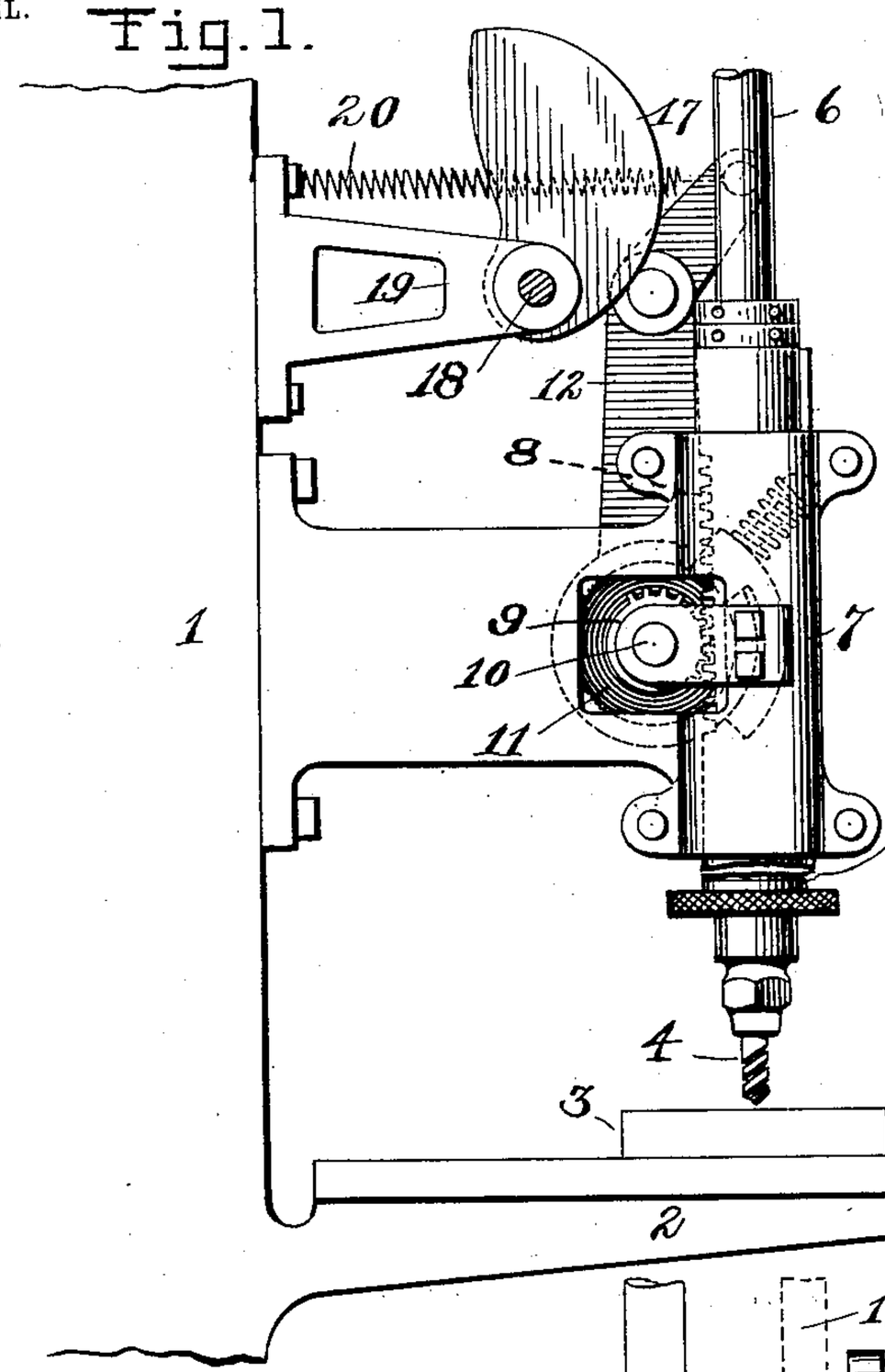


Fig. 4.

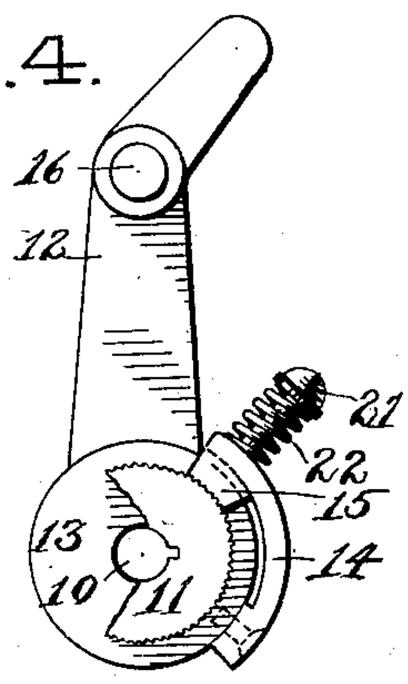


Fig. 5. Fig. 6.

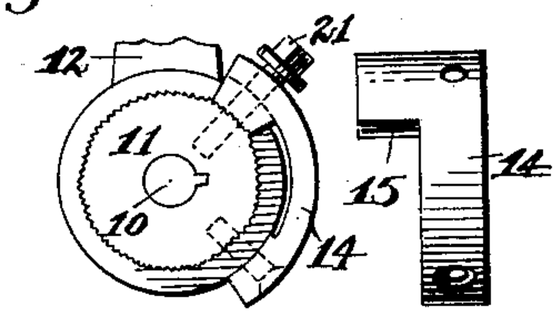


Fig. 2.

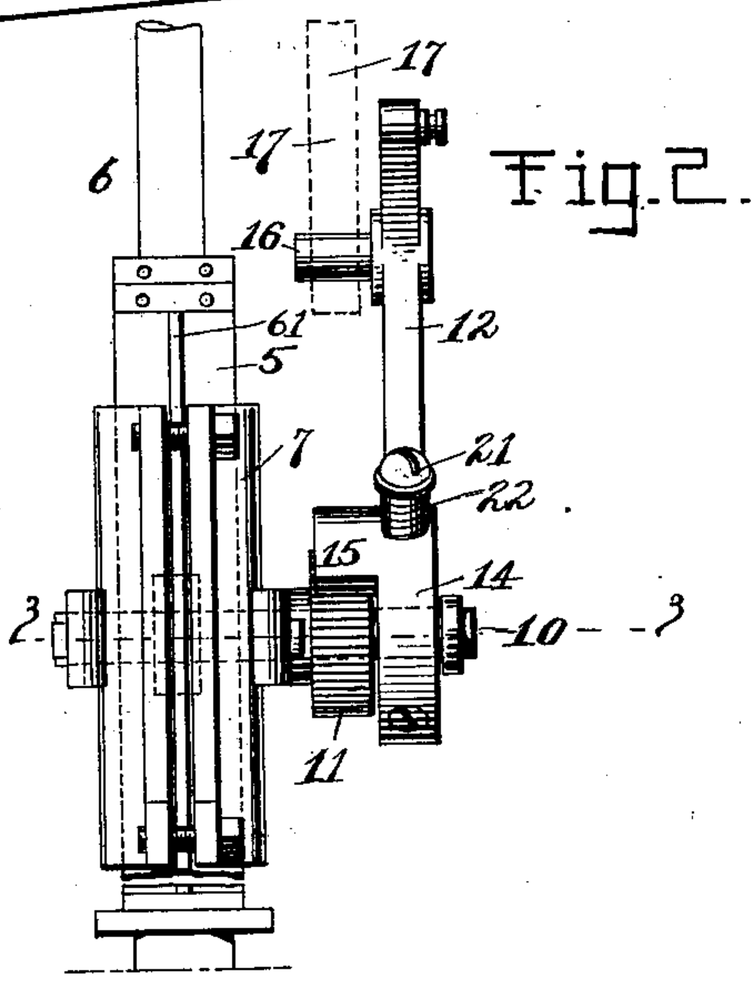
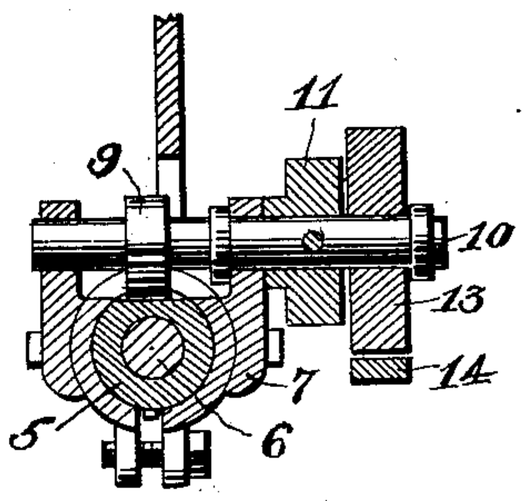


Fig. 3.



Witnesses
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By his Attorney R. C. Mitchell

No. 744,395. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

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

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 744,395, dated November 17, 1903.

Application filed January 18, 1902. Serial No. 90,240. (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 Drilling-Machines, 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 a simple and effective means whereby the feed of the drill into the 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 a drill provided with my improved cut-out mechanism. Fig. 2 is a front elevation of a portion of the same, the parts being in the same relative position. Fig. 3 is a cross-section on the line 3 3. Figs. 4, 5, and 6 are elevations of details of construction.

In the particular form of the mechanism shown in the drawings 1 is a suitable frame or standard.

2 is a table upon which the work may be placed.

3 is a block to be drilled or bored and placed in position on the table underneath a drill 4.

5 is a carrier for the shaft 6, which may be provided with any suitable form of chuck at its lower end to hold the drill 4. The carrier 5 is mounted in a suitable guide 7, projecting from the frame 1. The carrier may be moved up and down; but it is not necessarily revolved. The shaft 6, however, may revolve within the carrier, but is elevated up and down by said carrier.

8 is a rack on the rear of the carrier, into which meshes a pinion 9, carried on the shaft 10, which may have suitable bearings at one side of the guide 7.

11 is a contact member fixedly secured upon the shaft 10 and located, preferably, to one side of the guide 7, as best seen in Fig. 2.

12 is a lever-arm having a suitable hub 13, loosely mounted upon the shaft 10 and adjacent to the contact member 11.

14 is a second contact member carried by the hub 13 of the lever-arm 12. 15 is a bearing-face upon the second contact member 14, adapted to engage with the first contact member 11.

16 is a pin or shoulder on the lever 12, adapted to be engaged by cam 17, which cam is fixedly mounted on shaft 18, which in turn is borne by a suitable support 19.

20 is a spring which performs the function of retracting-lever 12, so that the pin 16 will bear against the perimeter of the cam 17. As the cam 17 revolves the arm 12 is rocked back and forth. This rocking movement of the arm imparts a rotary movement to pinion 9, which in turn imparts a reciprocating movement to the carrier 5, which latter carries the drill 4 up and down, according to the direction of swing of the arm 12.

It should be understood that I regard a counterweight as the full equivalent of the spring 20.

The first contact member 11 is preferably provided with one or more notches or knurls, against which the contact-shoulder 15 of the second contact member 14 may bear. The bearing-face of the part 15 may be notched or knurled in a manner similar to the notching or knurling on the first contact member 11. The second contact member 14 is secured positively at one end to the hub 13, while the other end may be steadied or guided by the stud 21, which may take into the hub in any desired way. In the form shown in Fig. 4 the stud 21 is in the form of a screw, the head of which is spaced apart from the member 14 sufficiently for the insertion of a coil-spring 22.

From the foregoing it is manifest that either the spring of the part 14 may be availed of to secure proper engagement between the contact members 11 and 14, or a spring 22, such as shown in Fig. 4, may be employed to that end, or, if desired, both the spring of the metal in the part 14, together with the spring 22, may be so employed. One advantage of the construction shown in Fig. 4 is that it affords a means whereby the degree of resistance or pressure of the contact between parts 11 and 14 may be varied at will by setting up or retracting the screw 21, which determines the tension of the spring 22. In op-

eration it is intended that the degree of pressure between the contact members 11 and 14 shall be such as to practically couple the cam-actuated lever with the feeding mechanism for the drill, so that in ordinary use the drill will be fed up and down. If, however, undue or dangerous resistance is applied to the end of the drill, the connection between the parts 11 and 14 will be broken. Thus the lever-arm 12 will be advanced by the cam 17 without feeding the drill into the material to be bored. As soon as the drill is brought into contact with material which is unduly hard the contact-face 15, bearing upon the contact member 11, will slip, whereupon the drill will not be forced into the metal. The slipping of said parts will continue until the high point on the cam is reached, whereupon the drill will then be elevated, and so long as the machine continues running the drill will be carried up and down, but will never descend below what I may term the "danger-line." As soon as the operator detects the action of the machine he may remove the material which has caused the trouble and restore the parts to their operative position, whereupon upon the insertion of a piece of material of the proper qualities, the drill will be fed into the same and retracted in the intended way.

Manifestly the invention is capable of a large variety of modification.

In Fig. 2 I have shown the guide 5 as provided with a spline 61, which may take into a suitable groove or slot in the side of the guide 7. This spline serves to prevent the rotation of the carrier 5. Hence the rack 8 is always presented to proper contact with the pinion 9. This same end may of course be effected in a variety of ways.

Manifestly the invention is susceptible of a variety of modifications without departing from the spirit or scope of my invention, the essential idea of which is to provide a simple and effective means whereby the feed of a drill into the material to be bored may be automatically checked in the event the drill is dull or the material too hard to be bored with safety.

It should be understood that I regard mere reversal of parts, change in proportions, and such modifications as might be made by the ordinary mechanic skilled in the art as well within the spirit and scope of my invention.

What I claim is—

1. In a drilling-machine, a feeding device including a mechanically-actuated lever and a rack and pinion and yielding means of connection between said lever and said rack and pinion, substantially as described.

2. In a drilling-machine, a drill-carrier having longitudinal movement, a feeding mechanism comprising a cam-actuated lever and a rack and pinion and yielding means of connection between said lever and said rack and pinion.

3. In a drilling-machine, a longitudinally-movable drill-carrier, a rack thereon, a pinion adjacent thereto and meshing with the rack, a shaft supporting said pinion, a swinging lever and a yielding connection between said swinging lever and the pinion, and a cam for operating said lever.

4. In a drilling-machine, a reciprocatory drill-carrier, a guide therefor, a rack on said carrier, a pinion pivotally mounted adjacent thereto and in mesh therewith, a contact member pivotally mounted concentric with the pinion-supporting shaft, and a lever-arm concentrically mounted relatively to the pinion and contact device, but loosely relatively to the shaft, and a friction device carried by one of said parts and adapted to engage the other part, and means for operating said lever-arm.

5. In a drilling-machine, a reciprocatory drill-carrier, a guide therefor, a rack on said carrier, a pinion pivotally mounted adjacent thereto and in mesh therewith, a contact member pivotally mounted concentric with the pinion-supporting shaft, and a lever-arm concentrically mounted relatively to the pinion and contact device, but loosely relatively to the shaft, and a friction device carried by one of said parts and adapted to engage the other part, to detachably hold the same in operative relation, and means for operating said lever-arm.

6. In a drilling-machine, a reciprocatory drill-carrier, a guide therefor, a rack on said carrier, a pinion pivotally mounted adjacent thereto and in mesh therewith, a contact member pivotally mounted concentric with the pinion-supporting shaft, and a lever-arm concentrically mounted relatively to the pinion and contact device but independent thereof, means for operating said lever-arm, and a friction device carried by the lever and adapted to detachably engage said lever-arm with said contact device.

7. In a device of the character described, a reciprocatory drill-carrier and a guide therefor, a rack on said carrier and a pinion in mesh therewith said pinion being fixedly mounted upon a shaft, a contact member mounted upon said shaft, a lever rotatably supported on said shaft and a spring-pressed frictional device carried by the lever and adapted to engage said contact device, a cam coacting with the lever and means to normally move the said lever toward said cam.

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

GEORGE B. PICKOP.

Witnesses:
G. ERNEST ROOT,
C. A. BLAIR.