No. 644,079. Patented Feb. 27, 1900.

E. HUBER.

ATTACHMENT FOR TIGHTENING NUTS.

(Application filed May 31, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

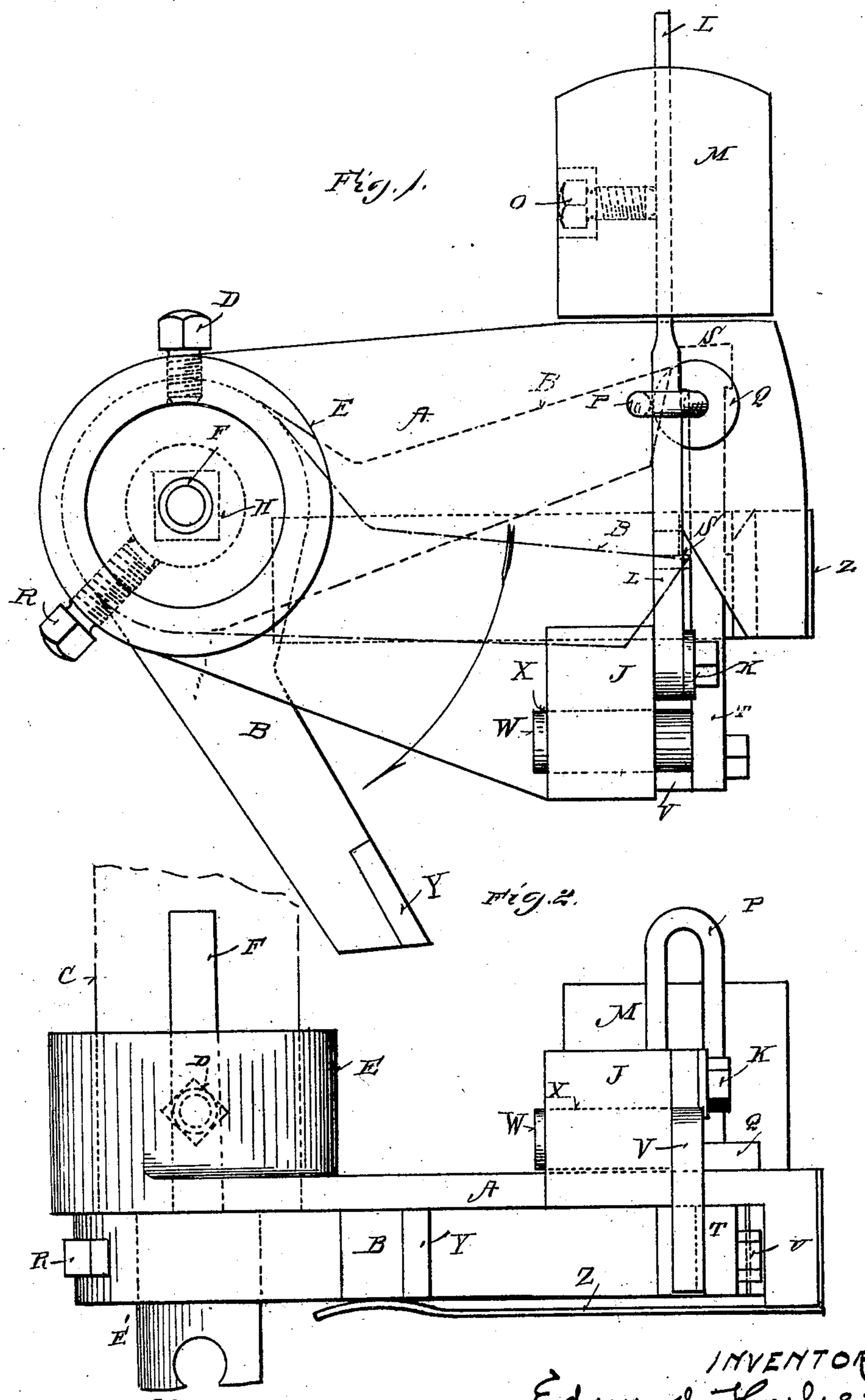

Fig. 2.

WITNESSES:
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W. M. McNair.

INVENTOR;
Edward Huber.
by H. A. Toulmin,
his ATTORNEY.

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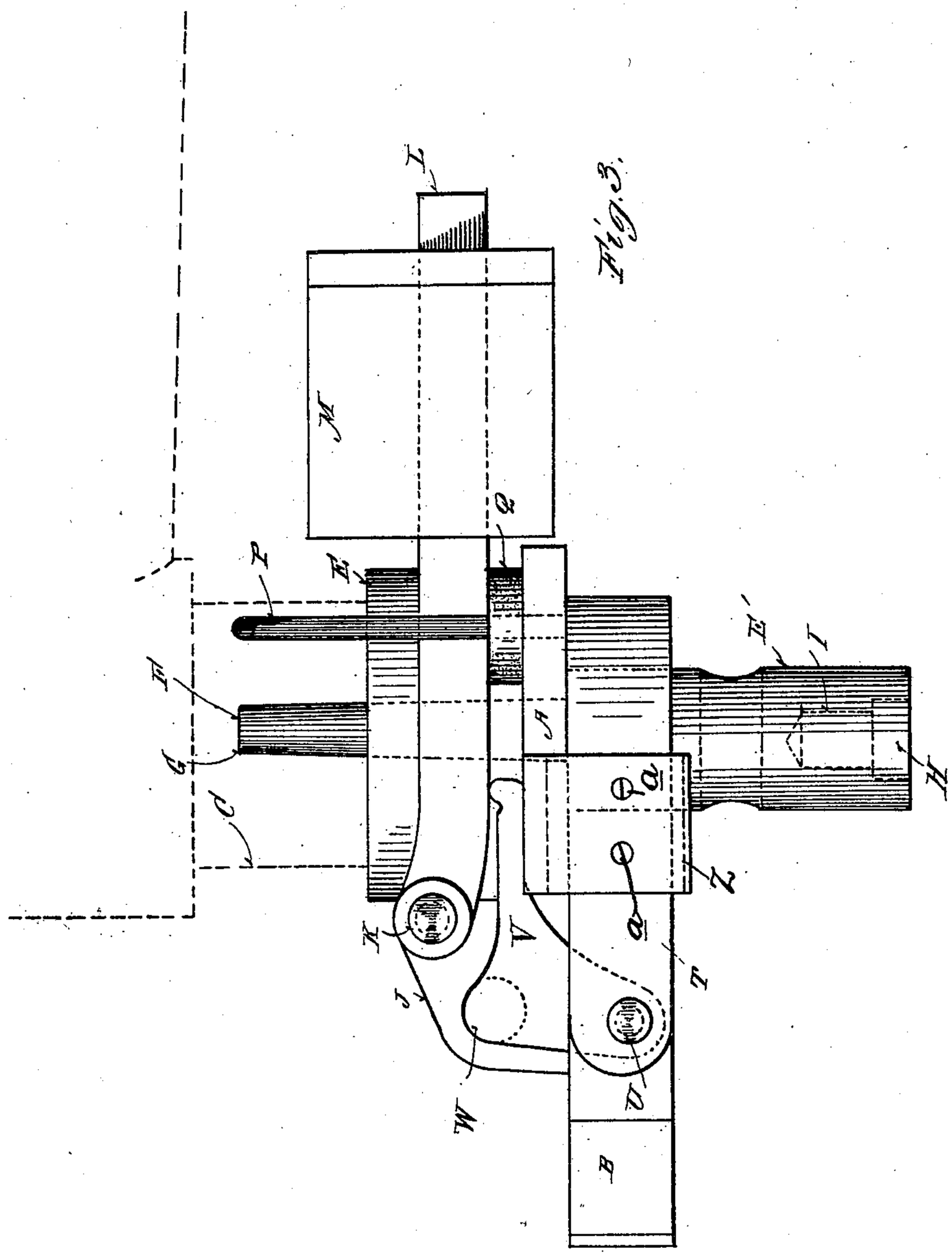

Fig. 3.

WITNESSES:
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UNITED STATES PATENT OFFICE.

EDWARD HUBER, OF MARION, OHIO.

ATTACHMENT FOR TIGHTENING NUTS.

SPECIFICATION forming part of Letters Patent No. 644,079, dated February 27, 1900.

Application filed May 31, 1899. Serial No. 718,903. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HUBER, a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Attachments for Tightening Nuts, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in attachments for drill-presses or other rotating spindle or shaft, specially designed for tightening nuts.

The object of my invention is to provide a suitable device which may be attached to the spindle of a drill or other rotating shaft or spindle and which is adapted to engage with a nut to be tightened and will cease its action upon the nut when it has been sufficiently tightened without stopping the rotation of the driven spindle, the nut-head remaining stationary a sufficient length of time to permit the next nut which is to be tightened to be placed in the proper position in the tightening-head.

My invention also relates to means for governing the tightening of the nut, so that the attachment will cease operating upon it when it has been sufficiently tightened.

My invention also relates to details of construction and operation hereinafter appearing, and particularly pointed out in the claims.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 represents a plan view of my attachment complete; Fig. 2, a side elevation of the same, and Fig. 3 a front elevation of the same.

This attachment may be used in connection with any machine having a rotatable spindle, and preferably consists of two parts—namely, an upper arm A and an operating-lever B and its head E, the former of which is rigidly connected with a drill-spindle C by means of a set-screw D, while the lever B is rigidly connected to the tap-head E′. This head carries a stem F, which is slightly tapered to fit the ordinary tapered hole G in the spindle C, it being understood that such stem is round and made to freely rotate within the hole G, so that there is no direct connection between the tap-head and drill-spindle. The lower end of this tap-head is bored out to receive a tap or nut and the upper end of a bolt, as shown at H and I, respectively.

Referring now to Figs. 1 and 2 particularly, it will be observed that a projection J extends upward from the plate A. This projection carries a stud K, upon which fits one end of a lever L, while upon the other end of said lever fits a sliding weight M, which is held in position by means of a set-screw O, the purpose of which weight will hereinafter appear. A guide P is also mounted upon the arm A and acts to hold the lever in position, since the lever passes through such guide. In order to prevent undue shocks by reason of the weight and its lever dropping, as will presently appear, I provide an elastic cylinder Q, preferably of rubber, which is fitted upon one branch of the guide P and projects beneath the lever L.

Referring now to the manner in which the head E′ is rotated to turn down the nut, it will be observed that upon the said head is rigidly mounted the lever B by means of a set-screw R. The outer end of this lever engages with a shoulder S on the sliding bar T. This sliding bar is mounted upon a stud U, projecting from a bell-crank lever V, such lever carrying a stud W, which extends through the hole X in the projection J. One arm of the lever V projects beneath the weighted lever L. By this construction the sliding bar T is normally held in the position shown in Fig. 3. Thus as the plate A, which is rigidly mounted upon the drill-spindle, rotates, the lever B, rigidly mounted upon the head E′, will also rotate with the same speed; but as the nut tightens, the head E′ will gradually come to a standstill, which action will cause relative movement between the head and the plate A. Consequently as the plate A continues to rotate in the direction of the arrow, as shown in Fig. 1, the sliding bar T, by reason of its engagement with the lever B, will be slid to the dotted position, as also shown

in Fig. 1, which movement will free the lever B from engagement with the shoulder S on the bar T, so that the plate A may rotate past the lever B, and consequently will not operate the head until the lever B again comes into engagement with the shoulder S, it being understood that the weighted lever L pressing upon the bell-crank lever V acts to shift the sliding bar T to its normal position as soon as the lever B disengages from said bar. This movement is accomplished very quickly, and therefore, as above stated, the rubber Q is provided to relieve the sudden jars.

Referring now to the manner in which the head E′ ceases its turning action upon the nut when it has been turned down as snugly as desired, it will be understood that the nut will resist the rotary movement of said head. This will cause the bar T, by reason of the lever B engaging therewith, to be slid from its full-line position to its rear position as the arm A and drill-spindle continue to rotate. This relative movement between the arm and head will permit the lever B to disengage from the shoulder S on the reciprocating bar T. Consequently said lever being wholly disconnected from the bar T, carried by the rotatable arm A, the head will remain at rest. However, as soon as the lever B is disengaged from the bar T said bar will be instantly returned to its full-line position by reason of the weight M acting upon the lever L, such latter lever being connected with the bar T through the bell-crank lever V. Thus as the arm A makes another complete revolution the shoulder S on the bar T will again be engaged by the lever B, so that the head E′ will again rotate with said arm A at the speed of the drill-press spindle. Should it be desired to turn the nut down tighter, the weight M is slid farther out on the lever L, and the head E′ will act longer upon the nut to turn it or until the resistance offered by the nut is sufficient to raise the weighted lever and slide the bar to its dotted position, as above stated, whereby said head is released from further acting on the nut. It will be observed that the outer end of the lever B is provided with a tip-piece Y. This tip-piece is of very hard material, so that it will withstand the wear incident to engaging with and disengaging from the shoulder S. A spring Z projects beneath the sliding bar T and acts to hold it from dropping down as such bar is reciprocated, such spring being held in place in any suitable manner, such as by screws *a*, which screw into the end of the plate A. Thus with my invention I have provided for turning nuts down and giving them varying degrees of tightness and at the same time have prevented the stopping of the drill, while the nut-receiving head will remain stationary to permit of placing a nut in proper position to be operated upon, which can readily be done while the drill makes a complete revolution, as such drill-spindle is made to travel slow for this purpose.

Referring again to the action of the spring Z, it will be understood that it holds the head E′ from dropping down when the drill-spindle is elevated. Thus while the head E′ may be raised and lowered by raising and lowering the drill-press spindle, still it will remain inactive, while the plate A is always active, until the plate A makes a complete revolution and the shoulder S again comes in contact with the point Y, as above described.

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

1. In an attachment for tightening nuts, the combination with a rotatable spindle, of an arm rigidly secured thereto, and a nut-tightening head adapted to be connected with said arm and rotate with said arm and spindle at one time and remain stationary at another, and a movable device interposed between said head and arm to effect such alternate connection and disconnection substantially as shown and described.

2. In an attachment for tightening nuts, the combination with a rotatable spindle, of an arm rigidly mounted thereon, a weighted lever carried by said arm, a reciprocating bar adapted to be operated by said weighted lever into its normal position, a nut-tightening head, a lever rigidly connected with said head and adapted to engage with said reciprocating bar when in its normal position, and disengage therefrom when said bar is reciprocated from its normal position, substantially as shown and described.

3. In an attachment for tightening nuts, the combination with a rotatable spindle having an arm rigidly mounted thereon, of a lever pivotally connected with one end of said arm, and at its other end carrying a sliding weight, a bell-crank lever also pivoted upon said plate, a reciprocating bar pivotally connected to one arm of said lever while the other arm of said lever contacts with said weighted lever, a nut-tightening head loosely mounted in said drill-spindle, a lever projecting from said head and adapted to engage with said reciprocating bar when in its normal position and to disengage from said reciprocating bar when reciprocated out of its normal position.

4. In an attachment for tightening nuts, the combination with a rotatable spindle having rigidly mounted thereon an arm, of a projection extending upward from said arm as also a slotted guide, a lever pivoted at one end to said projection and extending through the slot in said guide, an adjustable weight mounted on the other end of said lever, a bell-crank lever also pivoted to said projection, one arm of which contacts with said weighted lever, a reciprocating bar pivoted to the other arm of said lever, a shoulder on said bar, a

nut-tightening head, having a stem or projection adapted to fit within the rotatable spindle and also having a lever rigidly mounted thereon, said lever being adapted to engage with the shoulder on said reciprocating bar when the bar is in its normal position and disengage therefrom when the power required to turn the nut-tightening head equals or exceeds the weight of the weighted lever, and means carried by the plate to hold the head in position, all substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD HUBER.

Witnesses:

JOHN J. CRAWLEY,

JOHN A. SCHROETER.