F. P. SHELDON.

Machine for Threading Screws.

No. 203,560. Patented May 14, 1878.

Fig. 1.

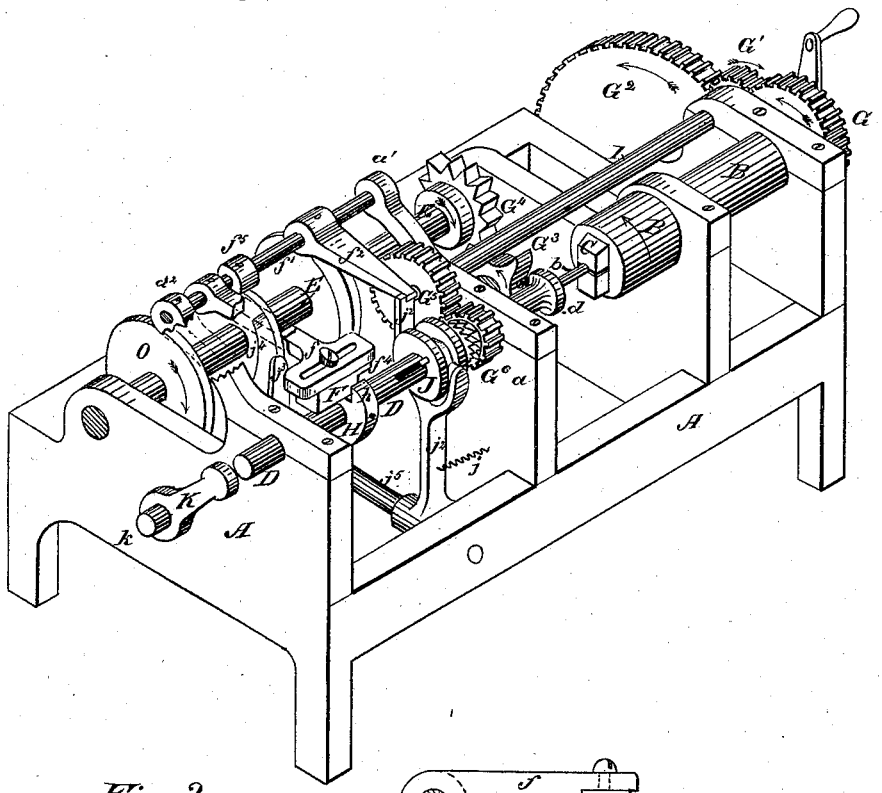
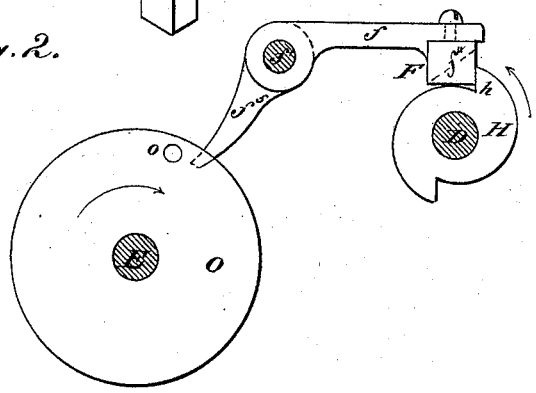


Fig. 2.



Attest:

D. G. Stuart

L. D. Hannay

Inventor:

F. P. Sheldon

by Wm. Callum

Atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK P. SHELDON, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR THREADING SCREWS.

Specification forming part of Letters Patent No. **203,560**, dated May 14, 1878; application filed April 16, 1877.

To all whom it may concern:

Be it known that I, FRANK P. SHELDON, of Providence, in the State of Rhode Island, have made certain new and useful Improvements in Machines for Threading Screws; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a view of my improved machine in perspective. Fig. 2 shows detached parts of same.

My invention relates to that class of screw-threading machines in which the thread is cut by a solid die, and is designed to relieve the machine from the wear and damage resulting thereto from the constant reversing of its parts.

In the drawing, A is the frame of the machine, and B a mandrel containing the griping-jaws C, which are opened and closed by any desired mechanism. D is a die-arbor, which holds a threading-die, *d*. E is a cam-shaft, to which motion is communicated by a train of gears, G G^1 G^2 G^3 G^4, and is provided with suitable cams for operating the several parts of the machine, as hereinafter described.

The gears G^3 and G^4 are what are known as "star gears," and give to the cam-shaft an intermittent motion. The speed of the cam-shaft may, however, be reduced by any other desired mechanism, and its rotation adapted to the length of screw to be threaded.

G^6 is a gear having an elongated hub surrounding the die-arbor D and extending through the standard *a*, which serves as a journal. The gear G^6 receives a continuous rotary motion from the gear G^5 through the shaft I and gears G and G^1, and moves loosely around the die-arbor D, except when locked with the clutch J. The mandrel B and the gear G^6 rotate continuously in the same direction, but not at the same rate of speed.

J is a sliding clutch, secured to the die-arbor D by a key moving in a longitudinal slot. The adjacent faces of the clutch J and the gear G^6 are provided with teeth or clutch-pins.

The die-arbor D remains stationary during the threading of the screw; but upon the completion of that operation the clutch J engages the gear G^6, which causes the die-arbor D to rotate in the same direction as the screw-blank, and at a much greater speed. The die-arbor D is prevented from rotating during the cutting of the thread by a pawl, F, which engages the collar H, attached to said arbor, the pawl and collar both being adjustable—the one by a screw passing through a slot in the lever *f*, and the other by an ordinary set-screw. The pawl F is connected, by a lever, *f*, to a rock-shaft, f^1, supported in suitable bearings a^1 a^2. f^2 is another lever secured to the rock-shaft f^1, and engages the lever j^2, and through it controls the lateral movement of the clutch J.

The under side of the pawl F is provided at one end with an inclined face, f^4, with which the point *h* of the collar H comes in contact and pries up the levers *f* and f^2, disengaging the latter from the lever j^2.

Having now described the several parts of my improved machine, I will now proceed to describe its operation.

Commencing with the parts in the position shown in Fig. 1, a screw-blank, *b*, is placed within the jaws C by any desired feeding mechanism. The die-arbor D is stationary, and the mandrel B, which holds the griping-jaws C, continuing to rotate, operates, through the gears G, G^1, G^2, G^3, and G^4, a cam upon the cam-shaft E, and releases a lever attached to the rod *k*. The rod *k*, being thus released, is moved forward longitudinally by a spring, and the arm K, attached to its outer extremity, comes in contact with and moves forward the die-arbor D until the threading-die *d* engages the already-rotating screw-blank *b*. As soon as the screw-blank enters the die it will, by its rotation, draw the die upon itself. The die-arbor D continues to advance until the thread has been cut upon the blank the desired distance and the point *h* of the collar H has passed beyond the vertical face of the pawl F. The die-arbor D, now commencing to turn, by reason of the friction of the blank in the die, causes the point *h* of the collar H to strike against the inclined face f^4 of the pawl F and raise the lever *f*. This lever *f*, through the rock-shaft f^1, raises the lever f^2 and releases the lever j^2, when the clutch J, actuated by the spring *j* through the lever j^2, will slide upon the die-arbor D and lock with the gear G^6. The die-arbor D will now begin to rotate in the same direction with the mandrel B, but

at a greater rate of speed. Although turning in the same direction, the increased speed of the die-arbor will unscrew the die *d* from the threaded screw and recede to its former position. During the backward or outward movement of the die-arbor D the lever f^2 will rest upon the top of the lever j^2, and, through the rock-shaft f^1 and lever *f*, will hold the pawl F in a position sufficiently elevated to permit the rotation of the collar H. As soon as the screw is in this manner withdrawn from the die a cam, j^4, on the cam-shaft E operates upon the lever j^3, and, through the rock-shaft j^5 and lever j^2, unlocks the clutch J from the gear G^6 and carries it to its former position. At the same time the lever f^2 will fall into the notch in the end of the lever j^2, and hold the clutch J in the position to which it has been removed. The pawl F, receiving its action from the rock-shaft f^1, will fall and engage the collar H, and restrain the further rotation of the die-arbor D during the threading of the next blank.

A new blank having now been fed to the griping-jaws C, the same operation is repeated.

It not unfrequently happens that, by reason of the slipping or turning of the blank, the die fails to advance the requisite distance to cut the thread, and consequently to bring into operation the mechanism for releasing the die in time for the feeding of a fresh blank. In order to overcome this difficulty whenever it occurs, I provide my improved machine, in addition to the adjustable features herein described, with a positive motion, which shall, in the event of such failure only, regulate the release and retreat of the die.

In the drawing, Fig. 2, f^5 is a lever secured to the rock-shaft f^1, before mentioned, the end of which lies in the orbit of a pin, *o*, attached to the disk O upon the cam-shaft E.

The pin *o* is so adjusted that, in case the pawl F and lever f^2 operate as hereinbefore described, the lever *f* will be raised and the lever f^5 depressed before the pin *o* reaches the lever f^5, so that it will not come in contact with, but pass under, it. If, however, the die should fail to advance upon the blank the requisite distance to operate the pawl F and lever f^2 in the manner described, the pin *o* will depress the lever f^5 and raise the lever *f*, the pawl F, and the lever f^2, in the same manner and with the same result as they should have been operated by the collar H.

I do not limit myself to the particular form of the adjustable mechanism shown, as the same may be subject to many variations while the same principle is retained.

What I claim for my invention, and desire to secure by Letters Patent, is—

1. The mechanism, substantially as described, for holding the die-arbor from rotating while cutting the thread, and for releasing it from the holder at any desired time, and for effecting connection between the die-arbor and the source of rotation immediately consequent upon such release, consisting, essentially, of the adjustable stop F, the collar H, the latch f^2, shaft f^1, arm *f*, spring *j*, and lever j^2, in combination with clutch J and gear G^6, rotating in the same direction as the screw, but at a greater speed, substantially as set forth.

2. The combination of die-arbor D, clutch J, gear G^6, adjustable stop F, collar H, latch f^2, arm f^5, shaft f^1, rotating cam-pin *o*, lever j^2, and spring *j*, substantially as set forth.

F. P. SHELDON.

Witnesses:
W. S. GRANGER,
WALTER B. VINCENT.