(No Model.)

J. KINDRED.

DRILLING MACHINE.

No. 480,907. Patented Aug. 16, 1892.

Fig. 1.

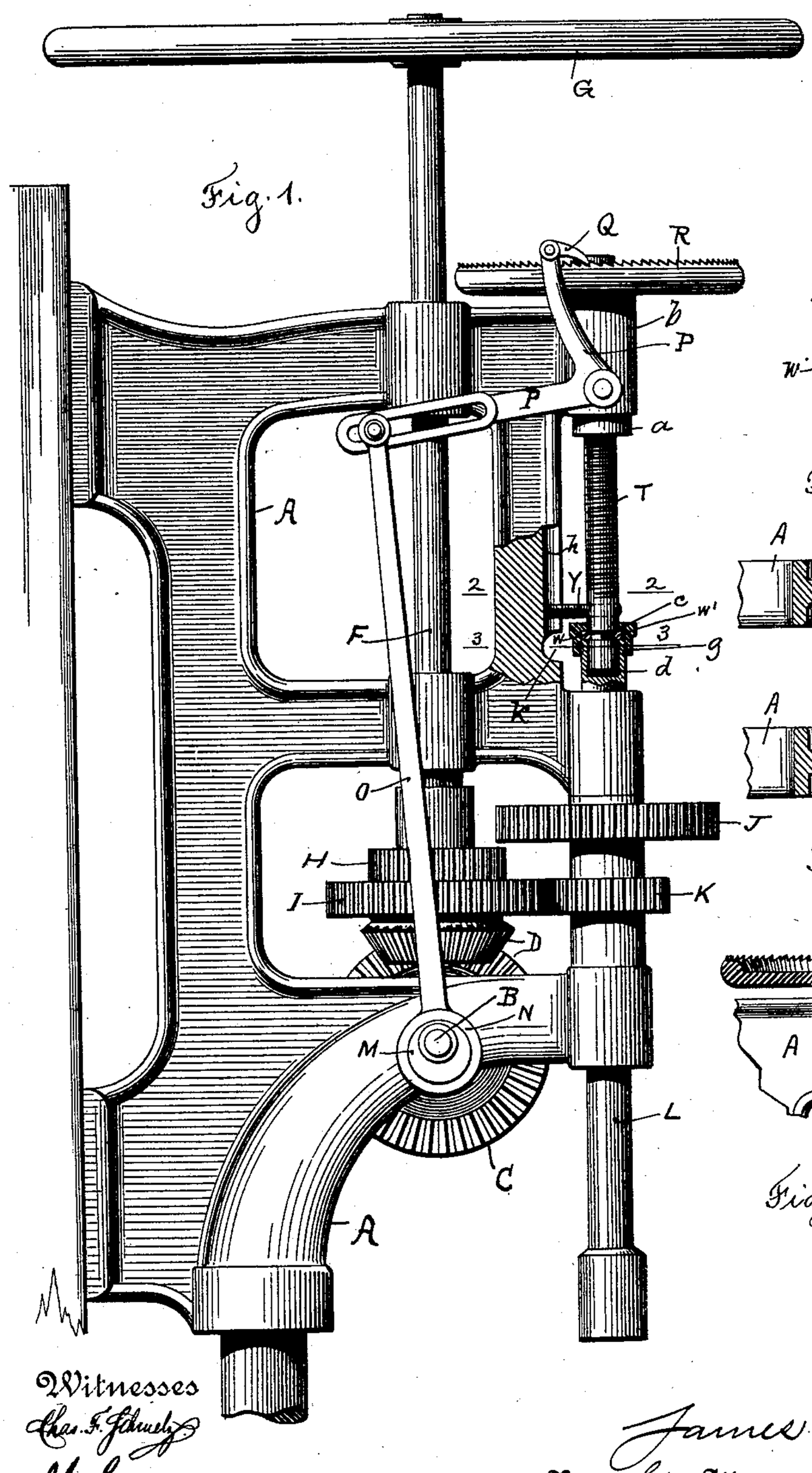
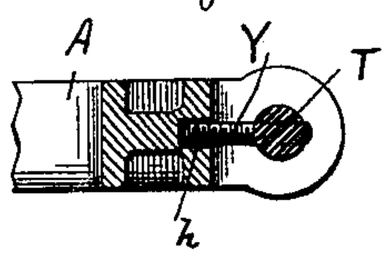


Fig. 5.

Fig. 2.



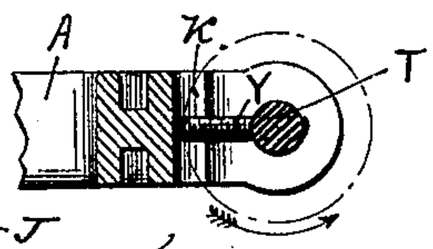


Fig. 3.

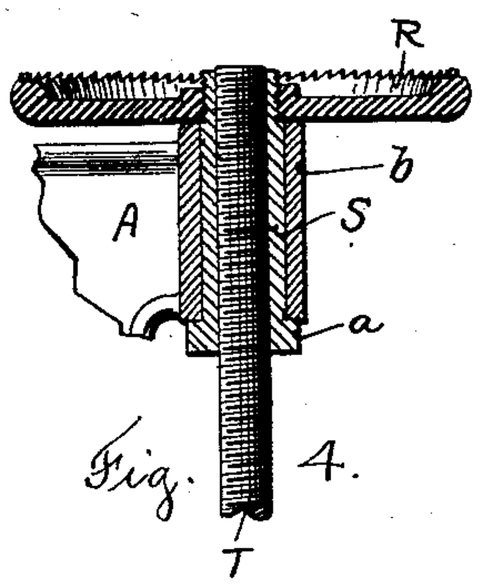


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

JAMES KINDRED, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO BOYNTON & PLUMMER, OF SAME PLACE.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,907, dated August 16, 1892.

Application filed February 27, 1892. Serial No. 422,962. (No model.)

To all whom it may concern:

Be it known that I, JAMES KINDRED, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Drilling-Machines, of which the following is a specification.

The aim of this invention is to improve the construction of drilling-machines; and to this end the invention consists of the device described and claimed in this specification and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a drilling-machine with my improvements applied thereto. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a central longitudinal section of the revolving nut, and Fig. 5 is a plan of the split washer used in the coupling.

In drilling-machines or drills having a positive or other feed when the spindle reaches the limit of its movement the same will come to a positive stop, and unless the machine is carefully watched and the feed then disconnected or the machine stopped some part of the feed mechanism will be broken as the machine continues in operation.

The object of my invention is therefore to automatically disconnect the feeding mechanism when the spindle reaches the limit of its movement, and while my improvement is applicable to any drilling-machine I will further describe the same as applied to one of the well-known forms of blacksmith's drill, but with the distinct understanding that my invention may be applied to any form of drilling-machine.

Referring now to the drawings and in detail, A represents the framing of the machine, and B the power-shaft, which may be driven by a hand-wheel or from a belt-cone in the usual manner. On the shaft B is arranged a large bevel-gear C, which meshes with the small bevel-gear D on the vertical shaft F, upon which is mounted a balance-wheel G. On the shaft F are keyed two gears H and I, which may be slid up and down on the shaft, so that either may be made to engage their corresponding gears J and K, which are keyed to the drill-spindle L. This gearing is of a well-known type and needs no specific description, and the function of the same is to drive the drill-spindle at either of two speeds relatively to the power-shaft.

On the end of the shaft B is mounted or fastened the eccentric M, and surrounding the same is the strap N, which is connected by link O to the bell-crank lever P, pivoted on the frame A. The bell-crank lever P is slotted, so that the link O may be connected to the same at different points, whereby the feed may be varied. On the other end of the bell-crank lever is attached the pawl Q, which is adapted to coact with the ratchet-wheel R. This ratchet-wheel is fastened to the revolving nut S, which has the collar *a* and is fitted in a bearing *b*, formed in the frame. Tapped into the revolving nut is the feed-screw T, and the same is cut away or channeled, as at *c*, and fitting into the channel thus formed are the half-washers *w* and *w'*. The spindle is counterbored at its end to receive the end of the feed-screw T, as shown, and on the end of the feed-screw and at the bottom of the hole counterbored in the spindle is placed a washer *d*, of any suitable anti-friction material, and the same is thus adapted to take or receive the thrust of the feed. The outside of this end of the drill-spindle L is screw-threaded, and fitting on the same is the coupling-nut *g*, which thus holds the feed-screw and the drill-spindle together and in line, but so that each may revolve independently of each other. Passing through the feed-screw is the removable screw or pin Y, and the end of the same fits into a groove or slot formed on the face of the frame A; but the bottom of this groove or slot is cut away, as at *k*, so that when the spindle reaches the limits of its downward movement the screw Y will no longer be held by the sides of the slot, but will be free to revolve, as particularly indicated in Fig. 3.

The operation is apparent. As the power-shaft is rotated the drill-spindle will be revolved to perform the work and the nut S will be turned, and as long as screw T is held from turning by pin Y the spindle will be fed down; but when the spindle reaches the limit of its downward movement the screw Y will no

longer be held from revolving, but will be free to turn, and thus as the nut S keeps on revolving the screw T will turn with it, and hence there will no longer be any down-feed of the spindle. This action thus automatically stops the feed as the drill-spindle reaches the limit of its downward movement, and this prevents injury to the parts, no matter how much longer the machine is still kept in operation. To return the spindle, all that is necessary is to turn the screw Y so that the same will be in line with and adapted to engage its slot and then turn the ratchet-wheel in a direction to raise the spindle.

My invention is independent of the specific details of construction and may be applied by a skilled mechanic to limit either motion of the drill-spindle of any drilling-machine.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a drilling-machine, the combination of the framing, the drill-spindle mounted therein, and means for revolving the same, of a feeding mechanism consisting of a nut, means for turning the nut, and a screw loosely connected to the spindle, said screw having a projection adapted to engage the framing, and thereby keep the feeding-screw from turning, said framing being cut away, so that the said projection will be free from the framing as the spindle reaches the limit of its downward travel, substantially as described.

2. In a drilling-machine, the combination of the framing, the drill-spindle, and means for revolving the same, of a feeding mechanism consisting of a nut, means for revolving the same, and a screw connected to the spindle, and means for holding said screw from turning until the drill-spindle reaches the limits of its downward movement, consisting of the screw or pin Y, passing through the feed-screw, and a slot, as *h*, formed in the framing, but cut away, as at *k*, so that the feeding mechanism will be automatically rendered inoperative as the drill-spindle reaches the limits of its downward movement, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES KINDRED.

Witnesses:
LOUIS W. SOUTHGATE,
ALFRED D. WARREN.