(No Model.) 2 Sheets—Sheet 1.

A. RAIS.

DEVICE FOR DRAWING SHELLS AND TUBES.

No. 363,910. Patented May 31, 1887.

Fig. 3.

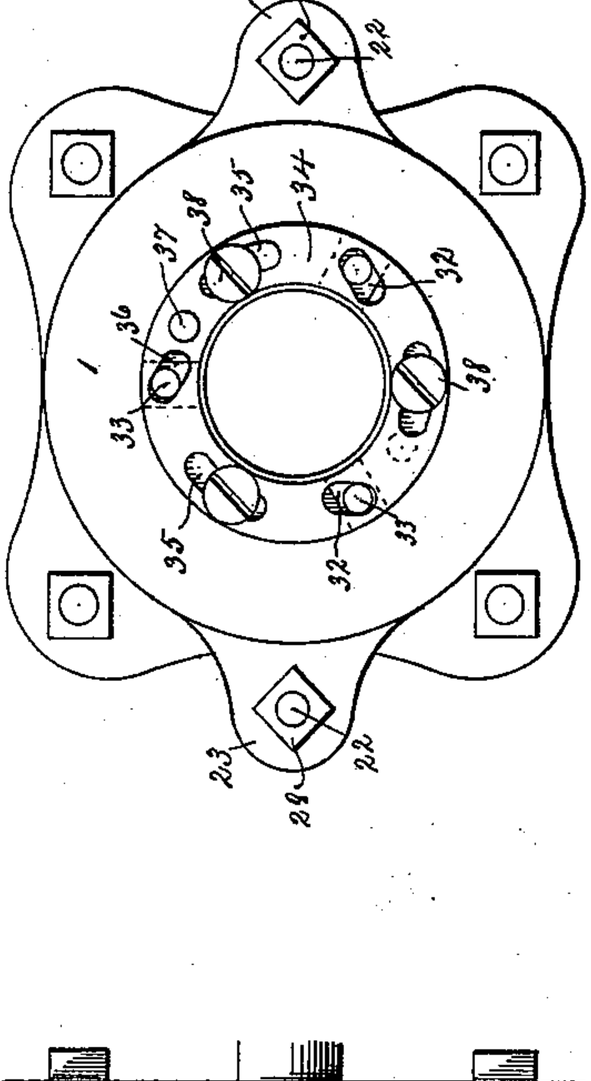


Fig. 4.

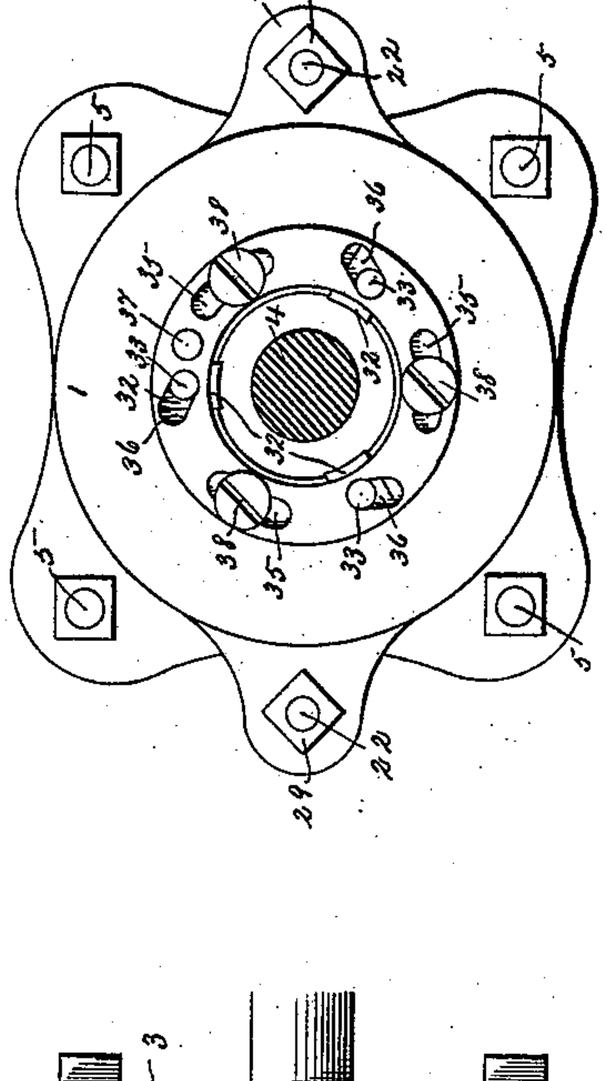


Fig. 1.

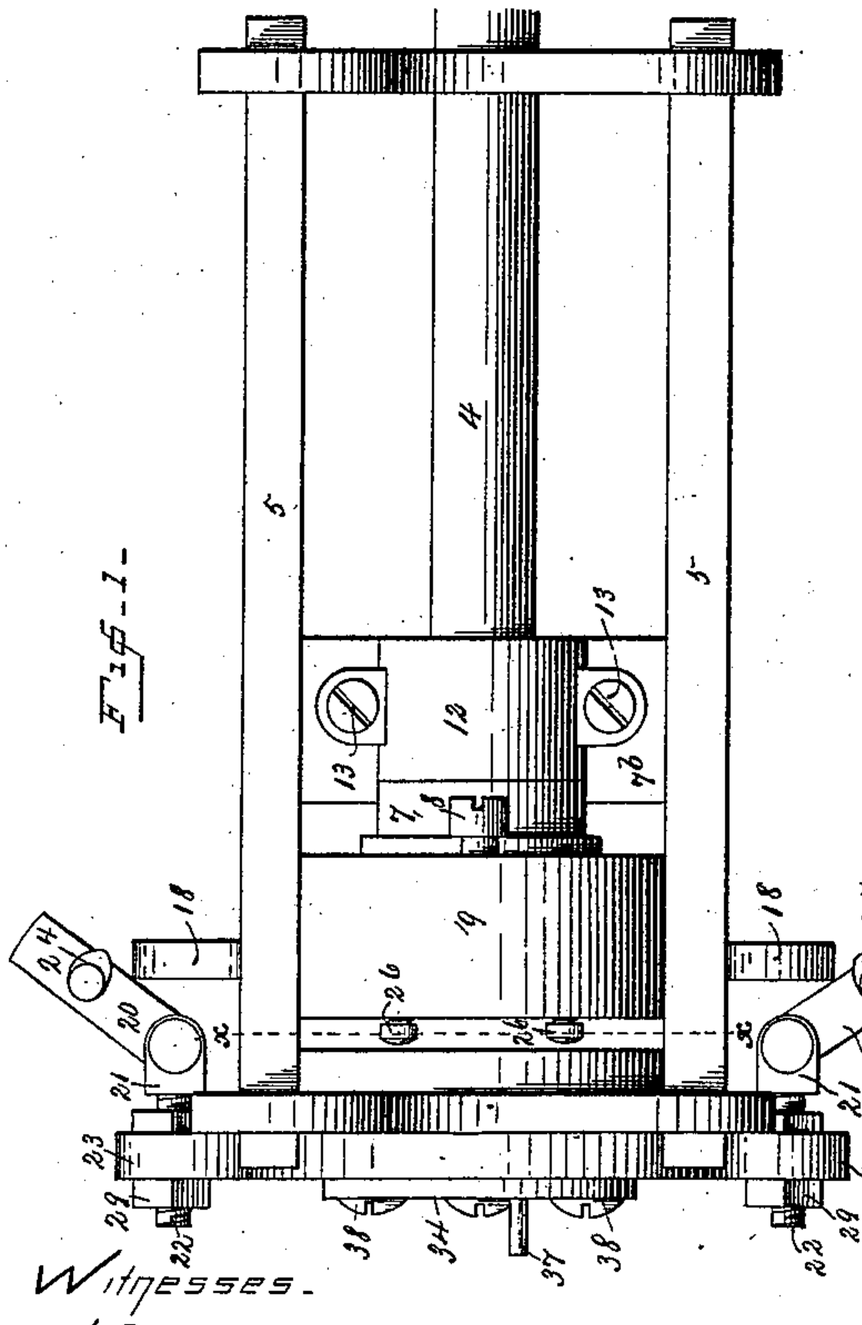
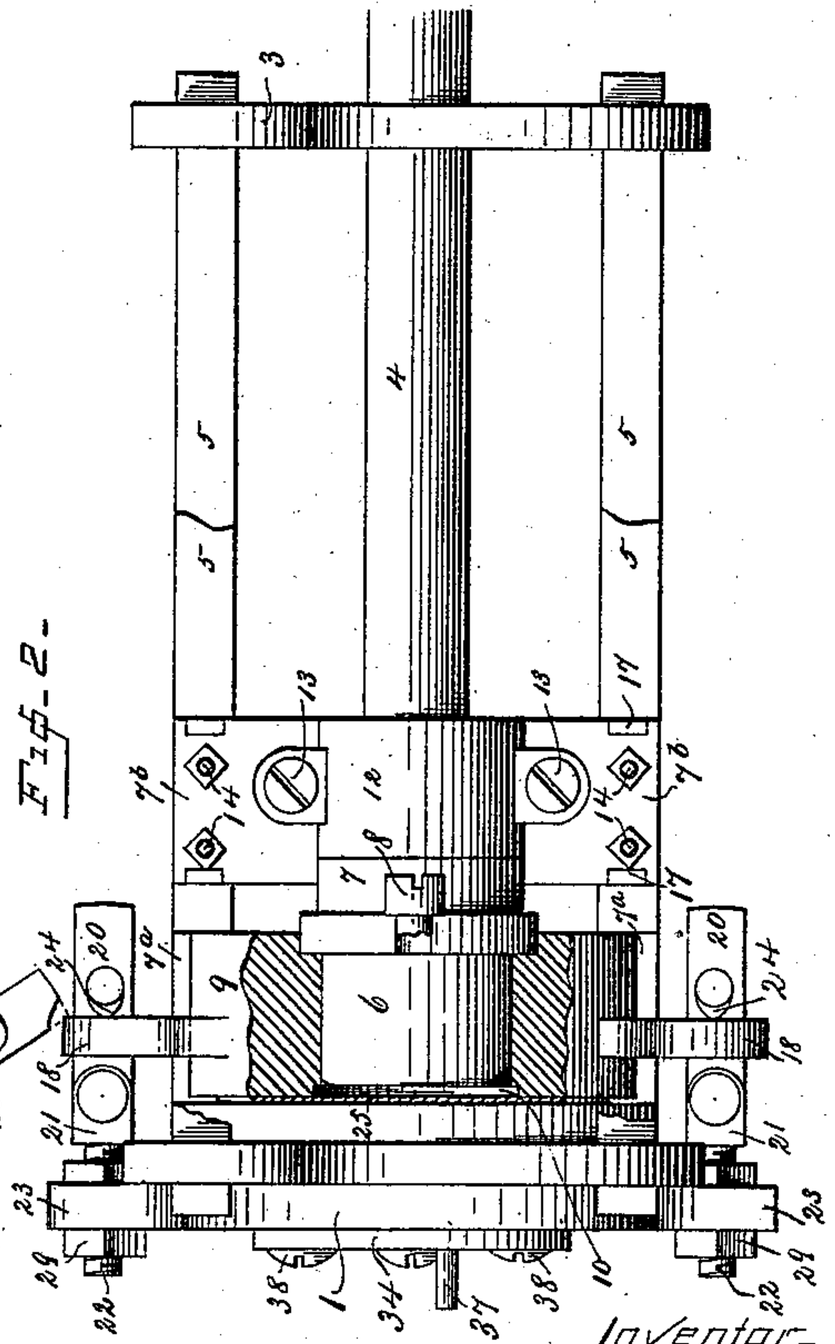


Fig. 2.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

A. RAIS.

DEVICE FOR DRAWING SHELLS AND TUBES.

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Fig. 5.

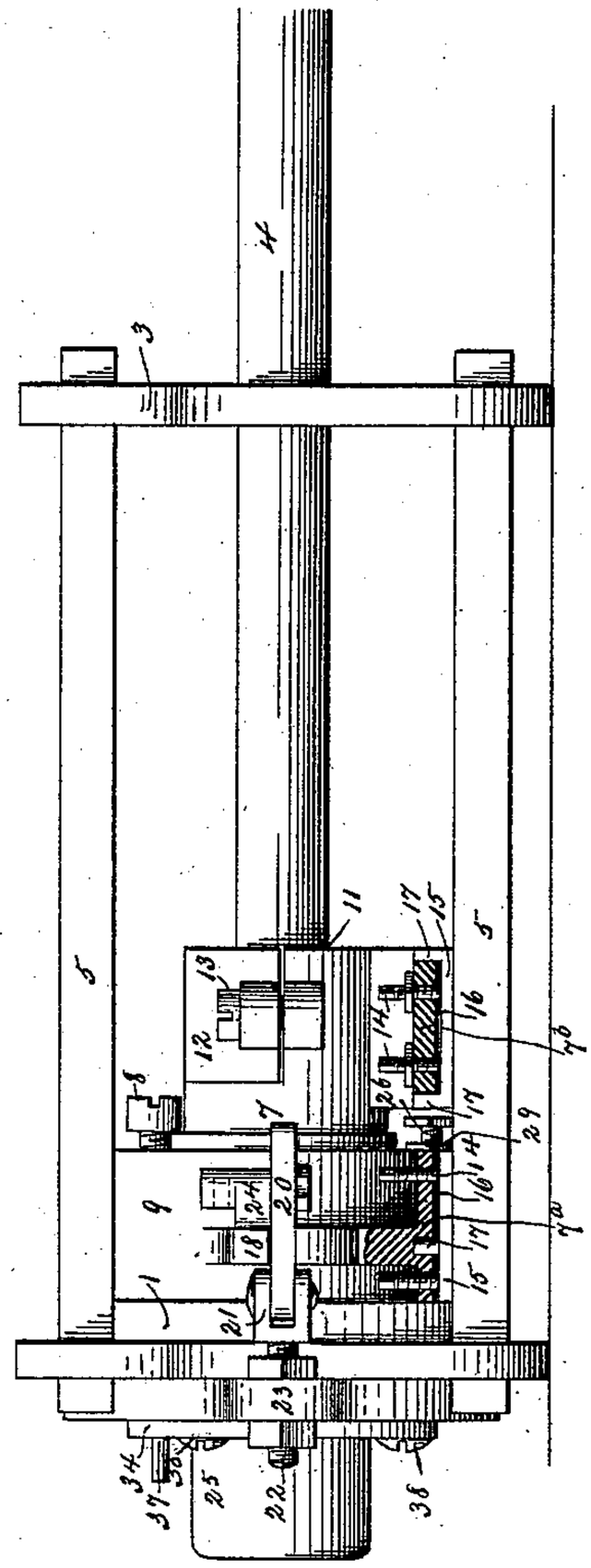


Fig. 6.

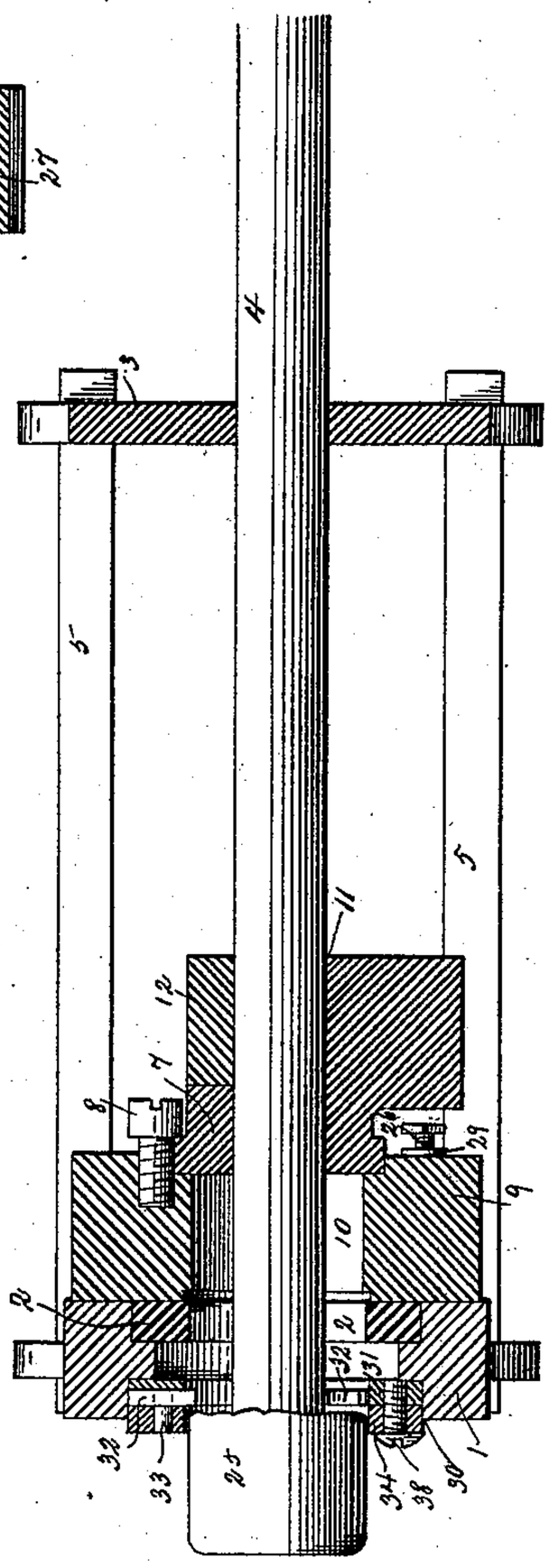


Fig. 7.

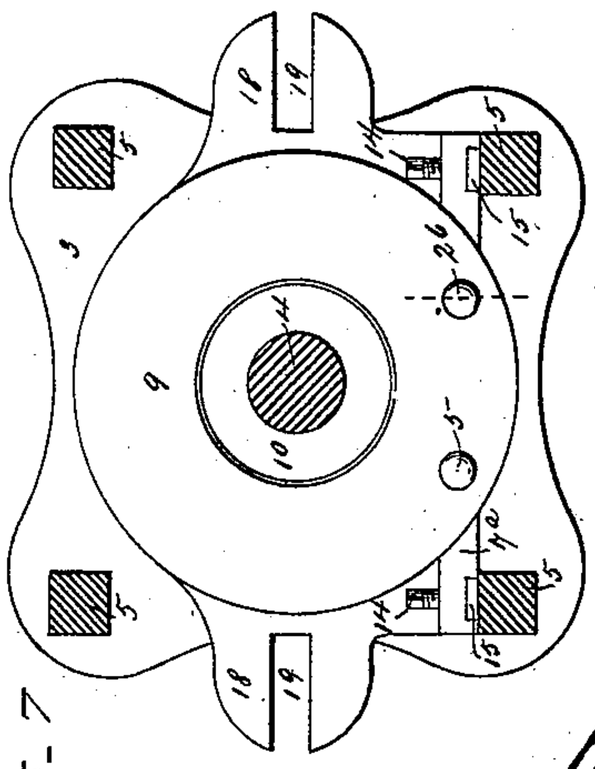
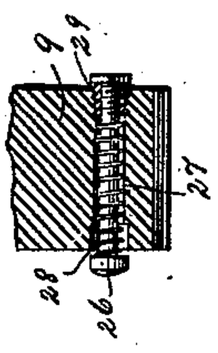


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

ADRIAN RAIS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO RANDOLPH & CLOWES, OF SAME PLACE.

DEVICE FOR DRAWING SHELLS AND TUBES.

SPECIFICATION forming part of Letters Patent No. 363,910, dated May 31, 1887.

Application filed March 28, 1887. Serial No. 232,669. (No model.)

To all whom it may concern:

Be it known that I, ADRIAN RAIS, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Presses for Drawing Seamless Boilers, Tubes, and Shells; 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 appertains to make and use the same.

My invention has for its object to simplify the construction of this class of presses and to greatly improve their mode of operation. With these ends in view, I have devised the improved construction, of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts of the machine.

Figure 1 is a plan view of the press complete, the blank-holder and male die being partly retracted; Fig. 2, a similar view showing the parts in operative position, the upper portion of the blank-holder being removed, showing the male die or mandrel as ready to move forward; Fig. 3, a front end view; Fig. 4, a similar view showing the stripping-dogs thrown into operative position; Fig. 5, a side elevation, partially in section, to show the manner in which the sliding carriage is adjusted; Fig. 6, a vertical longitudinal section; Fig. 7, a cross section on the line *x x* in Fig. 1, looking toward the right; and Fig. 8 is a detail cross-section on the line *y y* in Fig. 7.

1 denotes the die-block, in which the female die 2 is supported; 3, a casting at the opposite end of the machine, through which the plunger 4 passes, and 5 side bars extending longitudinally of the machine, between casting 3 and the die-block.

6 denotes the male die, which is carried at the inner end of the plunger. The plunger may be actuated in any suitable manner, ordinarily, of course, by hydraulic power.

7 denotes a sliding carriage, which is preferably made in two parts, 7^a and 7^b. These parts in use are secured together by a screw, 8.

9 denotes the blank-holder, which is carried by part 7^a of the sliding carriage, and is provided with a central recess, 10, which receives the male die in the retracted position.

11 denotes a bearing for the plunger, which is carried by part 7^b of the sliding carriage. This bearing is provided with a cap, 12, adjusted by screws 13. In use this cap is clamped down upon the plunger with just sufficient pressure to bind the plunger, so that as it moves forward the carriage will be carried with it until the blank-holder is pressed against the blank, when the plunger will continue its forward movement, as will be more fully explained. Both parts of the carriage are made vertically adjustable by means of screws 14, the ends of which bear upon shoes 15, which lie in recesses 16 in the under side of the carriage and rest upon the lower side bars of the frame-work. These shoes are provided with lugs 17, which engage corresponding recesses in the frame-work, to prevent longitudinal displacement. Upon each side of the blank-holder I form a heavy lug, 18, having a recess, 19.

20 represents latches pivoted in ears 21 upon threaded shanks 22, which engage lugs 23 on the die-holder.

24 denotes cams pivoted near the free ends of latches 20.

25 (see Fig. 2) denotes the blank to be operated upon, which is placed between the die block and blank-holder resting upon spring-pins 26, (see Figs. 1, 7, and 8,) which move back into recesses 27 in the die-block against the power of springs 28 when the blank-holder is moved up against the die-block. When the blank-holder is in position against the die-block, latches 20 are swung forward into recesses 19, and cams 24 (see Figs. 2 and 5) are turned as much as may be necessary to clamp the blank firmly in position, a pin-hole (see dotted lines, Fig. 5) being provided in the shank of the cam for convenience in clamping the parts together. The threaded shank which carries the latch is adjustable in lugs 23, and the latches may be locked in the desired position by tightening check-nuts 29 on opposite sides of the lugs. At the forward end of the machine I have provided a stripping device for the drawn blanks. This device is let into a recess, 30, in the front of the die-block, and

consists of an inner ring, 31, having radial recesses across its face for sliding dogs 32, which are provided on their outer sides with pins 33 and an outer ring, 34, having curved slots 35, diagonal slots 36, and an operating pin or handle, 37. In use pins 33 on the dogs engage diagonal slots 36 in the outer ring, and screws 38 pass through the curved slots in the outer ring and engage the inner ring to hold the parts in operative position.

The operation of the entire machine is as follows: Cap 12 upon part 7^b of the carriage is clamped down upon the plunger with sufficient pressure so that as the plunger moves forward it will carry the carriage with it, the male die having, of course, been previously drawn back into the recess in the blank-holder, as indicated in Fig. 2. When the parts are moved forward to about the position indicated in Fig. 1, the blank is inserted between the die-block and blank-holder, resting upon pins 26. When the parts have moved to the position indicated in Fig. 2, the latches are swung forward into recesses 19, and locked there by cams 24, the forward movement of the plunger continues, and the drawing of the blank is effected in the usual manner between the male and female dies. When the plunger has moved forward to the position shown in Figs. 5 and 6—that is, when the operation of the drawing of the blank has been completed—dogs 32 are thrown inward by a backward movement of ring 34, as indicated in Figs. 3, 4, and 6. The backward movement of the plunger then takes place and the drawn blank is stripped from the male die. As soon as the drawn blank is removed from the die, dogs 32 are thrown out of operative position by the forward movement of ring 34, as indicated in Fig. 3. The backward movement of the plunger continues until it is drawn back into recess 10 in the blank-holder. Cams 24 are then turned and latches 20 are swung out of engagement with recesses 19, as indicated in Fig. 1. The parts are then ready for the insertion of a new blank and a repetition of the operation just described.

It will of course be understood that the details of construction of this machine may be varied to an almost unlimited extent without departing from the principle of my invention.

I claim—

1. In a press for drawing seamless tubes and shells, the combination, with the male and female dies and a die-block for the latter, of a sliding blank-holder and swinging latches, whereby the blank-holder and die-block are locked together.

2. The die-block having adjustable swinging latches secured thereto and cams 24 on said latches, in combination with a sliding blank-holder having lugs with recesses 19, which receive latches 20, and are engaged by cams 24, whereby the blank-holder and guide-block are locked together in use.

3. The die-block having adjustable latches carrying locking-cams, in combination with a blank-holder having lugs with recesses, which are engaged by said latches and cams, and spring-pins 26, upon which the blank rests when placed in the machine.

4. The die-block and the sliding carriage, in combination with a blank-holder upon said carriage, having a central recess to receive the male die, a plunger by which said die is carried, and a cap adapted to engage the plunger, so that the carriage is moved forward thereby.

5. In a press for drawing boiler and similar blanks, the combination, with the side bars and the sliding carriage having recesses 16, of shoes 15, which lie in said recesses and rest upon the side bars, and adjusting-screws 14 in the carriage, which bear upon said shoes to adjust the carriage.

6. The combination, with the plunger and the male die carried thereby, of a blank-holder having a central recess to receive the die, a bearing for the plunger having an adjustable cap, and an adjustable sliding carriage for said blank-holder and bearing.

7. The combination, with the plunger, side bars, and casting 3, of a sliding carriage consisting of parts 7^a and 7^b, the blank-holder having spring-pins to support the blank carried by one of said parts, and a bearing for the plunger carried by the other parts, said parts being connected together in use.

8. The plunger, the male die carried thereby, and the side bars, in combination with the sliding carriage having recesses 16, and a blank-holder having a central recess to receive the die, and a bearing for the plunger upon said carriage, and shoes 15, lying in said recesses and resting on the side bars, screws bearing on said shoes to raise and lower the carriage, and lugs 17, whereby the shoes are held in place.

9. In a machine for drawing boiler and similar blanks, the combination, with the dies and die-holder, of dogs 32, having pins engaging diagonal slots in a ring, 34, whereby said dogs may be thrown inward to strip the blank from the male die when it is retracted.

10. The combination, with the dies, plunger, and holder for the female die, of a ring, 31, having radial recesses, sliding dogs with pins in said recesses, ring 34, having diagonal slots 36, engaged by said pins, curved slots 35, and screws passing through said slots and engaging ring 31, whereby the parts are held in position and the dogs are thrown in or out by oscillation of ring 34, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ADRIAN RAIS.

Witnesses:
WM. E. FULTON,
J. M. GALLOND.