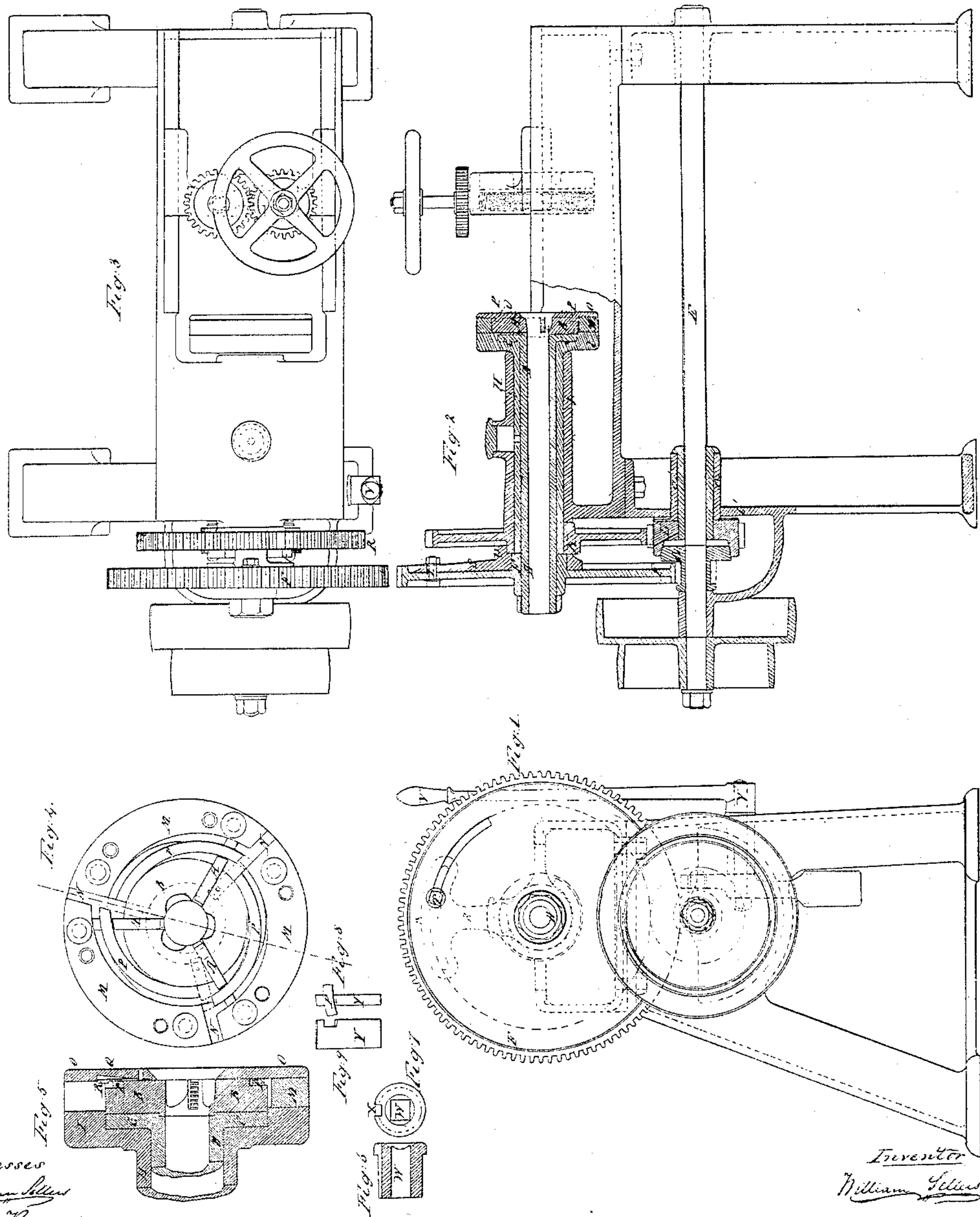


W. SELLERS.  
BOLT CUTTER.

No. 18,775.

Patented Dec. 1, 1857.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR THREADING BOLTS.

Specification forming part of Letters Patent No. 18,775, dated December 1, 1857; Reissued February 8, 1859, No. 656.

*To all whom it may concern:*

Be it known that I, WILLIAM SELLERS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in the Method of Holding and Operating the Dies and Holding the Tap in Bolt-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, in which—

Figure 1 is an end view. Fig. 2 is a vertical section through the center of the spindle, and Fig. 3 is a plan of the whole machine. Fig. 4 is a plan of the die holder and cam box with the cover removed. Fig. 5 is a vertical section of the cam box. Fig. 6 is a section through the center of the tap holder. Fig. 7 is an end view of the tap holder. Fig. 8 is an edge view of key for tap holder and Fig. 9 is a side view of same.

The object of my invention is to avoid the necessity of reversing the motion of the cutting dies or of stopping the machine to change the bolts and to so arrange the die and tap holder as to admit of greater facility in changing from one size thread to another or to tapping nuts. To this end I place the dies A, A, A, in a cylindrical piece of metal B, which I call the die box and which is provided with radial grooves of such size as to receive the dies and allow them to slide freely in a radial direction. The die box B is securely attached to the face plate C of the hollow spindle D which carries the spur wheel F that receives motion from the pulley shaft E by means of the pinion G. Surrounding and sustaining the spindle D I place another hollow spindle H having a face plate or flanch I at one end. This spindle H is bolted to, and is supported by the tubular piece J of the frame. On the face plate I there are three eccentric cams M, M, M, of equal eccentricity. They are securely bolted to the face plate leaving spaces N, N, N, between them of sufficient width to admit the dies A, A, A, to pass freely. On the outer surface of the cams M, M, M, I bolt a covering plate O having on its inner surface three cams P, P, P, parallel with the cams M, M, M, and three springs Q, Q, Q, which springs are so placed as to

form one side of the openings N, N, N, through which the dies are inserted and having also projections R, R, R, which form a continuation of the cams P, P, P. These springs are for the purpose of keeping the dies from sliding out of the openings N, N, N, whenever the dies are opened for the purpose of removing the bolt and also to govern the position of the dies when first entered so as to guide them upon the cams P, P, P. The face plate I, cams M, M, M, and cover O, with its cams P, P, P, I call the cam box. On the wheel F and moving freely a suitable distance around the hub thereof I provide an adjustable stop S, which may be securely attached to the wheel F by means of the bolt T and having near its center a projection U which is of such length as to come in contact with a similar projection on the wheel K, thereby conveying motion to the wheel K and spindle H from the pulley shaft E.

To put the machine in operation it is necessary first to move the die box B into such a position that the grooves to receive the dies shall correspond with the openings N, N, N, between the cams M, M, M. Into these openings the dies are then inserted and pushed forward until the projection R on the spring Q falls into an opening in the edge of the die which is made to receive one of the cams P, which cams are for the purpose of withdrawing the die from the center. The dies now being in the die holder the next operation will be to adjust them to the size of the bolt to be cut; this is accomplished by slacking the set bolt T on the adjustable stop S and then moving the die box B by means of the pulley shaft E pinion G and wheel F, the wheel K with the cams M, M, M, being held stationary as this is done, the dies A, A, A, will be gradually forced by the cams M, M, M, toward their common center and closed upon any finished bolt or other object to which it may be desired to set them. While the wheels are in this position the adjustable stop S is moved so as to bring the projection U near its center in contact with a similar projection on the wheel K when the set bolt T may be secured. If now the wheel F be turned in the same direction as before it will carry with it the wheel K and cams M, M, M, and as the dies A, A, A, and cams M, M, M, will



be then moving in the same direction and at the same velocity there will be no farther movement of the dies in a radial direction.

To open the dies for the purpose of withdrawing the bolt, the pulley shaft E being in motion, the pinion L must be moved by means of the loose collar  $\alpha'$  and handle V so as to tighten the friction clutch G L which will give an equal velocity to the two pinions G and L, but as the pinion L is larger than the pinion G the wheel K which is driven by L will move faster than the wheel F which is driven by G thereby causing the cam box to move around the dies in the opposite direction to that first described and the cams P, P, P, will force the dies from the center.

To close the dies preparatory to or during the operation of cutting the bolt the pulley shaft E being in motion the pinion L is forced by means of the loose collar  $\alpha'$  and handle V against the leg  $l'$ , which is here covered by a piece of leather so as to create friction, this will cause the pinion to stop, together with the wheel K and cams M, M, M, the motion of the wheel F and die box B will however continue, thus causing the dies A, A, A, to revolve as first described, thereby closing the dies until the projection on the stop S comes in contact with the similar projection on the wheel K compelling it to move at the same velocity when no farther movement of the dies in a radial direction will take place.

The cutting edge of the dies may be formed so as to cut a full thread by once passing over the bolt. This is accomplished by first cutting a thread in the dies perfectly straight and cylindrical and of such size as to fit the bolt when it has the thread cut upon it, the tops of the threads in the dies are then dressed off commencing at the base of the thread where the bolt is entered and terminating at the top of the thread about four threads from the point of entrance, they are at the same time to be dressed back from the cutting edge so as to give a clearance, each thread of the dies will thus

form a cutting edge and the thread upon the bolt will be formed by a series of cuts, each one deeper than its predecessor, until the perfect thread is developed.

To fit the machine for tapping nuts I provide a cylindrical piece of metal W which is turned to fit accurately in the hollow spindle D and die box B, having a square hole through its center to receive the shank of the tap; in its outer surface I cut a square recess X of the same width as the grooves in the die box B which receives the dies A, A, A. Having removed the dies I insert in the place of one of them a piece of metal Y of the same shape and size as the die having the end nearest the center of the die box made square so as to fit in the recess X of the cylindrical piece W and which serves as a key to prevent the piece W from turning in its place, the piece Y being forced into the recess X by the operation of the cam M as described in the process for cutting bolts. The square shank of the tap is slipped into the hole of the same shape in the piece W and the nut to be operated upon by the tap may be held by any of the numerous devices now in use for that purpose.

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

1. The use of a die box and cams substantially as described, when these are arranged as to be capable of revolving about a common center at different velocities for the purposes of opening and closing the dies.

2. I claim arranging the cams so as to leave open spaces between them, substantially as described, in combination with the die box and dies as described, to facilitate the changing of the dies.

3. I also claim the mode of attaching the tap holder to the revolving die box substantially as described.

WILLIAM SELLERS.

Witnesses:

COLEMAN SELLERS,  
THEODORE BERGNER.