(No Model.)

H. REYNOLDS.

FEEDING DEVICE FOR SCREW MACHINES.

No. 311,785. Patented Feb. 3, 1885.

Fig. 1

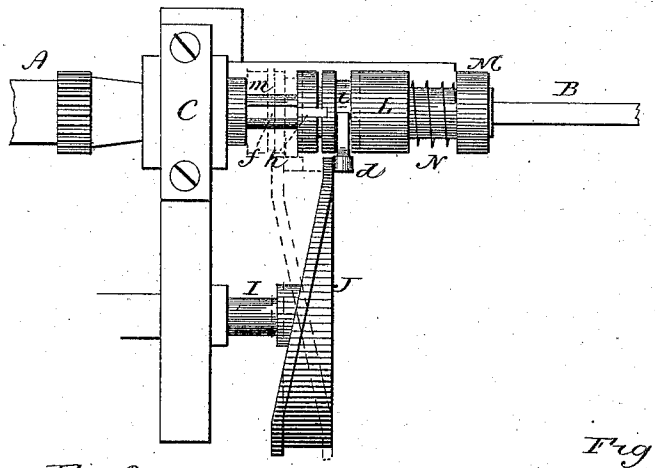


Fig. 3

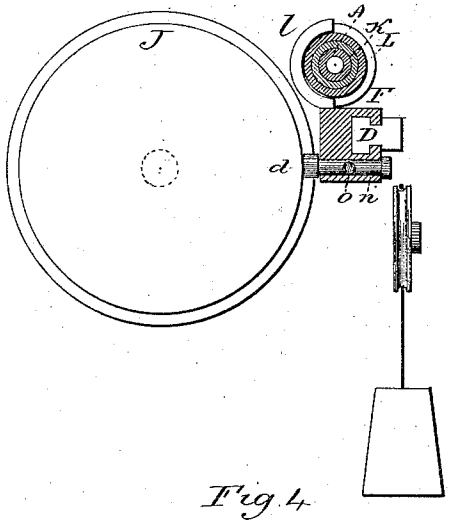


Fig. 2

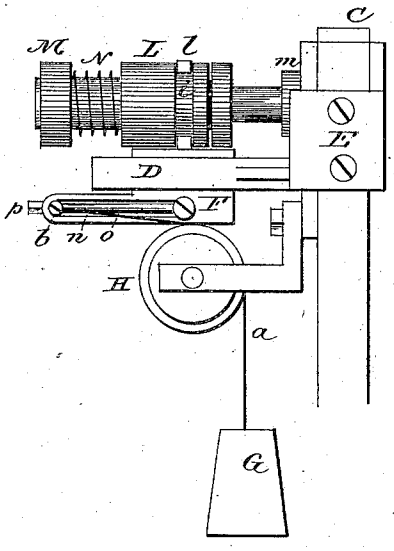
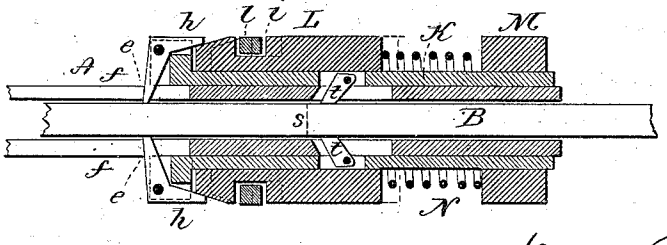


Fig. 4



Witnesses.
Jos. R. Shumway
Jos. C. Earle

Henry Reynolds.
Inventor
By atty
Wm. C. Earle

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HENRY REYNOLDS, OF NEW HAVEN, CONNECTICUT.

FEEDING DEVICE FOR SCREW-MACHINES.

SPECIFICATION forming part of Letters Patent No. 311,785, dated February 3, 1885.

Application filed May 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY REYNOLDS, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Feed for Screw-Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top or plan view; Fig. 2, a side view opposite the cam J; Fig. 3, a transverse section through the slide, looking toward the face of the cam; Fig. 4, a longitudinal section of the mandrel and sleeves enlarged.

This invention relates to an improvement in feed for that class of screw-machines in which the screws are made from a rod introduced through the mandrel, the first screw being made on the end of the rod, cut off, the rod then advanced, the second screw made, and so on. This class of machines are too well-known to require particular description.

As this invention is adapted to any machine in which a hollow mandrel is employed and through which the rod is to be fed, I therefore show only so much of the machine as will illustrate my invention.

The object of the invention is to apply a feed substantially independent of the mechanism of the machine, and which may be readily adjusted to different lengths of screws; and the invention consists in the construction as hereinafter described, and more particularly recited in the claims.

A represents the mandrel of any of the well-known screw-making machines of this class, and which carries at its forward end a chuck or other device which will grasp and hold the rod, so that it may partake of the revolution of the mandrel. This mandrel is hollow, and through it the rod B from which the screws are to be made is passed.

The feeding device is placed at any convenient point in the machine. As shown, it is at the extreme rear end, C, representing the rear bearing for the mandrel.

D is an arm which extends rearward from a bracket, E, fixed to the frame. This arm is substantially parallel with the mandrel. Upon this arm a slide, F, is arranged so as to move longitudinally thereon, the arm being constructed of T or other suitable shape to form guides for the movement of the slide F.

G is a weight from which a cord, *a*, extends over a pulley, H, rearward, and is attached to the slide F, as at *b*. The action of this weight is therefore to draw the slide forward or toward the machine.

On a shaft, I, arranged in suitable bearings, is a cam, J. This is a side cam, its face at the rear.

On the slide F is a stud, *d*, projecting therefrom and so as to stand in the path of the face of the cam, as seen in Figs. 1 and 3. This stud may carry an anti-friction roll against which the side face of the cam J will work, as seen in Fig. 1.

As seen in Fig. 1, the slide is at its extreme rear movement. Now, if from that point the cam revolve, the weight G will hold the stud *d* in contact with the face of the cam, so that in such revolution of the cam the stud *d* will follow the incline, as indicated in broken lines, Fig. 1, and as the cam returns the slide will be forced to correspondingly return to its extreme rear position. The mandrel A extends rearward, and upon it is a sleeve, K. (Seen enlarged in Fig. 4.) This sleeve is free for a certain amount of longitudinal movement upon the mandrel. At its forward end it carries two or more jaws, *e*, the noses of which extend through longitudinal slots *f* in the mandrel. These jaws are hinged at the forward end of the sleeve K, and are provided with a tail, *h*, extending rearward.

On the sleeve K is a second sleeve, L. This sleeve is free for longitudinal movement, and is constructed with an annular groove, *i*.

On the slide F is an arm, *l*, which extends into the groove *i*, so that the sleeve L may partake of the longitudinal movement of the slide imparted to it, as before mentioned. The forward end of the sleeve is of conical shape, so that it may be forced beneath the tails *h* of the jaws, as seen in Fig. 4, and when the forward end of the sleeve L is so forced between the tails *h* of the jaws, then the nose of the jaws grasps the rod E, as seen in Fig. 4.

On the sleeve K at the rear a collar, M, is

fixed, and between that collar and the rear end of the sleeve L is a spring, N, the tendency of which is to hold the sleeve forward, yet yield to a certain extent in its rear movement. In its extreme rear position, as seen in Fig. 4, the sleeve stands forward under the influence of the spring N, its forward end just beneath the tail *h* of the jaws, the slide being held by the cam J, as seen in Fig. 1. So soon as the cam J turns to bring its forward incline to the stud *d*, the slide F is permitted to move forward, the stud *d* following the face of the cam. In so doing the sleeve L is forced forward and its inclined forward end driven beneath the tails *h* of the jaws, so as to cause the jaws to forcibly grasp the rod B and carry the rod forward, with the jaws, to the extent of the forward movement of the slide F. Then, when this forward movement or feed has been made, the cam returns, the slide F raising the weight to the position seen in Fig. 2, ready for the next feed. The cam J may limit the forward movement of the slide, the stud *d* following the face of the cam; or this extent of feed may be limited by stopping the forward movement of the slide at any predetermined time. The forward movement of the slide may be limited by the extreme forward end of the sleeve K coming in contact with the end *m* of the bearing C, or any other suitable stationary stop. In this case the stud *d* is made adjustable, and, as here represented, this is done by arranging the stud in a slot, *n*, in the slide upon a leading-screw, *o*, so that by turning this leading-screw, which may be done by means of its head *p*, the stud may be moved along the slot rearward, and as the stud rests against the face of the cam it follows that such rear movement of the stud in the slot would permit the slide to move forward accordingly. If a shorter feed, therefore, be required, the stud is drawn rearward until the distance between the forward end of the sleeve L and the stop *m* is equal to the amount of feed required, or vice versa. After having fed the rod forward, as the slide returns, the first effect is to withdraw the sleeve L from beneath the tails of the jaws, as seen in broken lines, Fig. 4, which relieves the rod from the pressure of the jaws, and from the time of such relief the sleeves L and K move together to their extreme rear position. Then, in the next forward movement, the sleeve L first causes the jaws to grasp the rod, and then the jaws move with the sleeve L to produce the feed, as before described.

In screw-machines the feeding-cam J usually has an intermittent movement arranged to permit the feed at the proper time.

The feeding device which I have thus described is applicable to other machines in which an intermittent feed through a hollow mandrel is desirable—as, for instance, in machines for cutting wires to lengths. The illustration, however, which I have given of this feed will be sufficient to enable those skilled in the art to adapt it to such machines.

It will be understood that in place of the weight G a spring may be applied, or any other of the well-known equivalents for a weight.

While I prefer to apply a spring between the collar M and the rear end of the sleeve, the spring may be omitted and the collar arranged so near the sleeve that it will permit only the necessary longitudinal movement of the sleeve L to open and close the jaws. It will be understood that the spring yields only for the withdrawal of the sleeve L from beneath the tails of the jaws, and that when the jaws are free from their grasp upon the rod the jaw-carrying sleeve will move with the sleeve L. When the first rod has been used up to such an extent as to leave but a short portion of it back of the jaws *e*—say as at *s*—a second rod is introduced and butted against the first, and in order that this second rod may be fed forward, and thereby avoid the necessity of the attendant forcing it forward as the first rod advances, a second set of jaws, *t*, are hung in the sleeve K at the rear, through which the advancing rod will freely pass, which jaws will be carried back and forth by the sleeve K, as before described. These jaws are hung, as shown, so that they move backward freely, but in advancing will gripe upon the rod which may be introduced. Therefore, if the second rod be entered so that its end passes forward beyond the jaws *t*—say as to the point *s*—the jaws *t t* will engage that second rod when the sleeve K is next advanced and carry that rod with it, and so continue until this second rod in its turn shall be engaged by the principal feeding-jaws, *c c*, as before described, and from that time the second rod will feed the remainder of the first forward until it shall have been wrought into screws.

The second set of jaws, *t*, is not essential to the working of the feed, as the attendant may enter the second rod until it shall come within the grasp of the principal jaws, *e*. Then those jaws will carry the second rod forward against the first; but the second set of jaws are useful in that they save time of the attendant in watching the machine.

I claim—

1. The combination of a hollow mandrel arranged to receive a rod longitudinally through it, a sleeve on said mandrel arranged for longitudinal movement, carrying jaws arranged to extend through slots in said mandrel and so as to engage the rod therein, a second sleeve on said jaw-carrying sleeve, arranged for a certain longitudinal movement independent of the jaw-carrying sleeve, and constructed to close the jaws or permit their opening, according to the direction of its longitudinal movement, a slide parallel with said mandrel and connected, substantially as described, with said second sleeve, mechanism, substantially such as described, to impart a positive movement to said slide in one direction, and mechanism, substantially such as described, to impart movement to said slide in the opposite direc-

tion, but independent of the mechanism which imparted the first movement, substantially as specified.

2. The combination of the hollow mandrel A, the sleeve K, longitudinally thereon, jaws *e* in said sleeve and extending through slots in the mandrel, the sleeve L on said sleeve K, its one end constructed to pass beneath the tails of the jaws and so as to close the jaws or retreat therefrom to permit their opening, the slide F, arranged for longitudinal movement parallel with the mandrel and in connection with said sleeve L, the cam J, stud *d* on said slide, arranged to follow the face of the cam, and mechanism, substantially such as described, to bear said stud against the face of the cam, substantially as specified.

3. The combination of the hollow mandrel A, the sleeve K, carrying jaws *e*, the sleeve L on said sleeve K, arranged for a certain longitudinal movement independent of said sleeve K, and so as to close said jaws or permit their opening, the slide F in connection with said sleeve L, cam J, stud *d* on said slide F, and mechanism, substantially such as described, to hold the said stud against the face of the cam, said stud made adjustable on said slide, substantially as described.

4. The combination of the hollow mandrel A, sleeve K, jaws *e* arranged therein, sleeve L on said sleeve K, arranged for certain longitudinal movement independent of said sleeve K, whereby said jaws are closed or permitted to open, slide F in connection with said sleeve L, cam J, stud *d* on said slide, mechanism, substantially such as described, to bear said stud against the face of the cam, collar M, fixed to the sleeve K, and spring N, between said collar and the sleeve L, substantially as and for the purpose described.

5. The combination of the hollow mandrel A, the sleeve K, carrying one set of jaws, *e*, and also carrying a second set of jaws, *t*, in rear of the first set, the sleeve L on said sleeve K, arranged for certain longitudinal movement independent of said sleeve K, and so as to close said jaws *e* or permit their opening, the slide F in connection with said sleeve L, and mechanism, substantially such as described, to impart a forward and back movement to said slide, substantially as specified.

HENRY REYNOLDS.

Witnesses:
JOS. C. EARLE,
J. H. SHUMWAY.