L. W. Langdon.

Cutting Screws.

No. 45,054. Patented Nov. 15, 1864.

Fig. 1.

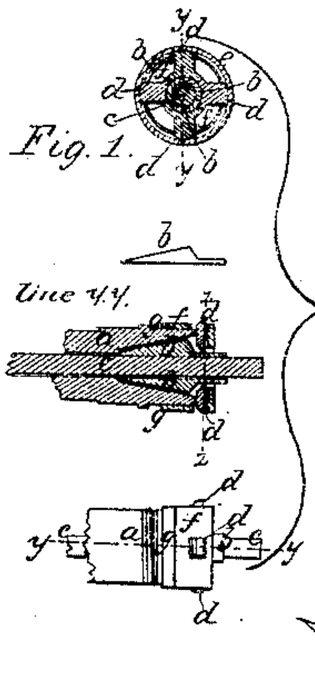

Fig. 4.

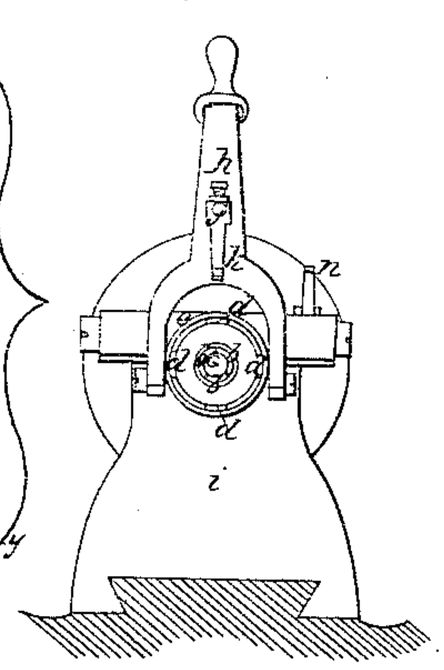

Fig. 5.

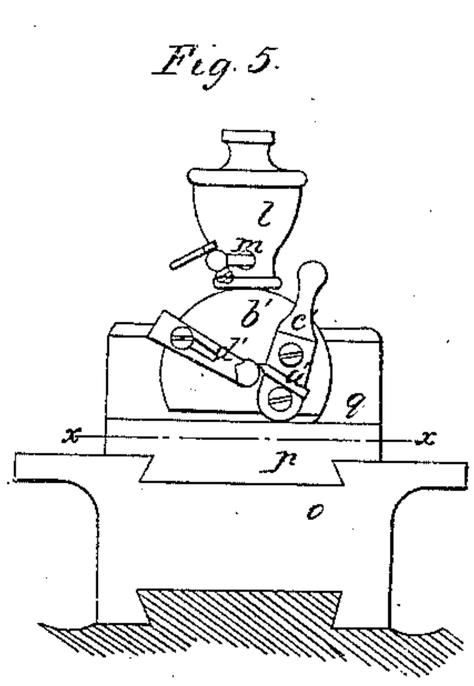

Fig. 6.

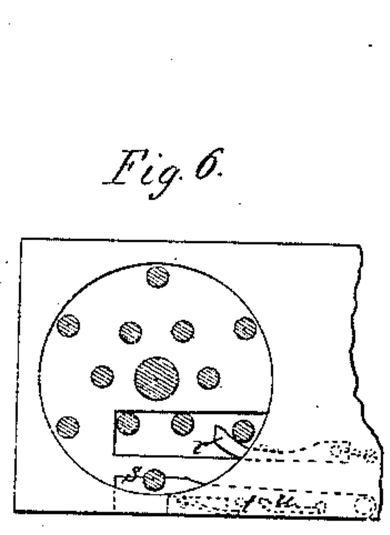

Fig. 2.

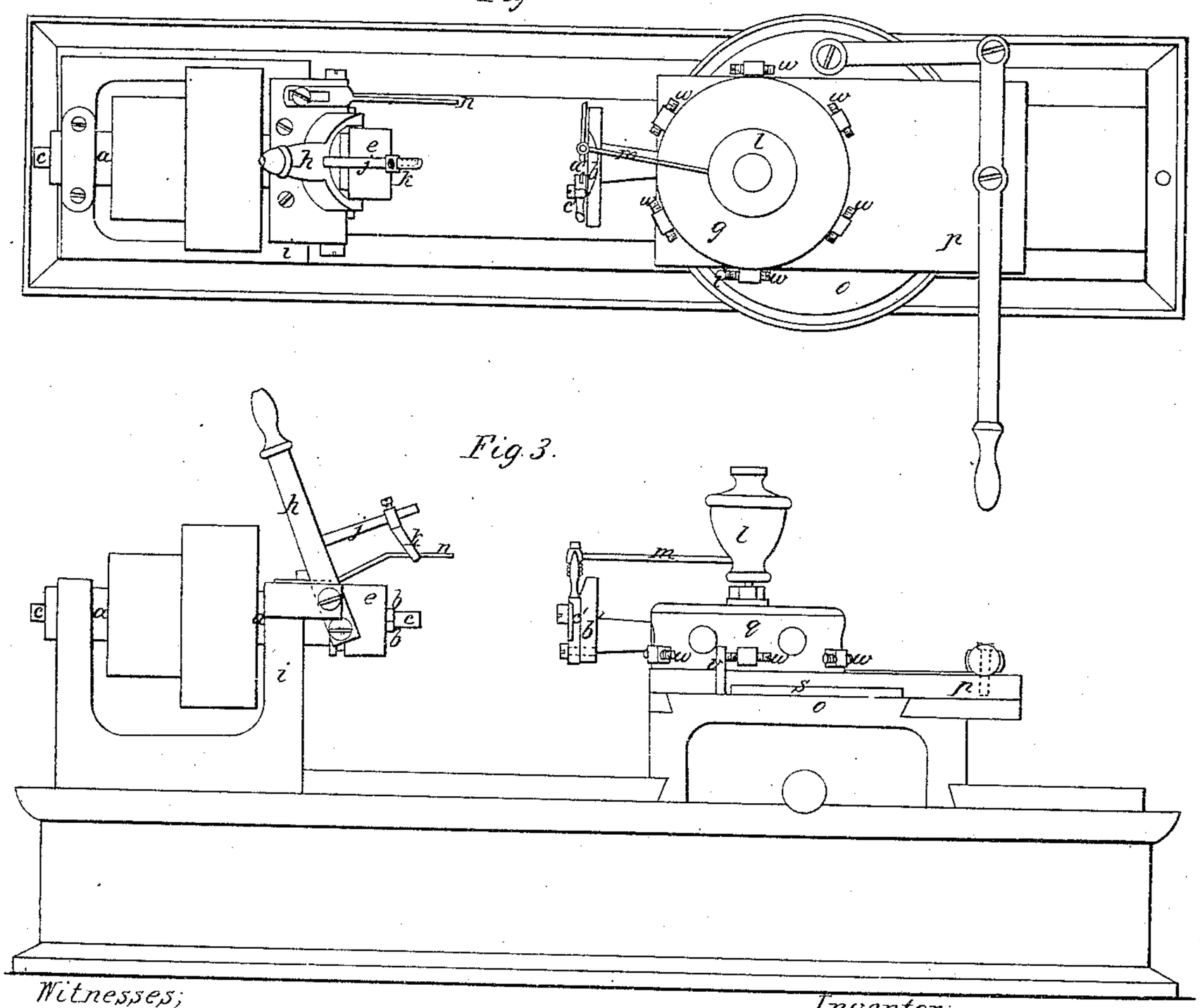

Fig. 3.

Witnesses;
F. Gould
J. B. Tidden

Inventor;
L. W. Langdon
By his Atty W. B. Crosby

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

L. W. LANGDON, OF NORTHAMPTON, MASSACHUSETTS.

IMPROVEMENT IN SCREW-CUTTING MACHINES.

Specification forming part of Letters Patent No. **45,054**, dated November 15, 1864.

To all whom it may concern:

Be it known that I, L. W. LANGDON, of Northampton, in the county of Hampshire and State of Massachusetts, have invented Improvements in Screw-Cutting Machines; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to sundry details of construction in machines designed for making screws such as are used in gun-locks, sewing-machines, and elsewhere in mechanism generally; and it consists, first, in a peculiar construction of chuck by which the rod from which the screws are formed is centered and firmly held in any desired position, and is easily released from the grasp of the chuck, said construction rendering it as easy to perform such operations while the mandrel of the machine is in rotation as when it is still.

In the drawings, which are inclosed in a bracket and all embraced under the head of Figure 1, may be found illustrations of this part of my invention. In this figure may be seen a plan, a longitudinal, and a cross section showing the chuck, its parts, and construction.

a is the hollow mandrel, the bore of which is at the end presented to the tail-stock enlarged conically, so as to receive the pieces marked *b*, one of which is shown in detail detached from its connection with the other parts. Three or more of these are used together, and are the pieces which come into contact with rod *c* to hold it, which is done by forcing pieces *b* into the conical cavity in *a*. To accomplish this movement the pieces *d* are driven toward the center of *a* by sliding forward the sleeve *e*, which is conical in the bore, and slips over the incline made on the outer ends of *d*. The inner ends of *d* being also inclined, as shown, and, meeting an incline formed on *b*, forces *b* into *a*, and thus makes the pieces *b* pinch the rod *c*. When the sleeve *e* is slid in the other direction, centrifugal force, when the mandrel *a* is rotating, causes pieces *d* to move outward as far as permitted by their construction, and this leaves the parts *b* and rod free from stress.

f is a screw-sleeve, which serves conveniently for the attachment and change of pieces *d*, and *g* is a check-nut to hold *f* in any desired position. This chuck is further seen in Fig. 2, which is a plan of the entire machine embodying the various parts of my invention; also, in Fig. 3, which is a front elevation of the machine seen in Fig. 2; also, in Fig. 4, which is an end view of the head-stock in which the mandrel *a* rotates.

Another part of my invention consists in combining with the means by which the chuck is made to grip the rod *c* a gage by which the length of protrusion of *c* from the chuck is regulated. This is seen in Figs. 2, 3, and 4.

h is a lever pivoted to the head-stock *i*, and gearing in the customary way into the sleeve *e*, so that vibration of the lever causes reciprocation of the sleeve. An arm, *j*, extends from lever *h*, as shown, on which a gage, *k*, is so placed as to be capable of sliding thereon and of being clamped in any desired position.

It will be obvious that when lever *h* is vibrated, as indicated by an arrow, that *k* will be thrown down across the extension of the axis of *a*, so that before the rod *c* is clamped in the chuck its end will abut against gage *k*.

Means for economizing the quantity of lubricating-fluid used upon the cutting-tools by making its flow intermittent and confining it to such times as the tools are actually cutting may be employed as follows:

l is the receptacle for oil or other lubricator, from which a pipe, *m*, extends a suitable distance to bring its delivery over the place where the tool is cutting. In this pipe there is a valve made to close automatically by a spring or otherwise, which valve is opened as the tail-stock bearing the tool is brought forward by the contact of the lever or handle of the valve with any suitable stop or incline—as, for example, the piece *n*, which is shown as adjustable so as to cause the valve to open at any desired point of the forward movement of the tail-stock.

The lubricator-reservoir and parts immediately therewith connected are shown in Fig. 5, which is an end view of the tail-stock, and also, together with the piece *n*, in Figs. 2 and 3.

The tail-stock is made up of three principal parts. One is the carriage *o*, arranged so that it can be slid on the bed-plate way, and there fixed in position as desired. This carriage has in its upper surface a dovetail groove fitted to receive the slide *p*, which can be reciprocated

by working the levers seen in the plan, Fig. 2. The third part consists of a rotating tool-holder, *q*, which is pivoted on slide *p* and moves with it.

The part *o* is clamped in position on the bed with reference to the work to be peformed, and then by its lever the slide *p* and tool-holder *q*, provided with suitable tools, are advanced toward the headstock to the work. In withdrawing the slide and tool-holder the latter is rotated so as to present in the next forward movement of the slide another tool to operate on the work, and in the mechanism by which this rotation is accomplished may be found another part of my invention. The tool holder has fixed in the part resting on the slide two series of pins, arranged in two circles concentric with the axis of rotation of the tool-holder. The length of the outer row of pins is less than that of the inner row, so that in rotation they may pass over the swing-piece *r*, (seen in Fig. 6,) which is a section taken horizontally in the plane of the line *x x* seen in Fig. 5, and showing the slide in plan beneath. The number of pins in each circle corresponds with the number of socket-holes for tools in the holder, and the pins are arranged as shown in Fig. 6. Those in the inner circle are brought into contact in the backward movement of the slide from the work with the swing-piece *r*, which is pivoted on the carriage *o*, and with said swing-piece and the movement of the slide cause rotary movement of the tool-holder.

The pins in the outer circle, together with a latch, *s*, which is pivoted to the slide, form the means for locking the tool-holder and preventing it from rotating in its forward movement. In drawing back the slide there is a pin, *t*, in the latch which comes into contact with the incline *u*, and this throws the latch *s* outward, unlocking from one of the outer circle of pins and leaving the tool-holder free to turn, when one of the inner circle of pins comes into contact with the swing-piece *r*, said piece being pivoted to enable it to swing to conform to the rotating movement of each inner pin away from the central line of the slide, which contact and the movement of the slide rotates the tool-holder, and in the retreating movement of the slide the pin *t* passes beyond the rear of the incline *u*, and lets the latch, impelled inward by a spring, rest against one of the outer row of pins, till in the continued rotation of the tool-holder, caused by further backward movement of the slide, said pin comes opposite the holding-notch in the latch, which snaps over said pin and locks the tool-holder in place for its advance movement by forward reciprocation of the slide, in which movement the pin *t* passes the incline *u* on the other side, said incline being so arranged as to spring aside under such movement of said pin.

In the tool-holder *q* are taper holes or sockets for reception of tool-shanks, which holes in number and spacing are made to correspond with the intermittent rotations of the tool-holder. There is a stop-pin *v* fixed in the piece *o*, against which the adjustable screws *w* impinge and check the forward movement of the tool-holder. There is provided one of these screws for each tool-socket in the tool-holder, and it will be obvious that each tool can by these means have any desired adjustment as to forward movement independent of the other tools, and in this arrangement of separate stops for each tool acting on one common rotating tool-holder, to admit of different and determined extents of movement, consists another part of my invention.

In the sockets of the tool-holder tools of any desired kind may be secured, and the tool *a* may be secured to a lever-carrier, *c'*, which is pivoted to a face-plate, *b'*, so that as the tool is moved toward its work, it will come to the center of the work which is rotated, and thus insure a cutting action of the tool, which will without breakage of the work entirely and cleanly sever it by cutting. To prevent yield of the work under the action of the cutter *a'*, the shank which holds the face-plate *b* may be made hollow, so as to permit entrance and rotation therein of the partly-formed screws, and to the face plate a back rest, *d*, may be secured so that it can be adjusted against the work and resist the thrust of the cutting-tool, and in this combination consists another part of my invention.

In all screw-cutting machines large quantities of oil or other lubricating fluids are used, and to prevent them from wasting by distribution all over the tail-stock and surface of the bed, and to insure neatness, a groove may be formed all around the top of the carriage *o*, and one all around the top of the bed, in which the oil gathers as it falls off from the work and tools, and is conducted into any suitable receptacle, from which it may be taken to be used again and again.

I claim—

1. In combination with a mechanism for cutting screws from wire, a chuck so arranged that the length of each screw may be adjusted while the machine is in motion.

2. The combination of an adjustable length gage with the means for operating the chuck, substantially as described.

3. Attaching the tool which cuts off the screw to the revolving head, thereby dispensing with the ordinary cross-head.

4. In combination with a rotating tool-carrier, the means for intermittently operating the same, when arranged substantially as described.

5. The arrangement of an adjustable stop with each socket in a rotating tool-holder, so that by the operation of said stops on some fixed part of the tail-stock each tool may be separately and easily adjusted as to its own extent of forward movement.

L. W. LANGDON.

Witnesses:

DAVID E. GRIMES,

CHARLES STRANG.