E. Kaylor, 2 Sheets Sheet 1.

Screw Cutting.

No. 106,592 Patented Aug. 23, 1870

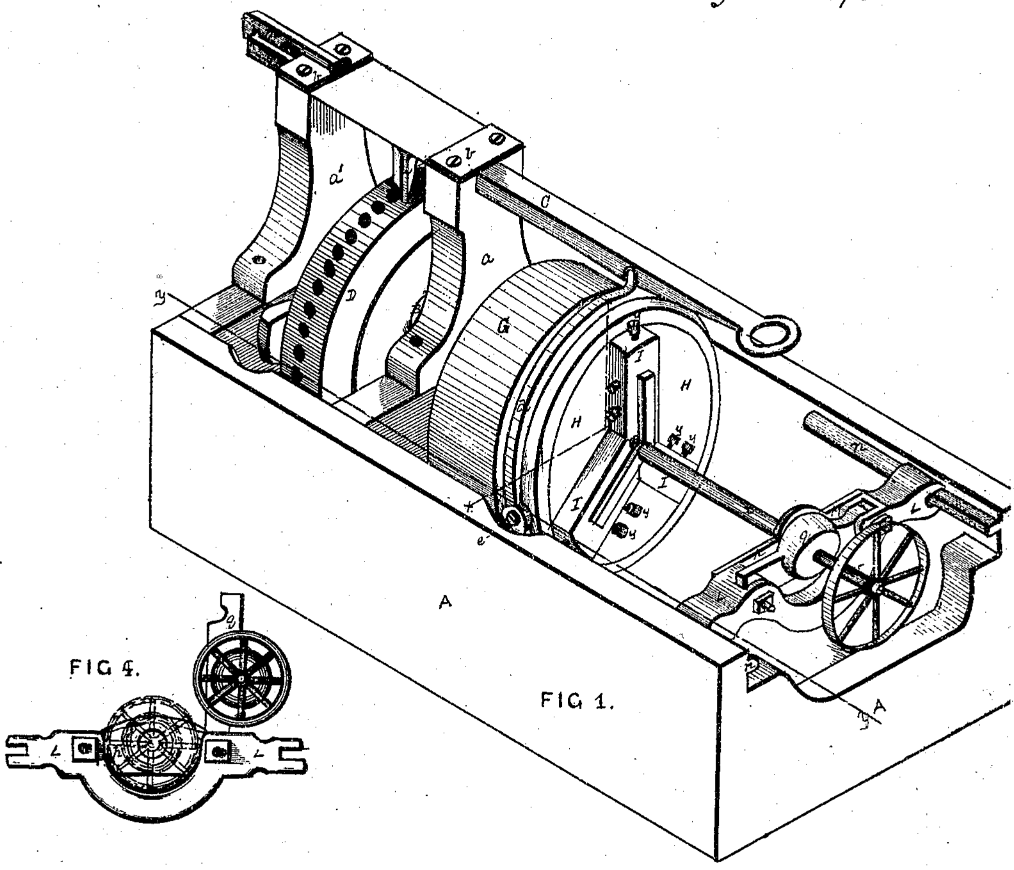

FIG 4.

FIG 1.

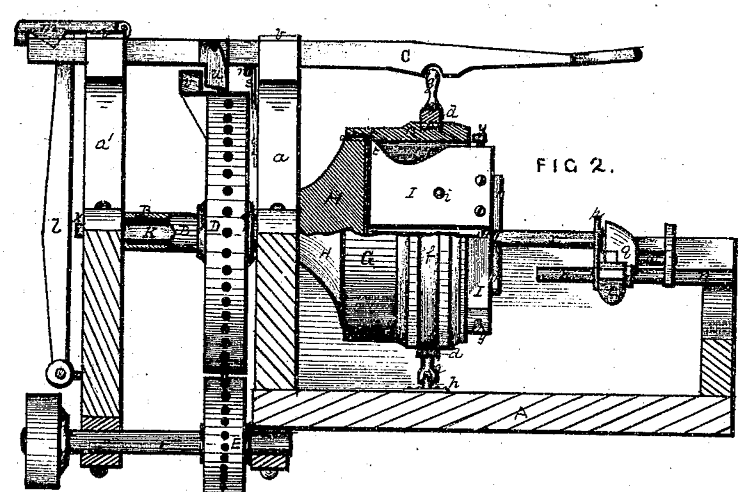

FIG 2.

Inventor:
Eedward Kaylor
by Bakewell Christy
his Attys.

Witnesses
Thos B Kerr
R.C. Mcrenshall

2 Sheets, Sheet 2.

E. Kaylor,

Screw Cutting.

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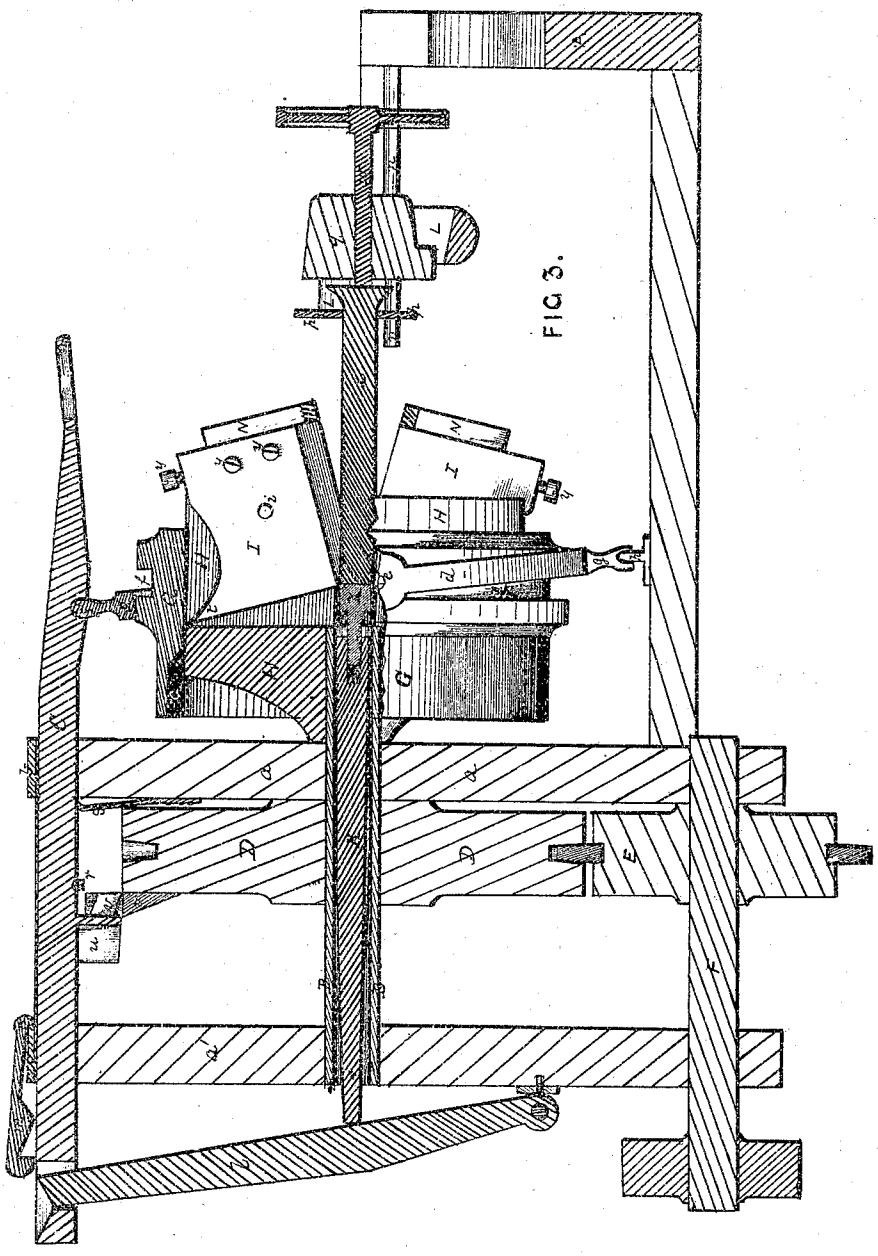

FIG 3.

Witnesses:

Thos Bakewell
R. L. Marshall

Inventor:

Edward Kaylor,
by Bakewell & Christy
his Attys.

United States Patent Office.

EDWARD KAYLOR, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 106,592, *dated August* 23, 1870.

IMPROVEMENT IN SCREW-CUTTING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EDWARD KAYLOR, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Screw-cutting Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, in two sheets, making part of this specification, in which—

Figure 1 is a perspective representation of my improved screw-cutting machine, with the parts in working operation, and a bolt inserted to be operated upon.

Figure 2 is a longitudinal vertical section through the machine on the line *y y*, fig. 1, with a portion represented by dotted lines *x x*, fig. 1, removed from the socket and die-head.

Figure 3 is a longitudinal vertical section through the center of the machine.

Figure 4 is a representation of the sliding frame, which holds the bolt to be threaded in place, as it is fed by the rotation of the dies and die-holder.

My invention relates to the construction of that class of machines for cutting screw-threads on bolts, &c., wherein the dies, when closed and in operation, are surrounded by a socket, so as to be held firmly to their work until the screw is cut of the desired length, and then automatically opened, so as to release the screw-bolt and permit of its rapid withdrawal, without the necessity of reversing the motion of the dies or unscrewing the bolt from the dies.

To enable others skilled in the art to use my improved machine, I will proceed to describe its construction and operation.

In the several figures like letters of reference denote similar parts.

A is the frame of the machine, made of any desired shape, which will conveniently hold the several parts.

A hollow cylindrical and horizontal shaft B is placed in suitable bearings in the pillar-blocks *a a'*, which pillar-blocks rise up above the level of the shaft and support the shifting-bar C, which slides in grooves the top of the pillar-blocks, being kept in place by the caps *b b*.

On the cylindrical shaft B, between the pillar-blocks *a a'*, is keyed the gear-wheel D, which is revolved by a pinion, E, on the driving-shaft F.

G is the socket which receives the die-head H, as hereinafter described, the socket being a metallic annulus, the cavity of which is exactly cylindrical, excepting that at the rear end are recesses *c c c* in the inner face of the ring, of sufficient depth to receive the projecting tails *t t t* of the die-holders when the dies are closed to their work, as will be explained in connection with the construction of the die-holder.

The socket G is placed so as to be concentric with the hollow shaft B, and is pivoted on each side at *e e* to a gimbal or ring, *d*.

The pivots *e e*, on which the socket is hung, are not screwed into the socket G, but enter a groove, *f*, externally surrounding the socket, whereby the socket is not only pivoted to the ring *d*, but may be made to rotate on its axis, within it.

The gimbal or ring *d* is supported below in the frame of the machine by a forked projection, *g*, which engages a small flange, *h*, on the bed of the machine, and above by a projection, *g'*, which enters a notch in the under side of the shifting bar C.

The two pivots *e e* are at the extremities of the horizontal diameter, and the projections *g g'* at the extremities of the vertical diameter of the socket G.

Fig. 3 represents the die-head H, which is a metallic frame, the exterior outline of which is cylindrical, of same diameter, and fitting closely into the cavity of the socket G.

The die-head H has three recesses deep enough to receive the three die-holders, I I I, which meet in the center or axial line of the die-head, in which lines, at the rear end of the die H, is a cylindrical hole, tapped with a screw-thread, by which it is screwed onto the forward extremity of the cylindrical shaft B, which enters the socket G for that purpose.

When the die-head is placed inside of the socket G it fits snugly in it, but cannot turn round therein, owing to the tails *t* of the die-holders I entering the recesses *c c c* of the socket, as before stated, so that, to screw the die-head on the shaft B, the socket is turned round with the die-head H.

The die-holders I are made to fit in the recesses in the die-head H, to which they are pivoted by a pin, *i*, at a point below the cutting-edges of the screw-dies, so that, when thrown back, the dies are opened, and take no hold of the rod placed in them, but when closed they are in a position to operate in screw-cutting.

When the die-holders I are closed, the tail-piece *t* of each die-holder I projects out beyond the outline of the die-head H into its recess *c*, and the upper end of the die-holder is flush with the edge of the die-head; but when the dies are open the tail-pieces *t* of the die-holders I are withdrawn within the head H, and the upper end of the die-holders projects beyond the circumference of the head.

By this arrangement, in connection with the sliding of the socket G forward or backward on the head H, the opening and closing of the dies is accomplished. As the head H is screwed onto the shaft B it revolves with it, but has no motion backward or forward, but

the socket G may be moved on the head H by means of the shifting bar C. When the socket G is moved forward on the head H as far as it will go, it closes the dies, the recesses C allowing the tail-pieces *t* of the die-holders I to project outward, and the socket hugging the upper end of the dies and the die-head so closely as to keep the dies closed as rigidly as if they were not movable; when, however, the socket is slipped a little back on the head H by the shifting bar, the dies are opened, the tail-pieces *t* being forced inward and the upper end of the die-holders allowed to pass outward.

The dies N N N, for cutting the screw-threads, are made in the usual way, and set in the die-holders I, and adjustably secured thereto with set-screws *y y*, in the ordinary manner, as shown in fig. 1.

The shaft B, which carries the die-head H, is made hollow to receive the mandrel K, which operates the tripping arrangement to effect the opening of the dies, by withdrawing the socket G when the screw is cut long enough on the bolt.

The mandrel K may be lengthened or shortened by means of the adjustable piece *k*, which forms the forward end of the mandrel, and which enters the central space in the die-head H, into which the bolt passes while being threaded, so that, when the screw is cut on the bolt to the required length, the end of the bolt touches the adjustable end-piece *k* of the mandrel K, and causes the dies to open and release the bolt from their bite. Therefore, by adjusting the length of the mandrel K by means of the end-piece *k*, the length of the screw to be cut by the machine is regulated with the greatest exactness.

This release of the bolt from the bite of the dies is effected by the mandrel K, which, when touched and pressed back by the end of the bolt, comes in contact with and pushes back the vertical lever *l*, which is pivoted at its lower extremity to the frame of the machine, while its upper end enters a slot in the outer extremity of the shifting bar C.

The upper end of the lever *l* is beveled, so as, when pressed back, to raise the latch *m*, which is hinged to the top of the rear pillar-block *a'*, and the hooked end of which engages the end of the shifting bar C, and keeps it pressed forward; when the shifting bar is in this position (the latch *m* being set) the gimbal or ring *d* is pressed forward, and the socket G is forced up on the die-head H, so as to close and hold fast the dies.

As soon, however, as the mandrel K touches the lever *l*, the latch *m* is raised and releases the shifting bar C, which is pressed a little backward by the spring *s* on the pillar-block *a*, bearing against the pin *r* on the shifting bar.

On the shifting bar C is a beveled projection, *u*, which reaches downward over the gear-wheel D, not quite touching it, and on one side of the gear-wheel D is a corresponding beveled projection, *v*, reaching upward, so as to engage the projection *u* of the shifting bar; when the latch *m* is caught on the end of the shifting bar, holding it forward, the plane surfaces of the two projections *u* and *v* pass each other without interfering, but as soon as the shifting bar is pressed a little back by the spring *s*, on releasing the latch *m* the knife-edges of the beveled projections *n* and *v* meet on their beveled faces, and, as they pass each other, they force the shifting bar back sufficiently to draw the socket G on the die-head H, which as before stated, opens the dies and frees the bolt on which the screw is being cut, which can be immediately withdrawn.

The bolt to be operated upon is secured in a sliding frame, L, in such a manner as to be in the axial line of the die-head H. This sliding frame L may be made in any convenient manner, so as to hold the bolt firmly, and slides freely on horizontal ways *n n* on opposite sides of the frame of the machine.

In the sliding frame L is bolted a plate, *p*, having a hole, *o*, (see fig. 4,) of sufficient size to receive the shank of the bolt, but not allow the head to pass through.

In front of and parallel to this plate is pivoted an arm, *q*, which shuts down against the head of the bolt, and a set-screw, *w*, in the arm *q*, is screwed down on to the head of the bolt, which holds it rigidly in position.

The operation of my machine is as follows:

The bolt *x*, to be threaded, being set, as just described, in the frame L, the shifting bar C being drawn forward so as to draw the socket G over the die-head H, close the dies, and the latch *m* being set, the frame L is pushed forward until the bolt *x* enters the bite of the dies N N N.

As the die-head H revolves with the shaft B, a screw is cut on the bolt, which is drawn in between the dies by their action in cutting. This operation continues until the end of the bolt *x* touches the forward extremity *k* of the mandrel K, and presses it back until it touches the lever *l*, which raises the latch *m* and releases the shifting bar C.

The beveled projections *u* and *v*, in the bar C and gear-wheel D then interfere and push back the shifting bar C far enough to withdraw the socket G and open the dies N N N.

The threaded bolt *x* being then free, the sliding frame is then drawn back and the bolt *x* removed, and another bolt inserted in its place.

Having thus described my machine,

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

1. The form of construction, herein described and shown, of the inner surface of the sliding socket G, and of the upper edge of the pivoted holders I, and the arrangement of them in relation to each other and to the die-head H, in virtue of which the dies are opened on retracting the socket, and forced toward each other and held firmly in position on the forward movement of the socket, substantially as set forth.

2. The combination, with the mandrel K, dies, die-holder, and socket G, of the ring *d*, supported below on flange *h*, pivoted at the middle to the socket G, and connected at the top with the bar C, or its equivalent, through the medium of which, and other suitable mechanism, the force exerted by the bolt-blank on mandrel K is communicated to said ring and socket, substantially as described.

3. The socket for inclosing the die-holders, and the ring *d*, in combination with shifting bar C, mandrel K, lever L, and beveled projections *u v*, substantially as set forth.

In testimony whereof, I, the said EDWARD KAYLOR, have hereunto set my hand.

EDWARD KAYLOR.

Witnesses:

A. S. NICHOLSON,

THOS. B. KERR.