(No Model.) 2 Sheets—Sheet 1.

J. H. STERNBERGH & R. PEMBERTON.

SCREW CUTTING MACHINE.

No. 401,601. Patented Apr. 16, 1889.

FIG. 1.

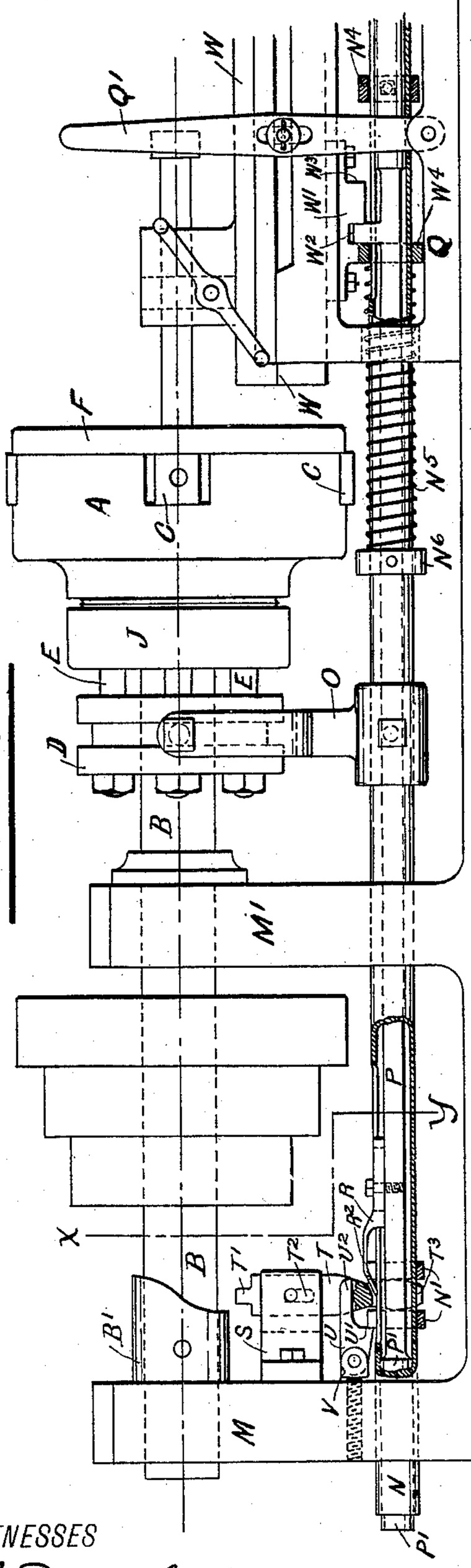

FIG. 2.

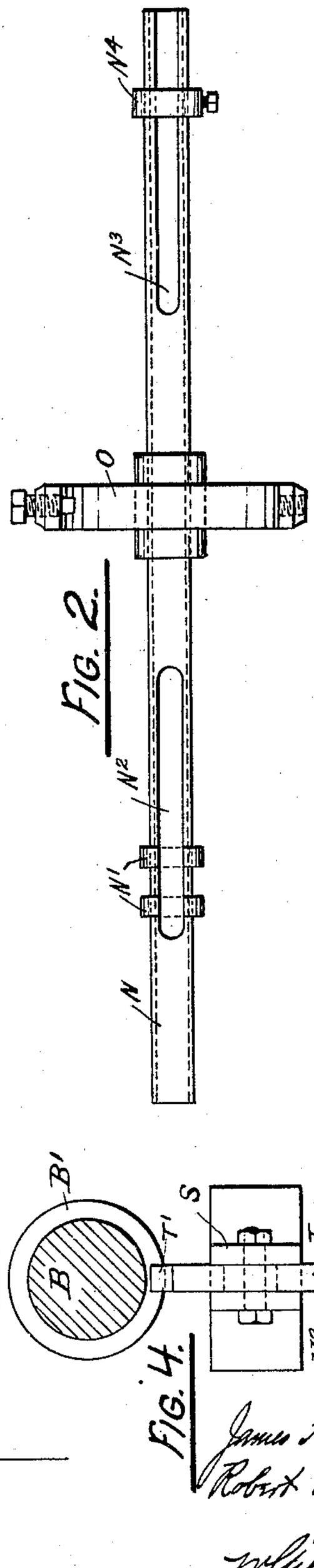

FIG. 3.

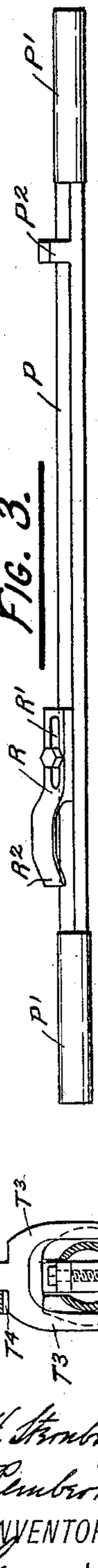

FIG. 4.

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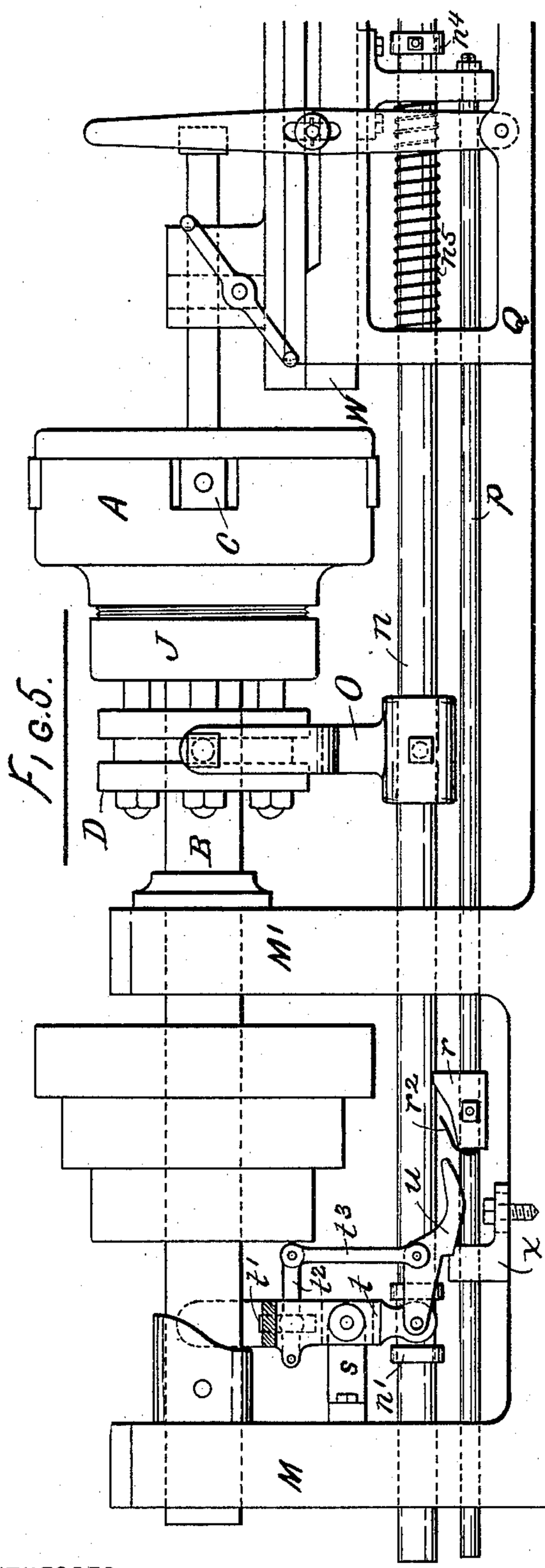

FIG. 5.

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JAMES H. STERNBERGH AND ROBERT PEMBERTON, OF READING, PENNSYLVANIA; SAID PEMBERTON ASSIGNOR TO SAID STERNBERGH.

SCREW-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 401,601, dated April 16, 1889.

Application filed January 26, 1889. Serial No. 297,653. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. STERNBERGH, a citizen of the United States, and ROBERT PEMBERTON, a citizen of Great Britain, both residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Screw-Cutting Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to such machines as screw-cutters, in which it is desired that the cutting-tools be automatically withdrawn from the work when they have reached a fixed point. Heretofore this withdrawal has been effected by the action of a spring which is automatically brought into action at the desired point. The objection to this arrangement is that with certain forms of cutters the sharp cutting-edge is not easily withdrawn from the work and the spring alone cannot be relied upon to promptly accomplish it. The main object of our invention is to effect this withdrawal positively by making the rotation of the spindle which carries the cutters release them from the work at the desired point; also to withdraw the finished work automatically from the cutter-head, so that it may be readily removed and a new blank placed in its position.

The invention consists, broadly, in the combination, with the cutter-head of the machine and the mechanism for withdrawing the cutters, of a rod arranged to operate said mechanism, the rod itself being moved by a lever which is thrown into engagement with the machine-spindle by the movement of the carriage to which the work is secured.

It consists, further, in the combination, with the machine, of a spring arranged to assist in the withdrawal of the cutters from the work and also of the work from the cutter-head. These and other features of the invention are fully set forth herein, and indicated in the claims.

Figure 1 is a full elevation of a portion of a screw-cutting machine, showing the mechanism involving our invention partly in section. Fig. 2 is a top view of the sleeve-operating rod or pipe with collars and sleeve-yoke attached. Fig. 3 is a separate view of the lever-operating rod with the lifter attached. Fig. 4 is a section through X Y of Fig. 1. Fig. 5 shows a modified mechanism applied to a machine, as in Fig. 1.

A represents the die-head secured to spindle B. The cutter-holders C, mounted in head A, may be of any approved form and are adapted to be moved toward and away from the center by rods E, which latter are attached at their outer ends to the sliding sleeve D, the nut J, which is mounted on head A, serving as an adjustable stop to regulate the size of the thread to be cut.

The spindle B is supported in bearings M and M′, forming the head-stock of the machine, and carries a belt-pulley and a cam, B′, the purpose of which will be hereinafter described. A carriage, W, provided with a vise in which the blank to be cut is fastened, can can be moved in its tail-stock Q by means of a slotted lever, Q′.

The rod N, to which the sleeve-yoke O is secured, is represented as a tube passing loosely through the head and tail stocks and inclosing a square rod, P, the ends P′ of which are rounded to loosely fill the tube N. The latter is provided with slots N^2 and N^3 near opposite ends, and also with collars N′ and N^4. The rod P has a projection, P^2, which reaches upward through the slot N^3 and rests in a recess, W^2, formed in an attachment, W′, on the bottom of the carriage, with which the rod P is thus compelled to move.

A lever, T, is pivoted intermediately to a jaw-piece, S, secured to the rear bearing, M, of the head-stock between the mandrel B and the rod N. Its lower end has arms T^3, forming a yoke which spans the rod N between the collars N′ on the latter, and its upper end, T′, is adapted to clear the cam-faced sleeve B′ on the mandrel when in its normal position. A slot, T^2, in which it is pivoted to the jaw-piece S, permits it, however, to be raised when the end R^2 of the lever-lift R, which is adjustably secured to the rod P and projects upward

through the slot N^2, is pushed under its yoke end by the movement of the carriage, and the end T′ is thus brought in contact with the cam-faced sleeve, the rotation of which pushes it forward and the lower end backward, the latter carrying with it the rod N and the sleeve D, which withdraws the cutters.

The lifter R can be adjusted by means of the slot R′, so as to raise the lever into engagement with the cam when the thread has been cut to any desired distance on the blank, which latter pulls the carriage and the rod P with it as the thread is cut. The bolt having been threaded and released by the withdrawal of the cutters, the carriage W is pulled back by means of the lever Q, or pressed back by the spring N^5, hereinafter described, carrying with it the rod P and lifter R until the face W^3 of the carriage attachment W′ touches the collar N^4 on the rod N, which latter is then carried along by means of the lever Q′ until the sleeve D is closed against the stop-nut J, which brings the cutters into position for a new blank and the lever T into its normal position below the cam B′. To retain the rod N in this position, the latch U may be pivoted to a jaw, V, which latter is secured to the machine, so that the shoulder U′ of the latch engages one of the collars N′, which serves as a stop to prevent any movement of the rod N. An arm, U^2, of this latch rests upon an offset, T^4, of the pivoted lever T, which latter, when raised by the lifter R^2, elevates the shoulder U′ until it clears the stop-collar N′ before the top T′ of the lever engages the cam B′. The end R^2 of the lifter R may be shaped, as shown, to form a spring, which will yield somewhat before lifting the latch, and when the latter is released will tend to lift the lever rapidly into engagement with the cam B′.

The spring N^5 is strung upon the rod N between a collar, N^6, and the extension W^4 of the carriage attachment W, through which the rod passes. The movement of the carriage W toward the die-head compresses this spring, which thus tends to move the rod N as soon as the latch has been raised, and assists the cam B′ in completing the movement of the sleeve D. This movement, however, is positively effected by the cam, and the spring is not essential to its accomplishment. The latter, however, has another function to perform. When the cutters are withdrawn from the work, the latter is released and the resilience of the spring, which presses against the attachment W′ of the carriage, moves it automatically away from the die-head, thus leaving a minimum of work to be done by the operator.

It is obvious that the placing of the rod P within the tubular rod N is not essential, and also that the means employed to effect the engagement of the sleeve-operating rod N with the mandrel B, as well as other details of the constructions above described, may be considerably modified without departing from the spirit of my invention, which consists, broadly, in mechanism adapted to withdraw the cutters positively from the work, substantially as set forth, and which prevents the possibility of their holding fast to the work, as is apt to occur when a spring alone is depended upon to withdraw them.

Fig. 5 illustrates a modification such as may be devised, and which is an equivalent of the construction already described. In this arrangement the rod *p* is not inclosed by the rod *n*. It is fastened to the carriage attachment *w′*, and is provided with a lifter, *r*, having a spring, r^2. The lever *t* is pivoted to a bracket, *s*. Its lower end engages the rod *n*, and the top is represented as a yoke spanning the cam B′ to prevent side movement, one arm being broken away to show in full the end of a pin, *t′*, which is raised and lowered in the lever *t* by means of a supplemental lever, t^2, which is connected by a rod, t^3, to the latch *u*, pivoted to the lower end of the lever *t*. This latch, when the cutters are closed, rests upon a stop, X, secured to the machine. The spring N^5 is shown wholly within the tail-stock Q under the carriage W, which it is adapted to press away from the die-head. It is obvious that the operation of this mechanism is substantially the same as that already described, the pin *t′* being lifted, instead of the whole lever T, and the stop X being the equivalent of N′. The spring r^2 of the lifter *r* may be used to effect the object mentioned in describing R^2—that is, to promptly raise the pin *t′* into engagement with the cam B′ after the latch *u* has been raised to clear the stop X.

What we claim is—

1. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod, a lever engaged by said sleeve-rod, and a lever-rod moving with the carriage and arranged to throw said lever into engagement with the machine-spindle, substantially as and for the purpose set forth.

2. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, tail-carriage, and cam on the machine-spindle, of a sleeve-operating rod, a pivoted lever engaged by said sleeve-rod, and a lever-rod and connected mechanism, substantially as described, arranged to throw said lever into engagement with said cam, all substantially as and for the purpose set forth.

3. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod, a lever engaged by said sleeve-rod, a lever-rod arranged to throw said lever into engagement with the machine-mandrel, and a stop-latch, also operated by said lever-rod, all substantially as and for the purpose set forth.

4. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of the sleeve-operating rod and pivoted lever, a lever-rod arranged to throw said lever into engagement with the machine-spin-

dle, a stop-latch operated by said lever-rod, and a spring arranged to move said sleeve-rod, all substantially as and for the purpose set forth.

5. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a slotted tubular sleeve-operating rod with collars N′, a pivoted lever engaging said collars, a lever-rod within said tubular rod provided with an adjustable lifter and attached to the carriage, and a cam on the machine-spindle, all arranged and adapted to operate substantially as set forth.

6. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a slotted tubular sleeve-operating rod with collars N′, a pivoted lever engaging said collars, a lever-rod within said tubular rod provided with an adjustable lifter and attached to the carriage, a cam on the machine-spindle, a spring arranged to move said sleeve-rod, and a stop-latch, all adapted to operate substantially as set forth.

7. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod with lever-collars N′ and carriage-collar N^4, a pivoted lever, a lever-rod provided with an adjustable lifter and attached to the carriage, and a cam on the machine-spindle, all arranged and adapted to operate substantially as set forth.

8. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, sleeve-operating rod, and tail-carriage, of a spring adapted to press said carriage and rod in opposite directions, all arranged substantially as and for the purpose set forth.

9. In a screw-cutting machine, the combination, with the die-head, tail-stock, and carriage, of a spring located in said tail-stock and adapted to retract said carriage, substantially as set forth.

10. In a screw-cutting machine substantially as described, the combination, with the sleeve-operating rod, the lever engaging said rod, and the lever-rod attached to the carriage, of a lifter adjustably secured to said lever-rod and provided with a spring, all adapted to operate substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES H. STERNBERGH.
ROBERT PEMBERTON.

Witnesses:
H. M. M. RICHARDS,
HARRY C. GABLE.