W. KLOCKE.

TOGGLE PRESS.

APPLICATION FILED MAY 15, 1920.

1,433,626.

Patented Oct. 31, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

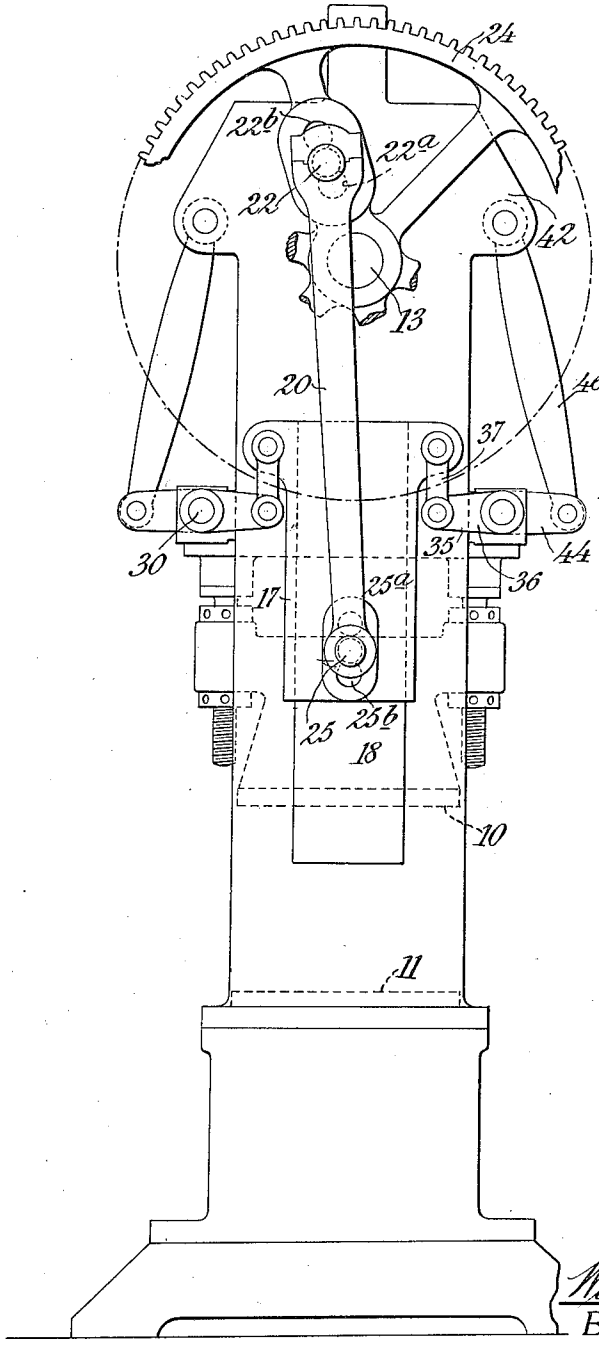
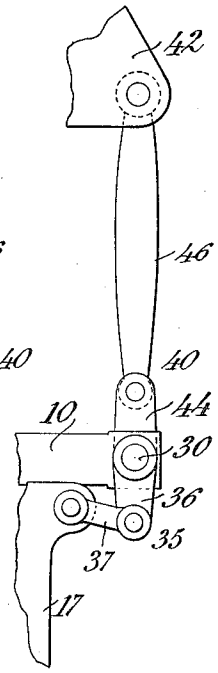


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 2.

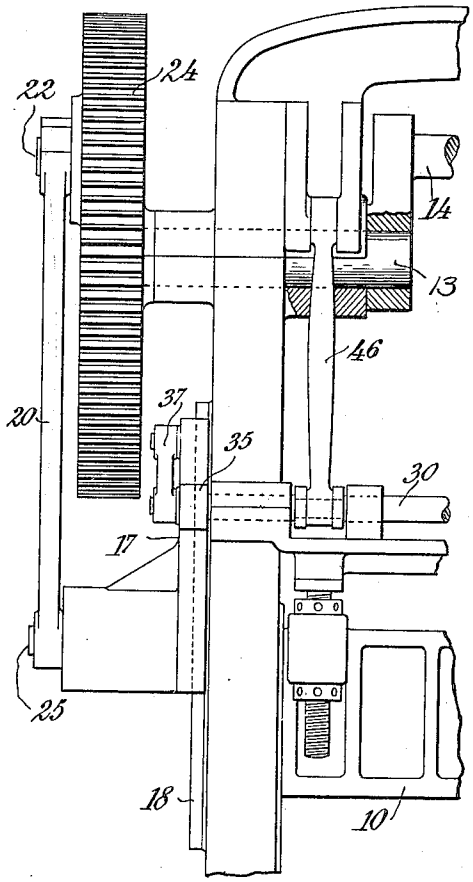


Fig. 4.

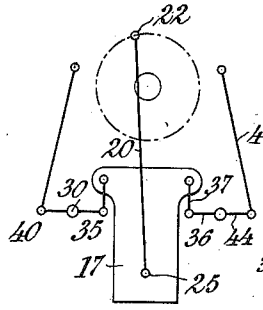


Fig. 5

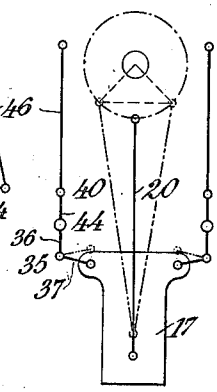


Fig. 6.

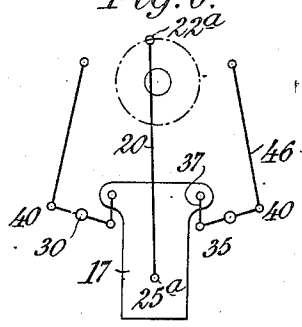


Fig. 7.

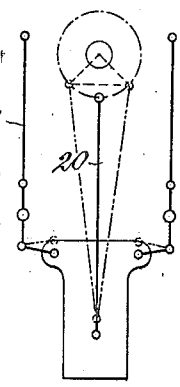


Fig. 8.

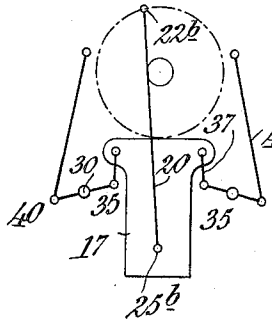
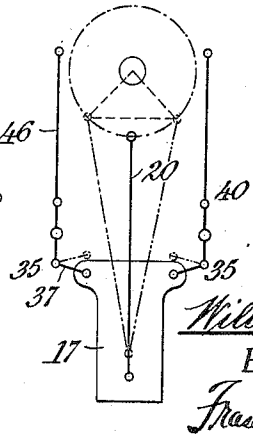


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM KLOCKE, OF WOODHAVEN, NEW YORK, ASSIGNOR TO E. W. BLISS COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF WEST VIRGINIA.

TOGGLE PRESS.

Application filed May 15, 1920. Serial No. 381,776.

To all whom it may concern:

Be it known that I, WILLIAM KLOCKE, a citizen of the United States of America, residing in Woodhaven, in the borough and county of Queens, city and State of New York, have invented certain new and useful Improvements in Toggle Presses, of which the following is a specification.

This invention relates to presses, and aims to provide improvements therein.

The present invention provides a novel toggle mechanism for actuating the slide which carries the blank holder or die.

The invention further provides a slide actuating mechanism which admits of the press being readily altered or adjusted to provide for changing the length of stroke of the said slide which carries the blank holder or die, and which admits of presses having different lengths of stroke of the blank-holder, being built of parts which are the same, or standard, for the several presses, or with a minimum of different parts.

The invention further provides novel combinations and sub-combinations hereinafter set forth.

An embodiment of the invention is illustrated in the accompanying drawings. In said drawings,—

Figure 1 is an end view of a press embodying the invention;

Fig. 2 is a side view of the press showing Fig. 1;

Fig. 3 is a detailed view showing the position of certain parts shown in Fig. 1 in the opposite extreme position of the blank holder or die carrying slide;

Figs. 4 and 5 are diagrammatic views of the parts shown in Figs. 1, 2 and 3 inclusive in the extreme positions of the blank holder or die carrying slide;

Figs. 6 and 7 are views similar to 4 and 5 showing the parts connected to a crank having a throw, which is less than that of the crank in Figs. 4 and 5.

Figs. 8 and 9 are views similar to Figs. 4 and 5 and showing parts actuated by a crank having a greater throw than the crank shown in Figs. 4 and 5.

Referring to said drawings, numeral 10 designates a reciprocatory slide adapted to carry a die or blank holder; numeral 11 designates the bed of the press adapted to carry the supplementary part to the part which the slide 10 carries, as for example, a die, where the slide 10 carries the blank holder. The punch (which is not shown) may work either through the bed or slide. In the present embodiment there is shown a crank shaft 13, the crank 14 of which is adapted to be connected with the punch. The punch in the present embodiment would therefore work through the slide.

The blank holder or die carrying slide 10 has thereon a rocking part such as a rock-shaft or the equivalent, 30. A toggle 40 connects the blank holder or die carrying slide 10 with a fixed part of the frame, as for example, brackets 42. The toggle 40 comprises an arm 44 on the rock shaft 30, and a link 46 connecting the arm 44 with the bracket 42. Means are provided for lifting and rocking the said rock-shaft 30, whereby to bend the toggle 40 and cause the slide 10 to reciprocate or move to and from the blank-holding position of the parts, and these means are preferably such as to cause the slide 10 to dwell in its blank-holding position. These means conveniently comprise a second toggle 35, comprising an arm 36 on the rock-shaft 30, and a link 37 connected to a reciprocatory actuating part, which actuating part is conveniently an actuating slide 17 reciprocating parallelly to the line of movement of the slide 10 upon gibs or the like 18 provided upon the side of the press frame. The slide 17 may be moved in a suitable manner, as here shown being conveniently connected by means of a connecting rod or link 20 attached to a crank pin 22 on a driving gear 24 fast upon the crank shaft 13, and a crank pin 25 on the slide 17. The blank holder or die carrying slide 10 is hence suspended by means of toggles 35 and 40 between the bracket 42 or other fixed part of the press frame and the actuating part or slide 17.

The arrangement of the toggles is preferably such that when the blank holder or die-carrying slide is at the limit of its motion toward the bed, i. e., in the blank-holding position, the toggle 40 is extended and the link 37 of the toggle 35 is substantially perpendicular to the line of movement of the actuator slide 17. At and approaching such position of the parts it will be seen (referring particularly to Fig. 5) that the crank 22 is moving through those degrees of its movement in the vicinity of 270°, and that the two links 44 and 46 of the toggle 40 are in

alinement; and that the end of the link 37 (of the toggle 35) which is attached to the slide 17 is moving in an arc substantially parallel to the arm 36. By this arrangement there is provided a considerable dwell of the blank holder or die-carrying slide 10. By the arrangement shown there is obtained a dwell of more than 90° of rotation of the crank 22.

The present invention admits of readily altering or adjusting the length of the stroke of the blank holder or die-carrying slide 10.

Referring to Fig. 1, there are shown two positions of the crank pin 22 other than that occupied by said crank pin 22 in said figure, and designated by the numerals 22^a and 22^b, the position 22^a being closer to the center of the crank shaft 13 than the crank pin 22, and the position 22^b being further from the center of the crank shaft than the crank pin 22. The link 20 also has preferably a plurality of positions of connection to the slide 17, as, for example, the positions 25, 25^a, 25^b.

The positions of the blank holder or die-carrying slide in the extremes of its position to and from the bed 11 are shown diagrammatically in Figs. 4 to 9 inclusive; Figs. 4 and 5 showing the two extreme positions of the parts; Figs. 6 and 7 showing the position of the parts in their two extreme movements with the crank pins 22 and 25 located in the positions 22^a and 25^a, Fig. 1; and Figs. 8 and 9 showing the position of the parts in their extremes of movement with the crank pins 22 and 25 located in position 22^b and 25^b, Fig. 1. It will be perceived that considerable variation of the length of stroke of the slide 10 may be accomplished by a simple change of position of the crank pin 22, and also preferably a corresponding change of position of the crank pin 25, thereby avoiding the necessity of substituting any of the parts of the toggles 35 and 40.

By reason of the fact that the rock shaft, or equivalent part, 30, moves with the blank holder or die-carrying slide 10, there is no objectionable strain upon the bearings when the toggle parts are in such acute positions as shown in Fig. 8, the press working with satisfactory ease in such positions.

The toggles 35 and 40 are preferably duplicated at the front and back of the press, and moreover in some types of presses, especially heavy presses, it is preferable to provide complete actuating mechanisms for the blank holder or die-carrying slide 10 at the two sides of the press. The driving force may be imparted to the press through the gear or gears 24.

The inventive ideas herein set forth may receive other embodiments than those specifically illustrated and described.

What I claim is:

1. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising a rocking part upon said blank-holder slide, a toggle connected at one end to said rocking part, a reciprocatory part, and a connection between said reciprocatory part and said rocking part, said connection raising said slide, turning said rocking part and moving the parts of said toggle into and out of alinement.

2. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising a rocking part upon said blank-holder slide, a toggle connected at one end to said rocking part, a reciprocatory part, and a toggle connection between said reciprocatory part and said rocking part, said connection raising said slide, turning said rocking part, and moving the parts of said toggle into and out of alinement.

3. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising an actuator-slide, means for reciprocating said actuator-slide, a rocking part upon said blank-holder slide, a toggle between said rocking part and said actuator-slide, and a toggle between said rocking part and a part of the press.

4. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising an actuator-slide, means for reciprocating said actuator-slide, a rocking part upon said blank-holder slide, a toggle between said rocking part and said actuator-slide, and a toggle between said rocking part and a part of the press, said actuator-slide moving parallel to said blank-holder slide.

5. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising an actuator-slide, means for reciprocating said actuator-slide, a rocking part upon said blank-holder slide, a toggle between said rocking part and said actuator-slide, and a toggle between said rocking part and a part of the press, said second named toggle being so arranged that it is extended in a line parallel to the direction of reciprocation of said blank-holder slide, and said first named toggle being so arranged that its leg which is connected to the actuator-slide is substantially perpendicular to the line of movement of said actuator-slide in the extended position of said second named toggle.

6. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with

a dwell in its movement, said means comprising a rocking part upon said blank-holder slide, a toggle between said rocking part and a part of the press, a reciprocatory part, and a second toggle connecting said rocking part and said reciprocatory part, so arranged that its legs are substantially at right angles to one another in the extended position of said first named toggle.

7. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising an actuator-slide, a crank and a connection between said actuator-slide and crank, a rocking part upon said blank-holder slide, a toggle between said rocking part and said actuator-slide, and a toggle between said rocking part and a part of the press.

8. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating said slide with a dwell in its movement, said means comprising an actuator-slide, a crank-shaft, a gear on a crank-shaft, a crank upon said gear, and a connection between said actuator-slide and crank, a rocking part upon said blank-holder slide, a toggle between said rocking part and said actuator-slide, and a toggle between said rocking part and a part of the press.

9. A drawing press comprising a reciprocatory blank-holder, or die-carrying slide and means for reciprocating said slide with a dwell in its movement, said means comprising a rocking part upon said blank-holder slide, a toggle between said rocking part and a fixed part of the press, and means for lifting and rocking said rocking part, whereby to reciprocate said slide.

10. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating the same, said means comprising a reciprocatory part, and serial connections between said reciprocatory part and a fixed part of the press, said connections being connected to said blank-holder slide intermediate the connection of said connections to said reciprocatory part and to said fixed part of the press.

11. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating the same, said means comprising a reciprocatory part, and serial connections between said reciprocatory part and a fixed part of the press, said connections comprising a rocking part on said slide and a toggle between said slide and said reciprocatory part.

12. A drawing press comprising a reciprocatory blank-holder or die-carrying slide, and means for reciprocating the same, said means comprising a reciprocatory part, and serial connections between said reciprocatory part and a fixed part of the press, said connections comprising a rocking part on said slide, a toggle connecting said rocking part and said fixed part of the press, and means between said reciprocatory part and rocking part for rocking the latter.

13. A drawing press comprising a side frame, a reciprocatory blank-holder or die-carrying slide, and means for reciprocating the same, said means comprising an actuating slide alongside said side frame, a rocking part on said blank-holder slide, and a direct connection between said rocking part and said actuating slide.

14. A drawing press comprising a side frame, a reciprocatory blank-holder or die-carrying slide, and means for reciprocating the same, said means comprising a rotary shaft having a wheel thereon on the outside of said side frame, an actuating slide alongside said side frame, a connection between said rotary shaft outside of said wheel, and said actuating slide, a rocking part on said blank-holder slide, and a direct connection between said actuating slide and said rocking part.

In witness whereof, I have hereunto signed my name.

WILLIAM KLOCKE.