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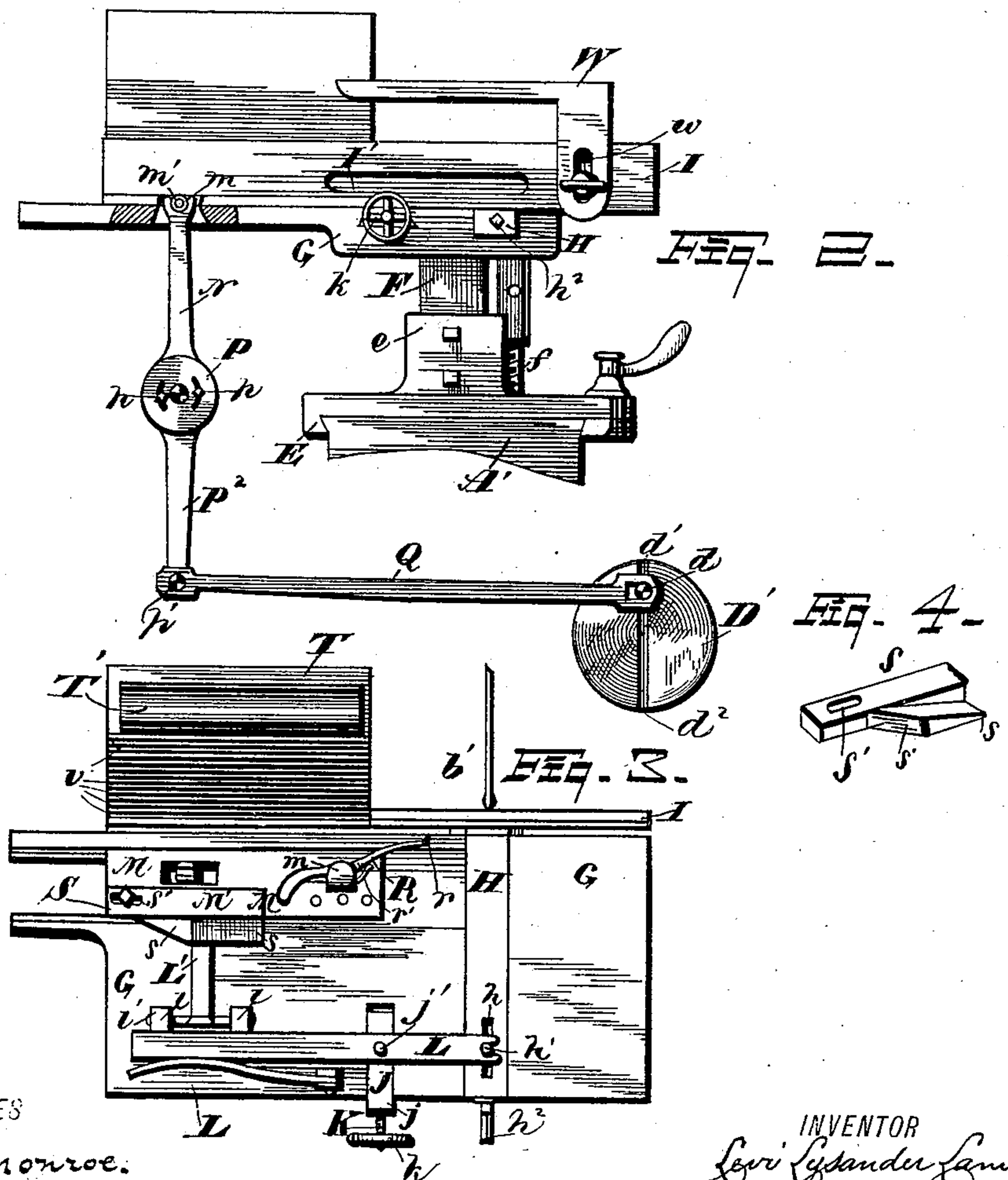
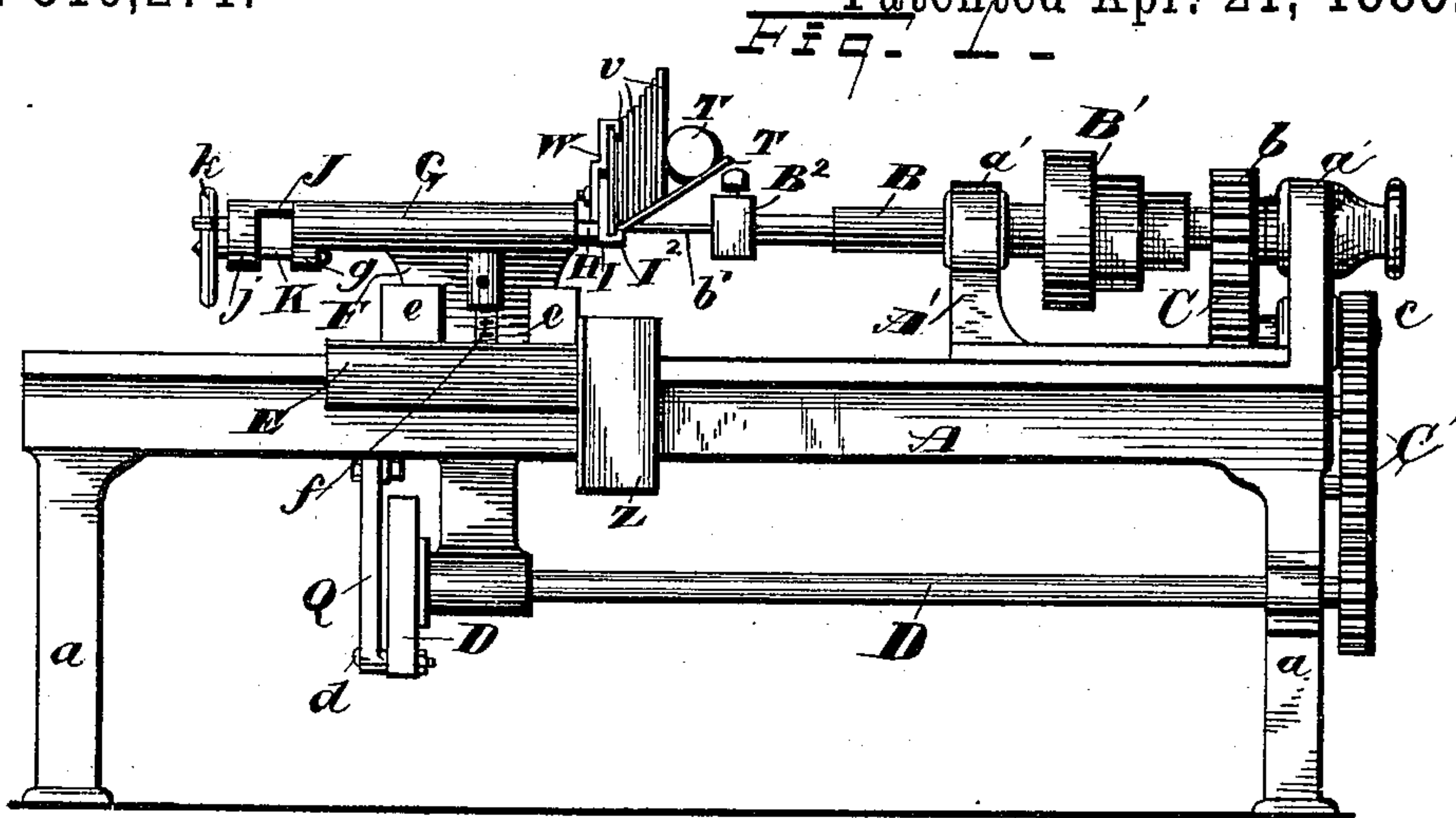
2 Sheets—Sheet 1.

L. L. LAMB.

# COUNTERSINKING MACHINE.

No. 316,271.

Patented Apr. 21, 1885.



WITNESSES

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INVENTOR

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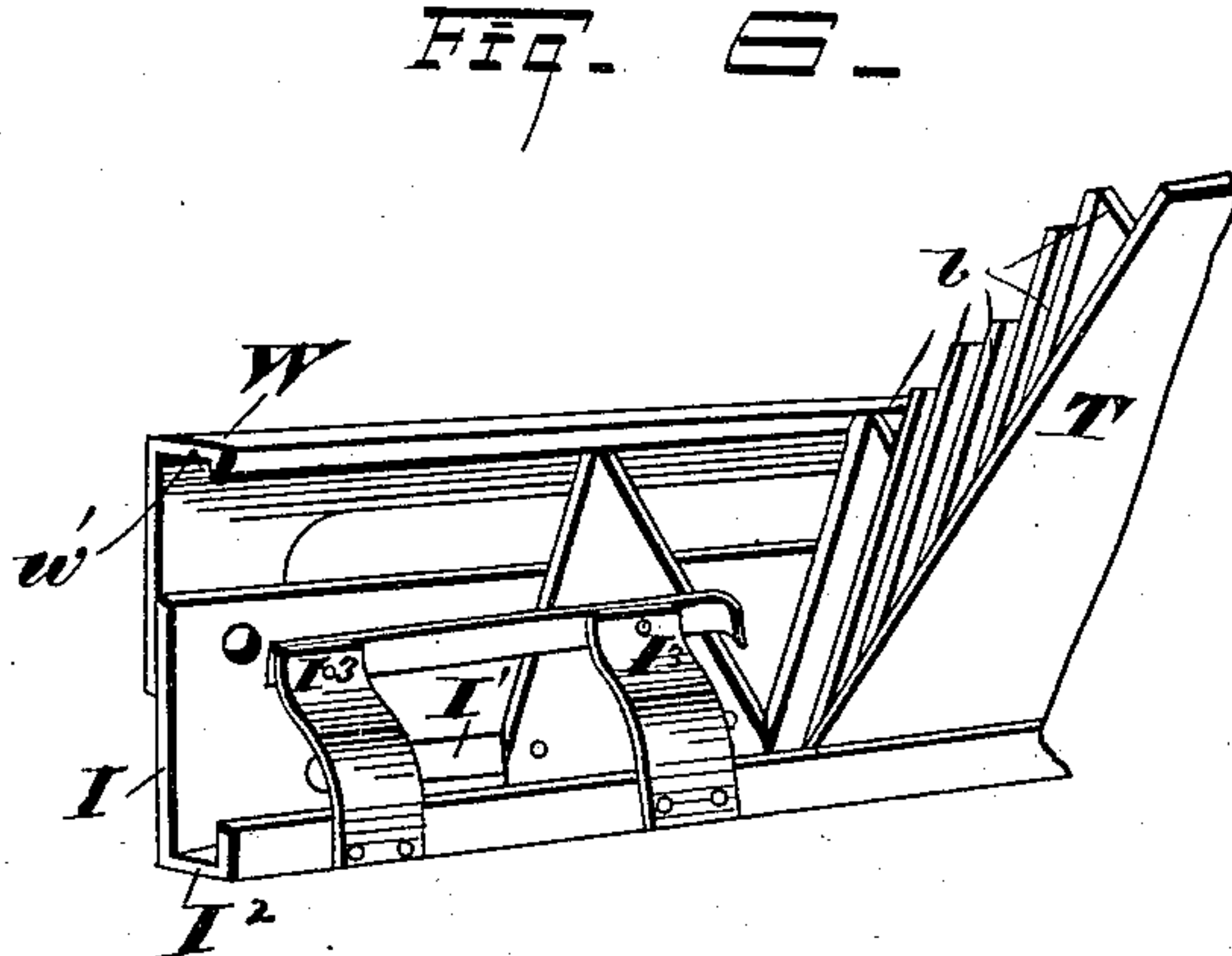
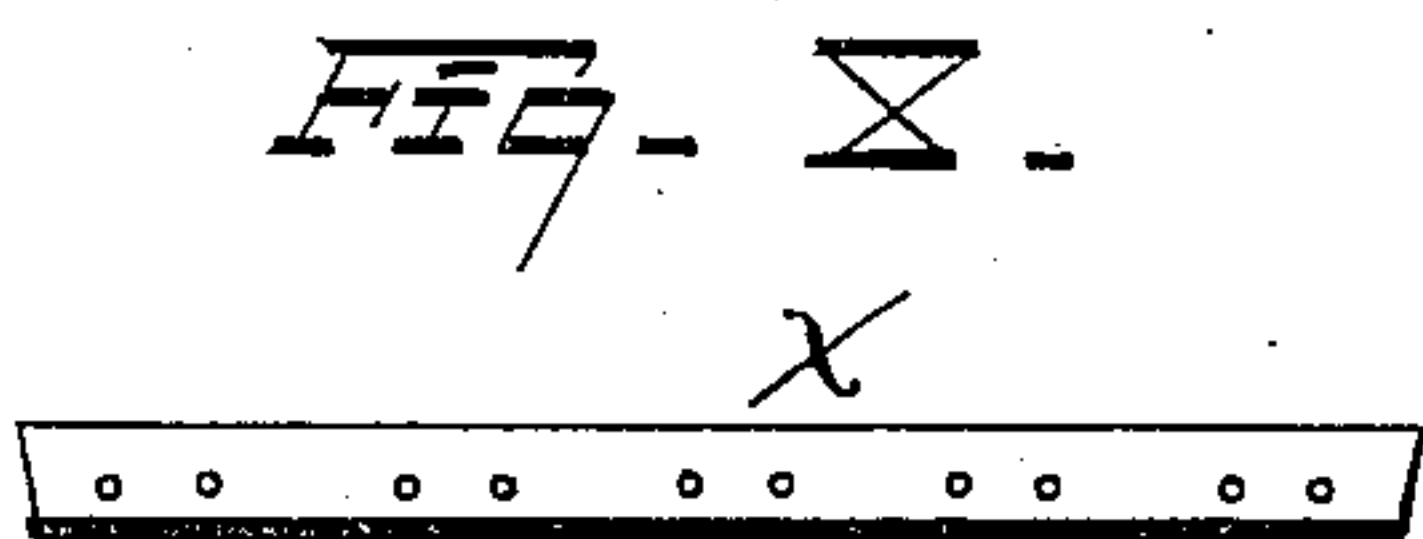
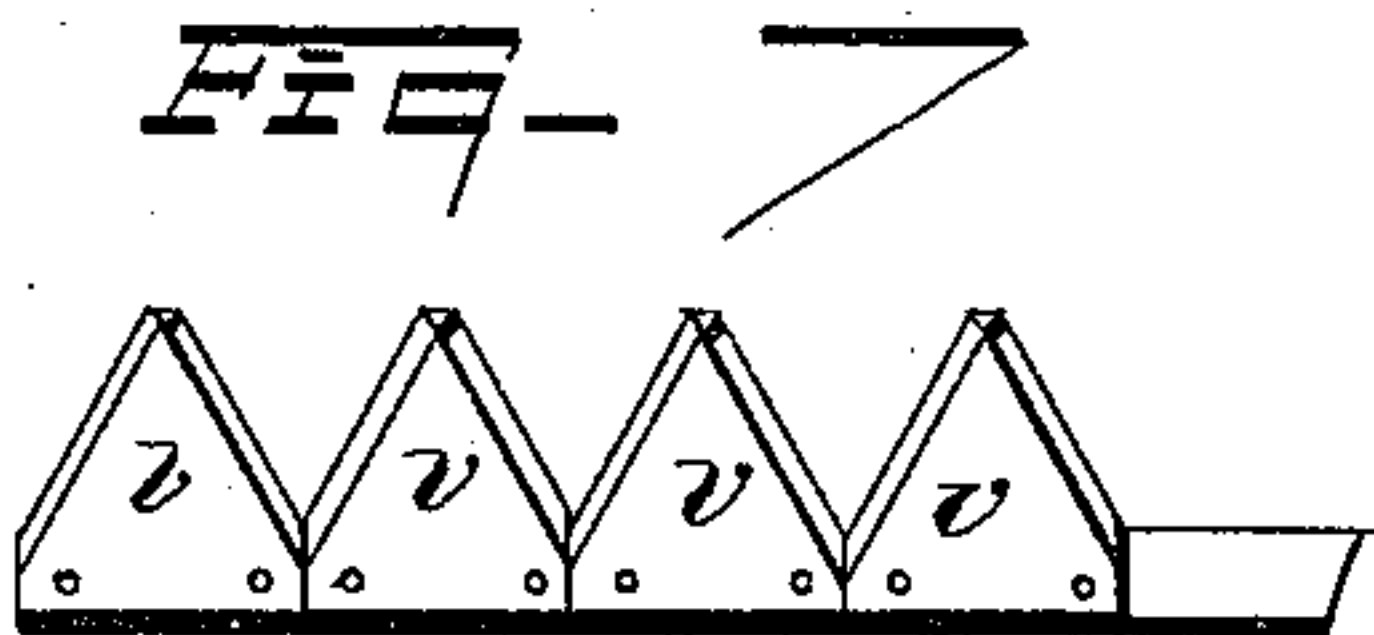
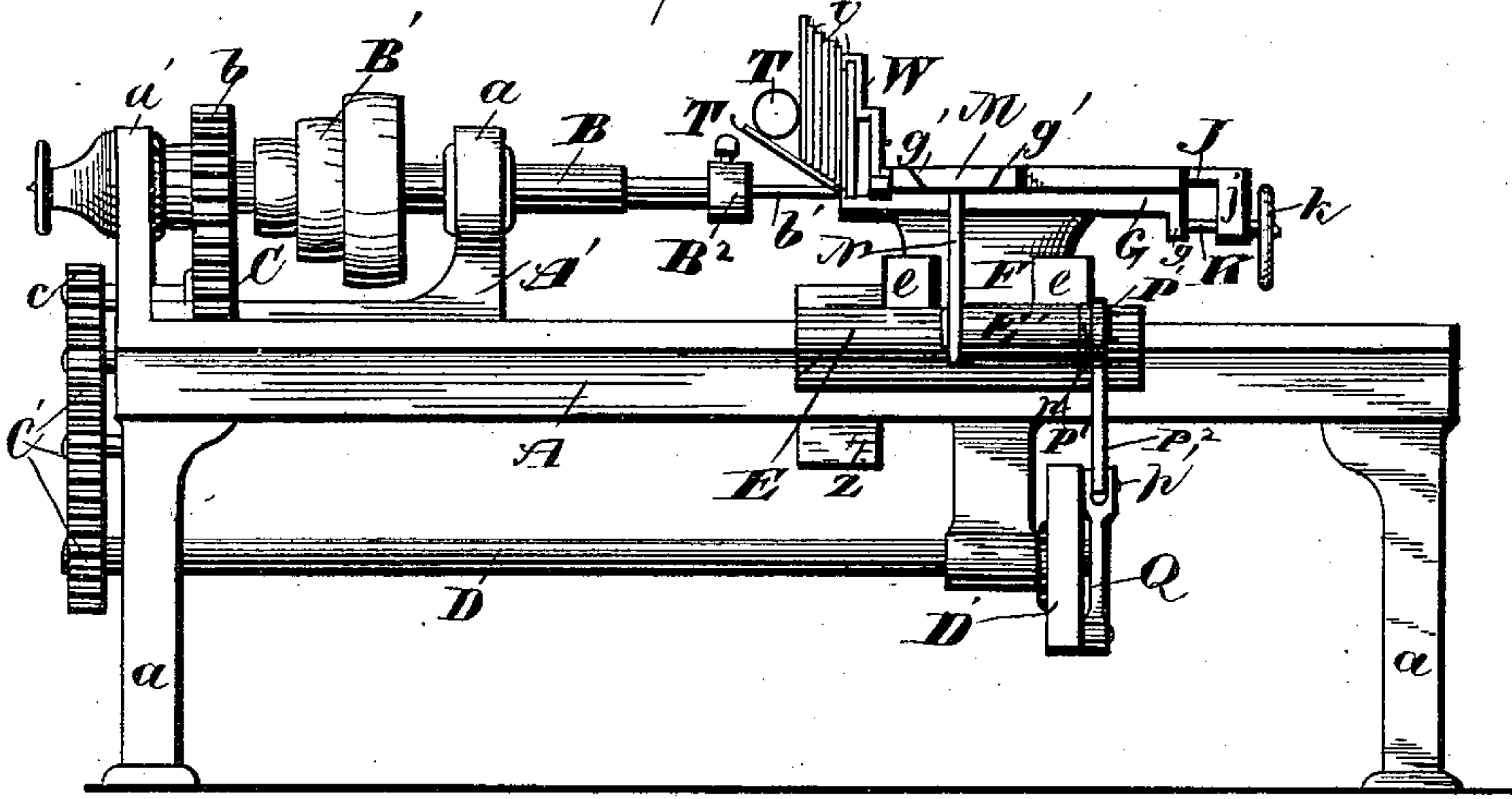
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# UNITED STATES PATENT OFFICE.

LEVI LYSANDER LAMB, OF AKRON, OHIO, ASSIGNOR TO THE WHITMAN & BARNES MANUFACTURING COMPANY, OF SAME PLACE.

## COUNTERSINKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 316,271, dated April 21, 1885.

Application filed September 11, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, LEVI LYSANDER LAMB, of Akron, in the county of Summit and State of Ohio, have invented certain new and useful  
5 Improvements in Countersinking-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the  
10 same.

My invention relates to improvements in countersinking-machines, the object being to provide a machine that will automatically feed the work to the drill or countersink tool  
15 and countersink the holes to an even depth.

With this object in view my invention consists in certain features of construction and in combination of parts, hereinafter described, and pointed out in the claims.

20 This machine is designed more especially for countersinking the holes on the sections and knife and sickle backs for mowers and reapers and similar work. As is well known, the sections are riveted to the back, and the  
25 former are countersunk on the upper side and the latter on the bottom side, and the rivets should fill the countersink, so as to leave smooth surfaces. With ordinary machines that  
30 are operated by hand it is impossible to make the countersinks of uniform size or depth, and consequently the rivet-heads in many cases either do not fill the countersinks or pro-  
35 trude beyond the face of the work, in either case causing imperfections in the work; also, the manual labor necessary in operating these hand-machines greatly increases the initial  
40 cost of the product. I have therefore invented the machine illustrated in the accompanying drawings, in which the work is auto-  
matically fed to and forced against the coun-  
tersink-tool, resulting in the countersinks being made to the required depth and absolutely uniform.

Figure 1 is a rear side view in elevation of  
45 my improved machine. Fig. 2 is an end view in elevation of a portion of the machine. Fig. 3 is a plan view of a portion of the machine including the table and mechanism for feeding the work both endwise and toward the  
50 countersink-tool. Fig. 4 is a view in perspective in detail of the block S. Fig. 5 is a

front side view in elevation of the machine. Fig. 6 is a view in perspective from the rear of the plate I and attachments. Fig. 7 is a plan view of sections arranged side by side in  
55 the position in which they are secured to the knife and sickle backs. Fig. 8 is a plan view of a portion of the knife-back.

A represents the bed or frame of the machine supported on the legs *a*, and provided  
60 with the head-block *A'*, provided with suitable boxes, *a'*, in which is journaled the spindle *B*, that is provided with the cone-wheels *B'* and the gear *b*, the latter engaging the gear *C*, that is mounted on a shaft that passes  
65 through the head-block and has attached the gear *c*, that engages ordinary change-gears, *C'*, by means of which motion is transmitted to the shaft *D*, that is journaled in suitable boxes and located on the rear side of the machine. Of  
70 course other means may be had for transmitting motion to the shaft *D*, but the well-known device of change-gears is preferable. The spindle *B* is provided with any suitable chuck or other device at *B'* for holding the drill or  
75 countersink-tool *b'*.

On top of the part *A* is the frame or saddle *E*, that is provided with two upright ways, *e*, that embrace the slide *F*, to which is attached the table *G*, and a screw, *f*, is provided to ele-  
80 vate the table. The table is provided with a transverse recess, in which operates the sliding block *H*, to the front end of which is attached the plate *I*. In a recess in the block *H* is the small sliding block *h*, that has an up-  
85 wardly-projecting wrist, *h'*. This block *h* is operated by the screw *h'* protruding through the end of the block *H* and provided with a head or squared end adapted to engage a wrench, and by turning the screw the block *h*  
90 may be slid along the block *H*.

The block *J* slides in a recess in the table, and has an overhanging end, *j*, in which is journaled the screw-rod *K*, that is provided  
95 with the hand-wheel *k*, and the screw end of the rod engages the threaded part *g* of the table, and by turning the hand-wheel the block *J* may be moved endwise in either direction. The block *J* is provided with the upwardly-projecting wrist *j'*, on which is ful-  
100 crumed the lever *L*. The one end of this lever is forked and embraces the wrist *h'*, and



the other end has lugs  $l$ , through which passes the pin  $l'$ , to which is attached the arm  $L'$ , for which the lugs and pin form a hinge, so that the free end of the arm may be tilted.

5 The table has a slot longitudinal therewith, and the edges of the table on the sides, at  $g'$ , form ways in which the block  $M$  slides. This block has a vertical opening,  $M'$ , with a pin,  $m$ , secured in the block and extending trans-  
10 versely across the central part of the slot, and has journaled thereon a small roller,  $m'$ , that is embraced by the forked upper end of the arm  $N$ . This arm is rigidly attached to the rock-shaft that is journaled in the box  $E'$ , that  
15 is attached to the part  $E$ . The opposite end of the rock-shaft has rigidly attached the disk  $P'$ . The disk  $P'$  is centered on the rock-shaft, and is secured to the disk  $P$  by bolts that pass through the elongated holes  $p$ , by means of  
20 which the disk  $P$  may be turned a limited distance on the shaft to adjust it in the required relative position to the disk  $P'$ . The disk  $P'$  is integral with the arm  $P^2$ , that at the lower end is connected by the wrist  $p'$  to the con-  
25 necting-rod  $Q$ . The other end of the rod  $Q$  embraces the wrist  $d$ , that is secured to the sliding-block  $d'$ , that is dovetailed in the recess  $d^2$  of the disk  $D'$ , that is mounted on the shaft  $D$ . The block  $d'$  may be slid along the groove  
30  $d^2$  and secured by a set-screw (not shown) in the required position to give the desired length of throw to the crank. As the shaft  $D$  revolves, by means of the said connecting-rod attached as aforesaid, the arms  $P^2$  and  $N$   
35 are oscillated, and the latter, by means of the roller  $m'$  and the pin  $m$ , reciprocates the block  $M$ . After the wrist  $d$  has been adjusted to reciprocate the block  $M$  the required distance, the disks  $P$  and  $P'$  may be adjusted by means  
40 of the holes and slots  $p$  so that the arm  $N$  will incline a trifle toward or from the table, which of course will not change the distance that the block  $M$  is reciprocated, but only change its location, so that it reciprocates far-  
45 ther or not so far rearward in the table, according as the arm  $N$  is moved rearward or forward in the adjustment of the disks  $P$  and  $P'$ .

The block  $M$  has a lug,  $m$ , in which is pivoted the lever  $R$ , that in front is a thumb-  
50 piece, and at the rear has a small pin,  $r$ , inclined rearward and forward, as shown. This pin reaches through the slot  $I'$  of the plate  $I$  and moves the work. The block  $M$  has attached on top the part  $S$ . The part  $S$  has an  
55 elongated hole,  $S'$ , in the shank, through which a bolt passes that secures it to the part  $M$ , and has a laterally-projecting part that overlaps the table, the front face,  $s$ , being vertical, but oblique with the part  $M$ . The projecting part  
60 slopes downward and rearward, forming a wedge or incline terminating at  $s'$ .

The block  $M$ , on its forward stroke, carries the part  $S$  in front of the tongue or lever  $L'$ , and the spring  $L^2$  moves the front end of the  
65 lever  $L'$  to the left hand until the free end of the lever is near the edge of the block  $M$ , by which movement of the lever  $L'$  and by means

of the connections already described the part  $H$  and the attached plate  $I$  are drawn back from the drill or countersink tool  $b'$ . When  
70 the block  $M$  moves rearward, the lever  $L'$  mounts the incline at  $s'$  and slides up over it without moving the lever  $L'$  endwise, and at the extreme end of the rearward throw of the block  $M$  the lever  $L'$  drops down by its grav-  
75 ity in front of the face  $s$ . At the commencement of the forward movement of the block  $M$  the oblique face  $s$  forces the lever  $L'$  to the right hand, causing the parts  $H$  and  $I$  to move toward the drill, and are held in this position  
80 until the point  $s'$  of the wedge is again in front of the lever  $L'$ . In Fig. 3 the relation of parts is shown with the block  $M$  about midway of its forward movement.

The plate  $I$  on the side toward the drill is  
85 provided with the rest  $I^2$ , that supports the work that is pressed gently against the plate  $I$  by the springs  $I^3$ , so that when the work is fed to its proper position opposite of the drill it will not be displaced by the return-stroke  
90 of the feeding device.

If the work consists of knife-backs, a por-  
tion of one of which is shown in Fig. 8, they are placed by hand one at a time on the rest  
95  $I^2$  and back of the spring  $I^3$ .

As the backs are of considerable length,  
benches or some suitable supports should be placed in front and rear of the machine to hold the ends level with the rest  $I^2$ .

The pin  $r$  on its movement rearward will  
100 engage one of the holes in the knife-backs and mount it rearward, and the relation of parts is such that the pin  $r$  at the end of its rear movement is directly opposite the point  
105 of the drill. A light spring,  $r'$ , holds the end of the lever  $R$ , that has the point  $r$ , toward the work, and when the block  $M$  moves forward this end of the lever  $R$  is snubbed back.

It will be seen in Figs. 7 and 8 that the  
110 holes in the backs or along two or more of the sections arranged side by side are of unequal distances apart, and the block  $M$  moves far enough to draw the point  $r$  from one hole to another across the wider spaces, and when  
115 the narrow spaces are encountered the point  $r$  is drawn past the hole and enters it on the return-stroke, so that in either case the hole that the point  $r$  engages is left directly op-  
120 posite the point of the drill. While the point  $r$  is traveling forward in search of another hole, the plate  $I$ , carrying the work, is, by the mechanism already described, being fed for-  
125 ward to the drill and the hole countersunk, and when the block  $M$  is forward, but before it commences the back-stroke, the plate  $I$  and the work, by the action of the spring  $L^2$  on  
130 the lever  $L$ , are instantaneously drawn away from the point of the drill, and this occurs just before the point  $r$  commences to feed the work along the plate  $I$ .

Attached to the forward end of the plate  $I$   
is the inclined plate  $T$ , on which several of the sections  $v$  may be placed, and a loose roll-  
er,  $T'$ , is laid behind them on the plate  $T$ , and



by its gravity forces the sections *v* toward the plate I, and the section next to the plate is in position for the point *r* to engage the rear hole in the section and move it opposite the drill, and the next stroke the point *r* engages the forward hole in the section and moves this section entirely from contact with the other sections that are on the incline T, and the next section takes its place and is forced by the roller T' against the plate I. From time to time the roller T' is removed long enough to place other sections on the incline, but the machine is not necessarily stopped for this purpose.

When the backs are being fed through the machine, the incline T and the roller T' are not used; but the former is not removed, as it is entirely out of the way.

The guide W is attached to the plate I by a thumb-screw that passes through the elongated hole *w*, and is adjusted so that the point of the sections pass through the groove *w'* on the under side of the guide, and the sections by this means are prevented from tilting or becoming misplaced as they are fed along the plate T.

Z is a trough onto which the sections fall when leaving the plate I, and are discharged into any convenient receptacle.

When the machine is at rest, the block *h* is held stationary by the lever L, and by turning the screw *h*<sup>2</sup> the block H and the attached plate I may be moved toward or from the drill to give the required adjustment for the depth of the countersink. The same end is accomplished by turning the hand-wheel *k* and adjusting the fulcrum of the lever L, and this may be done while the machine is running. For instance, when the drill becomes somewhat dull and does not countersink quite deep enough, by moving the fulcrum a trifle toward the work the countersink will be made deeper, and a very nice adjustment may be had by this means.

This machine requires but little attention, and accomplishes the work rapidly and with accuracy.

What I claim is—

1. In a machine for countersinking, a support for the work and suitable mechanism for reciprocating it toward and from the countersink-tool, and a reciprocating feeding device adapted to engage holes in the work, and so arranged that the hole in the work that is engaged by the feeding device will be left opposite the countersink-tool, substantially as set forth.

2. In a countersinking-machine, the combination, with reciprocating mechanism adapted to support and carry the work to and from the countersink-tool, of a reciprocating feeding device provided with a spring-lever and pintle for engaging holes in the work, and so arranged that the pintle will successively engage holes separated by unequal spaces, and will always leave the engaged hole opposite the countersink-tool, substantially as set forth.

3. In a countersinking-machine, the combination, with the part H and the attached plate I, adapted to support the work, and the adjustable wrist *h'*, of the lever L, pivoted on an adjustable fulcrum, and the arm L' and reciprocating part S, substantially as set forth.

4. In a machine for countersinking, the plate I, connected with suitable mechanism for moving the plate toward and from the countersink-tool, and provided with the inclined plate T, in combination with the roller T', substantially as set forth.

5. The plate I, provided with the slot I' and the springs I<sup>3</sup>, of the adjustable part W, substantially as set forth.

6. In a machine for countersinking, the combination of the reciprocating blocks H and M, operating in the same plane, but moving at right angles to each other, and provided with suitable mechanism, preferably as described, by means of which the former is actuated by the latter, and the part H, provided with plate I and attachments for carrying the work to and from the countersink-tool, and the part M, provided with the lever R, and the pintle *r*, for feeding the work along the plate I, substantially as set forth.

7. In a countersinking-machine, the combination, with the lever L and the arm L', hinged to the lever, of the part S, provided with the oblique face *s* and the incline *s'*, substantially as set forth.

8. The combination, with the disk D, having an adjustable wrist, the arm P, and the rod Q, connecting said wrist and arm, of the block M, arm N, for operating the block, a shaft, the arm P<sup>2</sup>, and the disks P and P', connecting the arm P<sup>2</sup> and shaft, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 2d day of September, 1884.

LEVI LYSANDER LAMB.

Witnesses:

ALBERT E. LYNCH,  
CHAS. H. DORER.