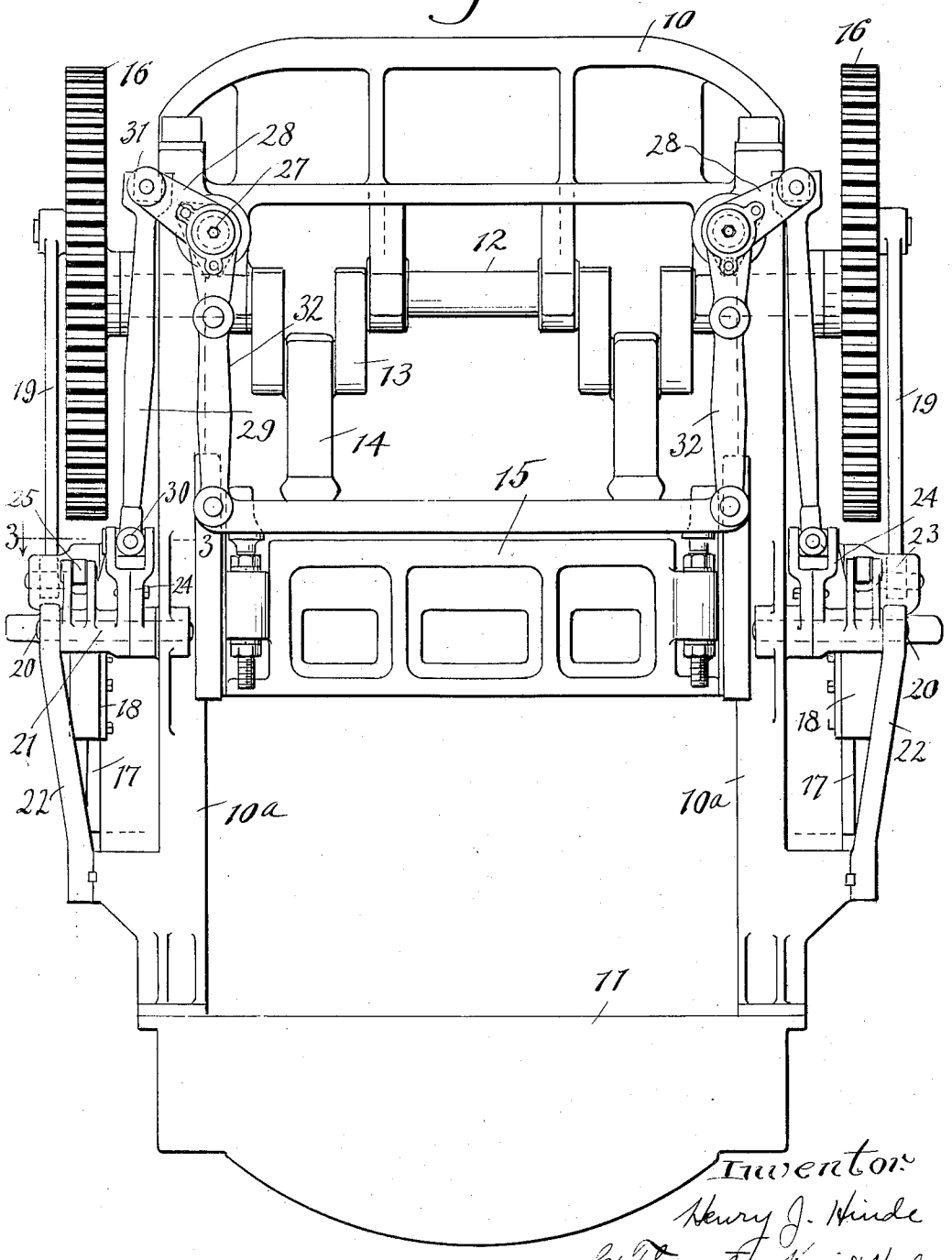
May 26, 1925. 1,539,085

H. J. HINDE

PRESS

Filed April 16, 1920 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

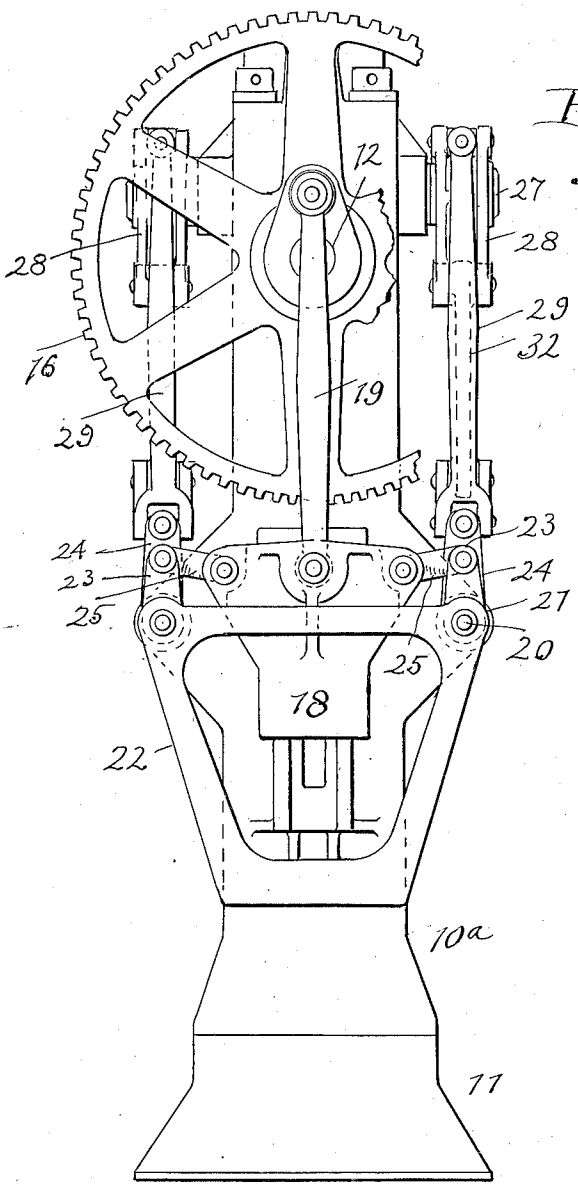
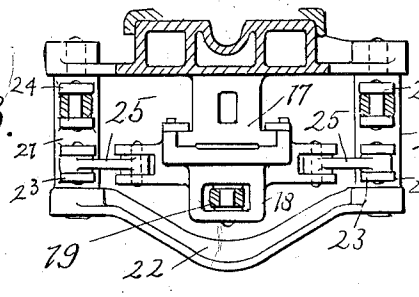


Fig. 3.



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Patented May 26, 1925. 1,539,085

UNITED STATES PATENT OFFICE.

HENRY J. HINDE, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO MACHINE AND TOOL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

PRESS.

Application filed April 16, 1920. Serial No. 374,269.

To all whom it may concern:

Be it known that I, HENRY J. HINDE, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Improvement in Presses, of which the following is a full, clear, and exact description.

This invention relates to an improved metal drawing press of the type having a metal deforming or shaping plunger and a work-holder which holds the work during the shaping operation. The principal object of the invention is to provide mechanism for operating the work-holder which is efficient, and imparts to the work-holder the precise movements desired, but which is simpler in construction than the operating mechanisms heretofore used. Further, the invention aims to provide a work-holder operating mechanism which is actuated from both ends of the plunger operating crank-shaft, and which avoids the use of the commonly employed rock-shafts or equivalent elements which are subjected to twisting or torsional stresses.

The invention may be briefly summarized as consisting in certain novel details of construction, and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheets of drawings, Fig. 1 is a side view of a machine embodying the present invention; Fig. 2 is an end view of the same with a portion of one of the driving gears on the end of the crank-shaft broken away; and Fig. 3 is a transverse sectional view substantially along the line 3—3 of Fig. 1.

Referring now to the drawings, 10 represents the frame of the press, provided at the bottom with a support 11 for the matrix which is not shown. At the top of the press is a crank-shaft or power shaft 12, having cranks 13 which are connected by links or connecting rods 14 to the work deforming or shaping plunger, not shown. The plunger is surrounded and guided by the work-holder 15 which is guided on the sides 10^a of the frame 10, and is actuated by mechanism constituting the subject matter of the present invention.

The crank-shaft 12 is provided at both ends with driving gears 16, which are adapted to be engaged and driven by pinions, not shown, and in turn supported and driven in any suitable manner and from any desired source of power.

For the purpose of actuating the work-holder, guides 17 are provided beneath the gears on the sides 10^a of the frame, and on these guides which are some distance outward from the frame are slides 18 which are moved vertically on the guides beneath the gears by rods 19 which are on the outer sides of, and are actuated by the gears, each rod being connected at an off-center point to one of the gears, and at its lower end pivotally connected to the associated slide.

On each side of the frame and mounted on studs 20 are two rockers 21, symmetrically located with respect to the vertical center plane of the machine, the inner ends of the studs 20 on which these rockers are mounted being supported in bosses on the side members of the frame, while their outer ends are supported in supporting frames or brackets 22, secured to the frame and extending across from one stud to the other, as shown in Figs. 2 and 3. Each of these rockers 21 has two arms 23 and 24, the arm 24 being in this instance somewhat longer than the arm 23, and being located on the inner side of the latter. Each of the slides 18 imparts rocking movement to the rockers 21 located on opposite sides thereof by links 25 which are pivotally connected to the slide and pivotally connected to the ends of the shorter arms 23. In other words, the two rockers at each end of the machine are actuated by mechanism similar to that described and claimed in Lindgren Patent No. 1,268,370, granted to The Toledo Machine & Tool Co., the assignee of the present invention.

However, instead of employing rock-shafts on the front and rear sides of the machine designed to be actuated by the rockers, and in turn to impart movement to the work-holder as in the Lindgren patent above referred to, I mount on studs 27, provided on both sides of the machine, near the top of the sides 10^a of the latter, four bell-cranks 28; that is to say, there are two of these bell-cranks near the top of each side of the machine, all similar in construction and similarly disposed.

These bell-cranks are actuated by the rockers 21 through the medium of rods 29,

which at their lower ends have universal joint connections 30 with the relatively long arms 24 of the rockers, while at their upper ends they have universal joint connections 31 with outwardly extending arms of the bell-cranks 28. The movement of these bell-cranks is imparted to the work-holder through the medium of links or toggle arms 32 which may be connected to the work-holder in any of the customary ways.

The above completes the description of the improved work-holder operating mechanism, which is obviously simple in construction, but as before stated, efficient and satisfactory in construction and operation.

As far as I am aware, I am the first to actuate the work-holder by mechanism operating on the principle, and composed of parts arranged as shown. I do not claim to be the first to employ bell-cranks arranged somewhat similarly to those herein disclosed, as the use of such bell-cranks is shown in the Hinde, Orton & Lindgren Patent No. 1,089,558, granted to The Toledo Machine & Tool Co., which patent discloses a machine of the general type of that herein shown, and while the construction shown in the patent referred to is very efficient, the present mechanism is somewhat simpler, equally as efficient and satisfactory, and requires less head room than the press of the patent.

In other respects the present invention differs from that disclosed in the patent referred to, these including the fact that the bell-cranks are actuated simultaneously from opposite ends of the machine through mechanism deriving its power from the twin driving gears on the crank-shaft. It is distinctly novel with me also to actuate the bell-cranks through the arms of rockers which swing in planes at right angles to the plane of movement of the bell-cranks.

While I have shown only the preferred embodiment of my invention, I do not wish to be confined to the details shown, except to the extent that I am limited by the terms of the appended claims.

Having described my invention, I claim:

1. In a press of the type having a plunger and a work-holder, a crank-shaft supported by the frame for operating the plunger and provided at its ends with twin driving gears, crank or toggle arms for actuating the work-holder and arranged on opposite sides of the frame to swing in planes parallel to the axis of the crank-shaft, means for swinging said arms comprising rods arranged at both ends of the machine, and at their upper ends having movement transmitting connections with said arms, which connections constrain the upper ends of the arms to move vertically, and in and out with reference to the ends of the frame, power transmitting means connecting the lower ends of said rods with both of said driving gears, which connections constrain the lower ends of the rods to move vertically and laterally in planes at right angles to the axis of the crank-shaft.

2. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, individually mounted crank or toggle arms connected to the work-holder and arranged on opposite sides of the frame to swing in planes parallel to the axis of the crank-shaft, means for actuating said arms comprising rods arranged in pairs at both ends of the machine, and each having their upper ends operatively connected to one of said arms and constrained to swing vertically, and in and out with reference to the ends of the frame, means for actuating said rods comprising crank arms connected to the lower ends of said rods and mounted to swing in planes at right angles to the axis of the crank-shaft, and means for swinging the last mentioned arms.

3. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, crank or toggle arms connected to the work-holder and arranged on opposite sides of the frame to swing in planes parallel to the axis of the crank-shaft, means for actuating said arms comprising rods arranged at both ends of the machine, and having their upper ends operatively connected to said arms and constrained to swing vertically, and in and out with reference to the ends of the frame, means for actuating said rods comprising rockers arranged at the ends of the frame with axes arranged parallel to the axis of the crank-shaft and having arms arranged to swing at right angles to the axis of the crank-shaft and connected to the lower ends of said rods.

4. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, crank or toggle arms connected to the work-holder and arranged on opposite sides of the frame to swing in planes parallel to the axis of the crank-shaft, means for actuating said arms comprising rods arranged at both ends of the machine, and having their upper ends operatively connected to said arms and constrained to swing vertically, and in and out with reference to the ends of the frame, means for actuating said rods comprising rockers arranged at the ends of the frame with axes arranged parallel to the axis of the crank-shaft and having arms arranged to swing at right angles to the axis of the crank-shaft and connected to the lower ends of said rods, twin driving gears on the ends of the crank-shaft, and means for transmitting movement from both gears to said rockers.

5. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, crank or toggle arms connected to the work-holder and arranged on opposite sides of the frame to swing in planes parallel to the axis of the crank-shaft, means for actuating said arms comprising rods arranged at both ends of the machine, and having their upper ends operatively connected to said arms and constrained to swing vertically, and in and out with reference to the ends of the frame, means for actuating said rods comprising rockers arranged at the ends of the frame with axes arranged parallel to the axis of the crank-shaft and having arms arranged to swing at right angles to the axis of the crank-shaft and connected to the lower ends of said rods, twin driving gears on the ends of the crank-shaft, and means for transmitting movement from both gears to said rockers, said means comprising slides connected to the gears and connections between the slides and the rockers.

6. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, bell cranks supported on opposite sides of the frame near the top thereof and arranged to swing in planes parallel to the axis of the crank-shaft, said bell cranks having arms connected to the work-holder, and means for actuating the bell cranks comprising a pair of rods arranged at each end of the machine, each individual to one of said bell cranks, the upper end of each rod being operatively connected to one arm of the associated bell crank and constrained to move with a combined vertical movement, and in and out swinging movement with reference to the frame, and a common actuating means connected to the lower ends of each pair of rods to swing them vertically and laterally with reference to the axis of the crank-shaft.

7. In a press of the type having a plunger and a work-holder, a frame, a crank-shaft supported by the frame for operating the plunger, bell cranks supported on opposite sides of the frame near the top thereof and arranged to swing in planes parallel to the axis of the crank-shaft, said bell cranks having arms connected to the work-holder, means for actuating the bell cranks comprising a pair of rods arranged at each end of the machine, each individual to one of said bell cranks, the upper end of each rod being operatively connected to one arm of the associated bell crank and constrained to move with a combined vertical movement, and in and out swinging movement with reference to the frame, and means connected to the lower ends of the four rods to swing them vertically and laterally with reference to the axis of the crank-shaft, said last mentioned means comprising slides adapted to be moved vertically at both ends of the machine, and rockers positioned on opposite sides of each slide, said rockers being connected to the slides and having arms connected to the lower ends of said rods and arranged to swing in planes at right angles to the axis of the crank-shaft.

In testimony whereof, I hereunto affix my signature.

HENRY J. HINDE.