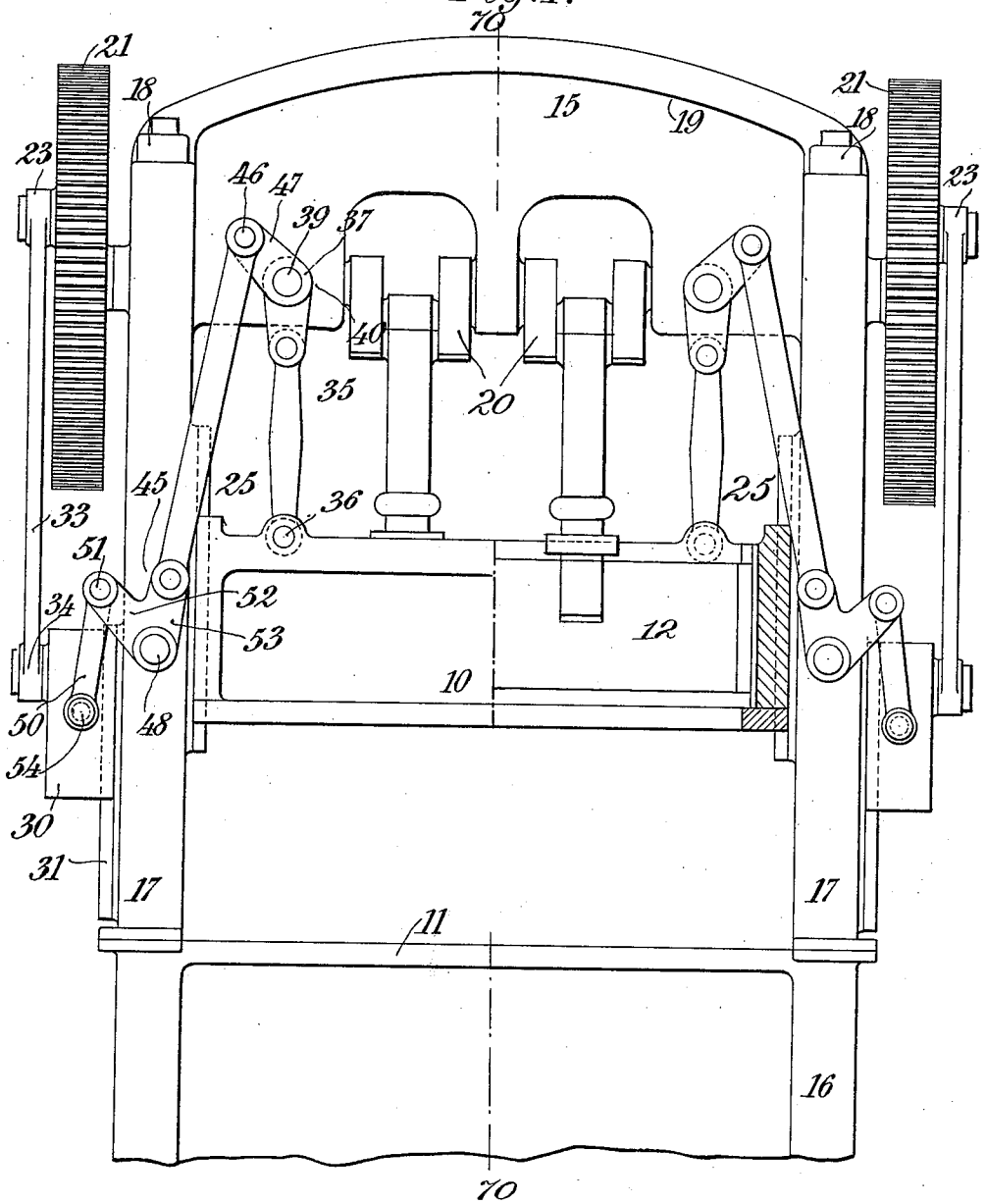
June 12, 1923. 1,458,709

W. KLOCKE

PRESS

Filed Nov. 30, 1920 2 Sheets-Sheet 1

Fig. 1.



Inventor
William Klocke,
By his Attorneys
Fraser Turk Myers

June 12, 1923.

1,458,709

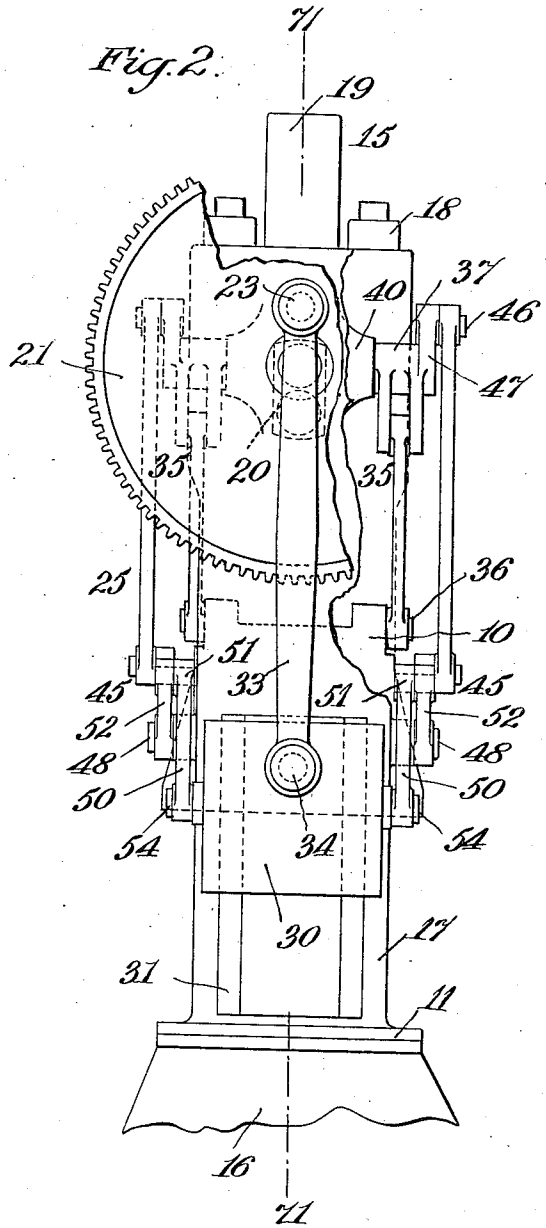
W. KLOCKE

PRESS

Filed Nov. 30, 1920

2 Sheets-Sheet 2

Fig. 2.



Inventor
William Klocke,
By his Attorneys
Fraser Turk & Myers

Patented June 12, 1923. 1,458,709

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.

PRESS.

Application filed November 30, 1920. Serial No. 427,419.

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 Presses, of which the following is a specification.

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

The present invention provides a press having a simple, strong, efficient driving mechanism, comprising toggles for a blank holder or die-carrying slide.

The invention further provides a press having a plurality of driving connections for the blank holder or die-carrying slide, comprising rocking parts arranged on axes parallel with the side frames of the press, usually in the direction of the shortest dimension of the press.

The invention further provides a driving connection or connections for a blank holder or die-carrying slide, wherein the driving force is derived from a crank or other eccentric part turning around an axis at right angles to rocking parts comprising parts of the toggle connections, without involving the use of universal joints, the joints in the connections having simple turning movements around single axes, as, for example, around shafts or pivot pins.

The invention further provides a mechanism, having the characteristics above referred to, wherein the strains imparted by the blank holder or die-carrying slide actuating connections are transmitted to the frame in a direction to be resisted by the ordinary tensile members or reinforcing parts of the press frame. Strains crosswise of the frames are avoided, and the strains of the slide operating mechanism are in the direction of the height of the press, this being in the same direction as the strains arising from the action of the blank holder and punch upon the work.

The invention further provides a novel combination, and sub-combinations of parts of a press hereinafter more fully set forth.

An embodiment of the invention is illustrated in the accompanying drawing, wherein—

Figure 1 is a view, in front elevation, of a press embodying the invention;

Figure 2 is a view, in side elevation, and partly in section, of the construction shown in Figure 1.

Referring to said drawings, numeral 10 designates a blank holder or die-carrying slide, 11 the bed of the press, adapted to support either a die or blank holder complementary to the part carried by the said slide 10, and 12 designates a punch adapted to work either through the bed 11 or slide 10, according to the design of the press, here shown as working through the slide 10.

Numeral 15 designates the frame of the press, which conveniently may comprise the base 16, the side frames or parts 17, reinforced by the tension rods 18 and a yoke or cross-piece 19.

The punch is preferably driven by a crank-shaft 20, running longitudinally of the press, and supported in bearings in the side frames 17. In large presses for heavy duty, the crankshaft 20 preferably extends through the side frames, and has driving parts or gears 21 thereon, at each end, at the outer side of the side frames 17.

The blank holder or die-carrying slide is preferably driven from the same crankshaft 20, which drives the punch 12, and this is conveniently effected through crank pins 23 projecting from the outer sides of the driving parts or gears 21.

The driving connections 25 for the blank holder or die-carrying slide 10 preferably comprise an actuating slide 30, conveniently mounted upon gibs, or the like, 31, upon the outer face of the side frames 17, which actuating slide is conveniently connected to the crank pin 23 on the driving part or gear 21, by means of a link 33 connected at one end to said pin 23, and at its other end to a pin 34 on the slide 30, said pins 23 and 30 being parallel, and providing a simple turning or pivotal movement of the link 33 on the said pins.

The actuating mechanism 25 further comprises a toggle 35, connected to the slide 10, as indicated at 36, and to a rocking part 37, bearing on the frame of the press.

The toggles 35 are preferably duplicated at the front and rear of the press, as indicated in Figure 2, to provide a symmetrical drive, and, when so constructed, the pin 39 is conveniently in the form of a shaft running crosswise of the frame, usually in the direction of the lesser dimension of the press. Conveniently, the rocking part 37

is fixed to the shaft 39, so that the parts 37 and 39 turn together, the yoke 19 being provided with a bearing 40 for the shaft 39.

The toggle 35 is preferably actuated by a second toggle 45, the toggle 45 being connected, by means of a pivotal connection 46, at one end, to a crank arm, or the like, 47, connected to one leg of the toggle 35, either directly, or indirectly through the shaft 39, and the other end of said toggle 45 is conveniently connected to a trunnion or pin 48 on the side frame 17, the trunnion 48 and the toggle 45 being duplicated corresponding to the toggles 35.

The toggle 45 is actuated by the actuating slide 30, being conveniently connected thereto by link 50, which link may be connected, by means of a pivotal connection 51, to a crank arm 52, conveniently formed solidly with one leg 53 of the toggle 45. The link 50 also has a pivotal connection to the slide 30, as indicated at 54.

The axes of the shaft 39 and pivots 46, 48, 51 and 54 are parallel, and, hence, the parts all turn in the same or parallel planes. It will thus be seen that none of the joints of the link 33, or of the toggles 35 and 45 and the link 50 have turning movement in more than one plane, all of the joints having a simple turning movement around one axis, and thereby avoiding the use of universal joints, notwithstanding the arrangement of the axis of the drive shaft 20 at right angles to the axes of the toggles 35 and 45 and the link 50.

Moreover, the arrangement of the parts of the blank holder slide actuating mechanism 25 is such that the strains between the ends of the toggles 35 and 45, and between the ends of the link 33, are in the direction of the tension rods 18 of the press, that is, the strains are in the same direction as the strains between the slide 10 and bed 11.

The blank holder or die-carrying slide mechanism 26 is also preferably duplicated at each side or end of the press, as indicated in Figure 1, that is, the driving connections 25 are preferably symmetrically disposed with relation to the mid-plane 70 of the press, and the mid-plane 71 at right angles to the mid-plane 70.

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

What is claimed is:

1. A press, comprising a frame having a side part, a blank holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said slide and driving part, and connections between said actuating slide and blank holder slide, said connections being pivoted to said actuating slide on axes at right angles to one another, said connections between said actuating slide and blankholder slide comprising a toggle having a bearing at one end on the side frame of the press adjacent said actuating slide and turning around an axis parallel with said side frame.

2. A press, comprising a frame having a side part, a blank holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said slide and driving part, and connections between said actuating slide and blank holder slide, said connections being pivoted to said actuating slide on axes at right angles to one another, said connections between said actuating slide and blankholder slide comprising a toggle having a bearing at one end on the side frame of the press adjacent said actuating slide and turning around an axis parallel with said side frame, and a rocking part having an axis at right angles to said driving part, to which said toggle is also connected.

3. A press, comprising a frame having a side part, a blank holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said slide and driving part, and connections between said actuating slide and blank holder slide, said connections being pivoted to said actuating slide on axes at right angles to one another, said connections between said actuating slide and blank holder slide comprising a toggle having a bearing at one end on the side frame of the press adjacent said actuating slide and turning around an axis parallel with said side frame, and a link connection between said actuating slide and toggle.

4. A press comprising a frame having a side part, a blank holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said slide and driving part, and connections between said actuating slide and blank holder slide, said connections being pivoted to said actuating slide on axes at right angles to one another, said connections between said actuating slide and blank holder slide comprising a toggle having a bearing at one end on the side frame of the press adjacent said actuating slide and turning around an axis parallel with said side frame, and a link connection between said actuating slide and toggle, said toggle having an arm to which said link is connected, said arm and one leg of the toggle constituting a bell-crank.

5. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an

actuating slide, connections between said driving part and actuating slide, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said side frame, adjacent said actuating slide, said connections being pivoted to said actuating slide on axes at right angles to one another.

6. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said driving part and actuating slide, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said side frame, adjacent said actuating slide, a short link connecting said rocking part and actuating slide, said connections being pivoted to said actuating slide on axes at right angles to one another.

7. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a driving part, an actuating slide, connections between said driving part and actuating slide, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said slide frame, adjacent said actuating slide, a toggle, connected at one end to said rocking part, an arm on said rocking part, and a short link connecting said rocking part and actuating slide, said connections being pivoted to said actuating slide on axes at right angles to one another.

8. A press comprising a frame being a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a rotary shaft running through said side frame to the outside thereof, a wheel on the outside part of said shaft, an actuating slide, a connection between said rotary shaft and actuating slide, connected to said actuating slide beyond the periphery of said wheel, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said side frame, adjacent said actuating slide, said connections being pivoted to said actuating slide on axes at right angles to one another.

9. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a rotary shaft running through said side frame to the outside thereof, a wheel on the outside part of said shaft, an actuating slide, a connection between said rotary shaft and actuating slide, connected to said actuating slide beyond the periphery of said wheel, and a connection between said blank-holder slide and actuating slide, said latter connection comprising rocking parts on each side of said side frame, adjacent said actuating slide, and connections between each of said rocking parts and blank-holder slide, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

10. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a rotary shaft running through said side frame to the outside thereof, a wheel on the outside part of said shaft, an actuating slide, a connection between said rotary shaft and actuating slide, connected to said actuating slide beyond the periphery of said wheel, and a connection between said blank-holder slide and actuating slide, said latter connection comprising rocking parts on each side of said side frame, adjacent said actuating slide, short links connecting said rocking parts to said actuating slide, and connections between each of said rocking parts and blank-holder slide, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

11. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a rotary shaft running through said side frame to the outside thereof, a wheel on the outside part of said shaft, an actuating slide, a connection between said rotary shaft and actuating slide, connected to said actuating slide beyond the periphery of said wheel, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said frame, adjacent said actuating slide, a short link connecting said rocking part to said actuating slide, a second rocking part, connections between said second rocking part and blank-holder, and toggles connecting said rocking parts, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

12. A press comprising a frame having a side part, a blank-holder or die-carrying slide, and means for operating the same, said means comprising a rotary shaft running through said side frame to the outside thereof, a wheel on the outside part of said shaft, an actuating slide, a connection between said rotary shaft and actuating slide connected to said actuating slide beyond the periphery of said wheel, and a connection between said blank-holder slide and actuating slide, said latter connection comprising a rocking part on said frame, adjacent said actuating slide, a short link connecting said rocking part to said actuating slide, a second rocking part, toggles between said second

rocking part and blank-holder, and toggles connecting said rocking parts, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

13. A press comprising side frames, a blank-holder or die-carrying slide between said side frames, and means for operating the same, said means comprising a rotary shaft running through said side frames to the outside thereof, a wheel on said shaft, outside of said frames, on each side of the press, an actuating slide on each of said side frames, a connection between said rotary shaft and each of said actuating slides, and connections between said blank-holder slide and each of said actuating slides, said latter connections each comprising a rocking part on a side frame adjacent an actuating slide, the connections to said actuating slides being pivoted thereto on axes at right angles to one another.

14. A press comprising side frames, a blank-holder or die-carrying slide between said side frames, and means for operating the same, said means comprising a rotary shaft running through said side frames to the outside thereof, a wheel on said shaft, outside of said frames, on each side of the press, an actuating slide on each of said side frames, a connection between said rotary shaft and each of said actuating slides, and connections between said blank-holder slide and each of said actuating slides, said latter connections each comprising rocking parts on each side of each side frame, adjacent an actuating slide, and connections between each of said rocking parts and blank-holder slide, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

15. A press comprising side frames, a blank-holder or die-carrying slide between said side frames, and means for operating the same, said means comprising a rotary shaft running through said side frames to the outside thereof, a wheel on said shaft, outside of said frames, on each side of the press, an actuating slide on each of said side frames, a connection between said rotary shaft and each of said actuating slides, and connections between said blank-holder slide and each of said actuating slides, said latter connections each comprising a rocking part on a side frame adjacent an actuating slide, a short link connecting each of said rocking parts to an actuating slide, and connections between said rocking parts and blank-holder slide, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

16. A press comprising side frames, a blank-holder or die-carrying slide between said side frames, and means for operating the same, said means comprising a rotary shaft running through said side frames to the outside thereof, a wheel on said shaft, outside of said frames, on each side of the press, an actuating slide on each of said side frames, a connection between said rotary shaft and each of said actuating slides, and connections between said blank-holder slide and each of said actuating slides, said latter connection comprising a rocking part on each of said side frames, adjacent an actuating slide, a short link connecting each rocking part to an actuating slide, a second rocking part, toggles between said second rocking part and blank-holder, and toggles connecting said rocking parts, said connections which are connected to said actuating slide being pivoted thereto on axes at right angles to one another.

In witness whereof, I have hereunto signed my name.

WILLIAM KLOCKE.