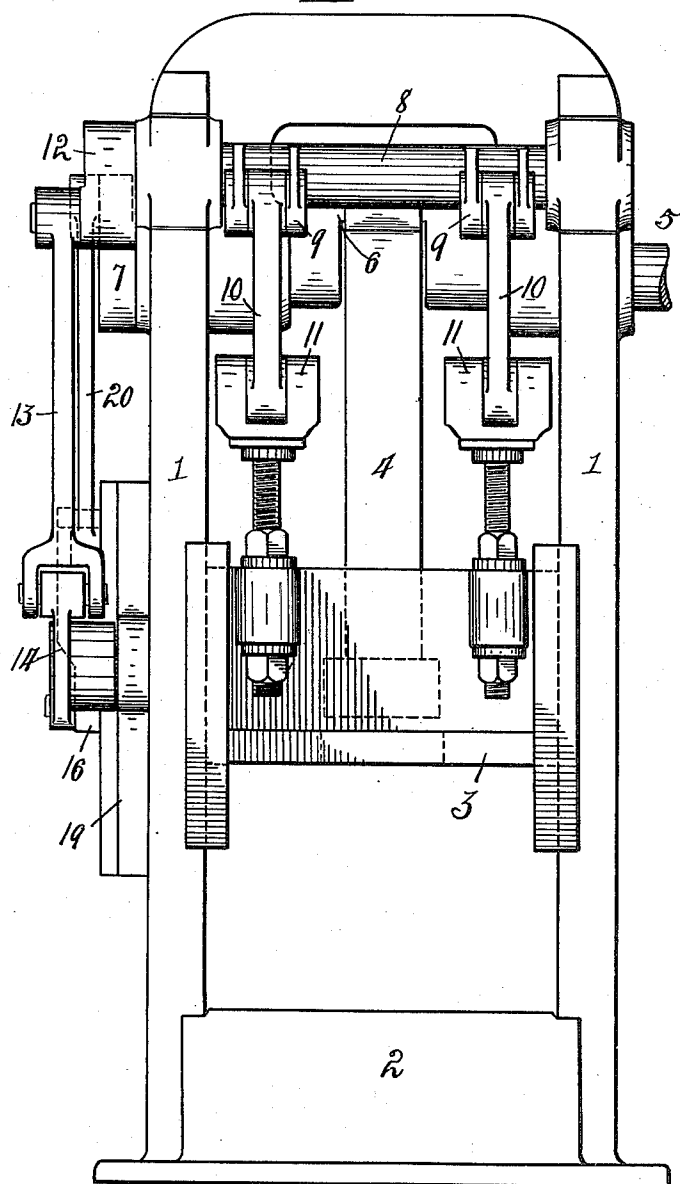


1,013,902.

3 SHEETS—SHEET 1.

Fig. 1.



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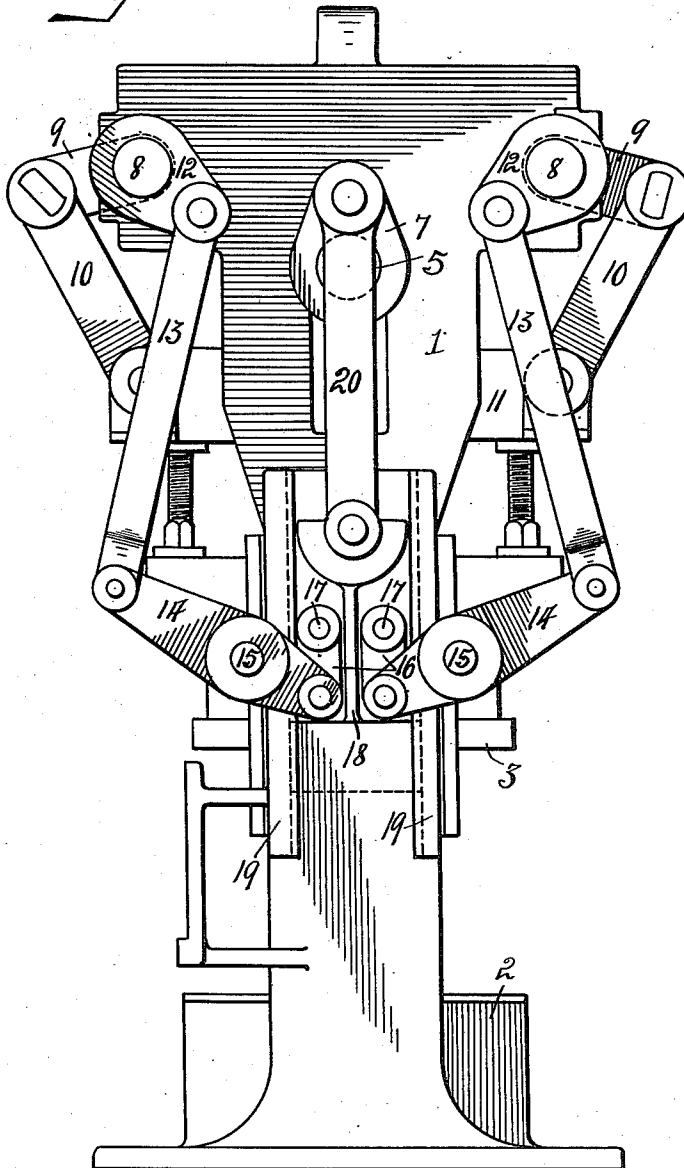
A. H. SEIDEL.
DRAWING PRESS.
APPLICATION FILED OCT. 20, 1911.

1,013,902.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 2.

Fig. 2



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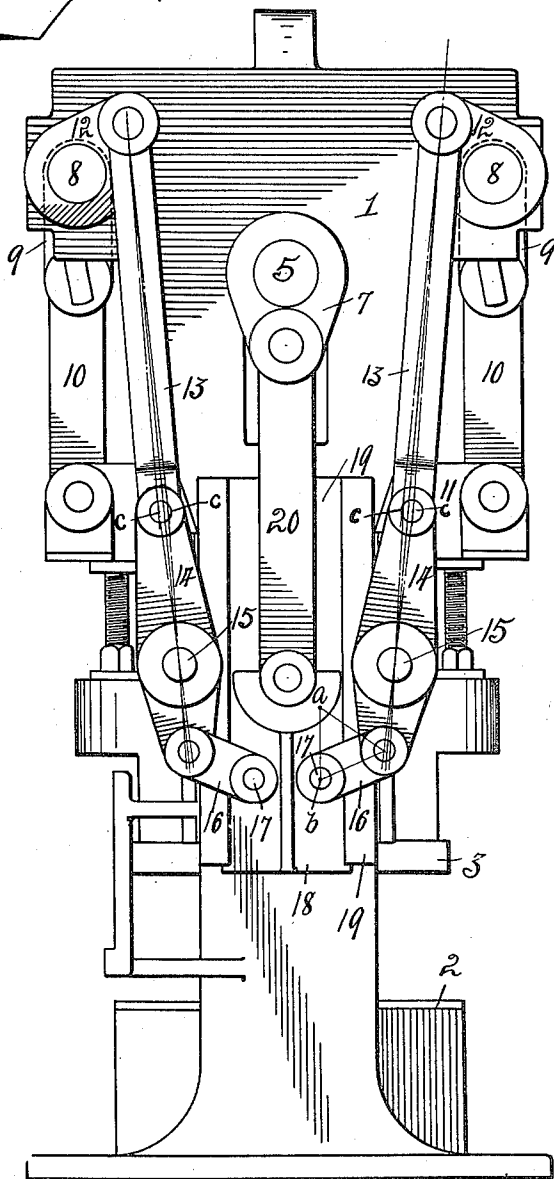
APPLICATION FILED OCT. 20, 1911.

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Patented Jan. 9, 1912.

3 SHEETS—SHEET 3.

Fig. 3.



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DRAWING-PRESS.

1,013,902.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed October 20, 1911. Serial No. 655,814.

To all whom it may concern:

Be it known that I, ADOLPH H. SEIDEL, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Drawing-Press; 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to drawing or toggle presses of the type in which a blank-holder and a plunger or male forming die have differential reciprocatory movements imparted thereto by a drive shaft, whereby the blank-holder precedes the plunger in its engagement of the blank and then dwells or pauses, holding the blank firmly upon the die-block, while the plunger descends to draw the registering portion of the blank into the matrix and then recedes therefrom, after which the blank-holder and plunger ascend together at proper relative speeds, as is well understood in the art.

So far as I am aware the mechanisms employed in most of the presses of this nature for imparting the requisite differential movements to the blank-holder and plunger are objectionable for the reason that the blank-holders thereof do not absolutely dwell or stand at rest during the drawing and receding movements of the plunger, but have slight movements during such actions, which not only effects a wearing of the bearings, but renders them to an extent impractical.

The object of my invention is the provision in a press of this character of a simple and efficient mechanism for imparting the requisite movements to the blank-holder and plunger, which will cause the blank-holder to have an absolute dwell or pause during the blank drawing movement of the plunger and its recession from the matrix, whereby to obviate the objections above noted and to enhance the practicability and commercial value thereof.

The invention is fully described in the following specification, and, while in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment

thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a front elevation of a press embodying my invention with the driving parts removed. Fig. 2 is a side elevation thereof with the blank-holder operating parts in the positions which they assume when the blank-holder is at the limit of its up-stroke, and Fig. 3 is a similar view thereof with the blank-holding operating parts in the positions which they assume when the blank-holder and plunger are at the limit of their respective down-strokes.

Referring to the drawings, 1 designates the body or frame of the press; 2 the die bed, upon which the matrix (not shown) is placed; 3 the blank-holder; 4 the press plunger having a forming head suitable to the matrix; 5 the main driving shaft which is suitably geared to any suitable power for turning the shaft; 6 an inner double crank on the driving shaft which is operatively connected to the press plunger, and 7 an outer crank arm on the driving shaft, which is located on the end of the shaft opposite to that to which the driving means is connected.

Parallel with and on opposite sides of the driving shaft, the frame 1 is provided with the rock-shafts 8, 8, each having a pair of inner rock-arms 9 projecting outwardly in radial alinement, to the free ends of which are pivoted the upper ends of links or connecting rods 10, opposite pairs of which have their lower ends shown as being respectively pivoted to opposite ends of cross-heads 11, from which the blank-holder 3 is suspended in any suitable manner, as well understood in the art.

To projecting end portions of the rock-shafts 8, 8 adjacent to the crank 7 of the driving shaft are respectively secured the outer rock-arms 12, 12, which extend inward at equal angles of, in the present instance, approximately 125° from the rock-arms 9 of their respective rock-shafts 8 whereby to coöperate with said arms and shafts to form bell-crank or angled levers. To the free ends of the rock-arms 12 are pivoted the upper ends of links or connecting bars 13, the lower ends of which are pivotally connected to the outer ends of the longer arms of substantially straight levers 14, which are pivoted respectively, on suitable journal bearings 15, projecting in opposite

spaced relation from the frame side, as shown.

The lower ends of the levers 14, or the free ends of the shorter arms thereof, are respectively pivoted to short links 16, 16, the opposite ends of which pivotally attach, as at 17, 17, to the outer side of a vertically reciprocal block 18. This block has its movements guided in suitable ways 19, 19 provided on the associated side of the press frame and has its upper end connected by a pitman or connecting bar 20 to the crank 7 of the drive shaft, whereby a revolution of the crank arm imparts reciprocal movements to the block 18.

When the plunger and blank-holder are at the limits of their up-strokes the parts of the operating mechanism stand in the positions indicated in Fig. 2 with the block 18 at the limit of its up-stroke, the links 16, 16 hanging vertically from their pivots 17, the levers 14, 14 inclined outward and upward, and the rock-arms 9 and 12 of the shafts 8 respectively projecting outward and inward relative thereto in substantially the angles indicated. Upon a down-stroke of the block 18, communicated thereto by a half revolution of the crank-arm 7 from normal position, the links 16 act upon the opposite levers 14, 14 to place the same and the attached links 13 substantially in longitudinal alinement, which moves the rock-shafts 8, 8 to straighten the attached toggle members 9 and 10 and lower the blank-holder 3 to blank holding position. When the pivots 17 in their descent with the block 18 have approximately reached the points *a* in their travel, the blank-holder has reached the limit of its down-stroke. During the remainder of the down-stroke of the block 18 and link pivots 17, and the return movement thereof to the points *a*, during which time the plunger descends within the matrix and then recedes therefrom, the movement which is communicated by the links 16 to the respective levers 14 is so slight that such movement is entirely lost in the connection between the block 18 and the attached rock-arms 12, thus permitting the blank-holder to remain perfectly stationary during such relative movement of the plunger. The dwell of the blank-holder takes place during the movement of the link pivots 17 from approximately the point *a* to the points *b* and back to the point *a* as indicated in Fig. 3, and the maximum vibration which is imparted to the levers 14 during such movement is indicated by the outer lines *c* on Fig. 3.

It is apparent that by the differentiation in movement between the plunger and the blank holder which is accomplished by the use of my improved control mechanism therefor, an even and firm holding of the blank in place during the period of drawing

is secured, which produces an even and smooth drawing of the blank without the wrinkling or buckling that occurs where there is any relaxation of the pressure of the blank-holder upon the blank during the process of drawing.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. In a drawing-press, a blank-holder, a crank, a reciprocal member movable by said crank, a substantially straight lever having link connection with said member, a second lever having one arm in link connection with the first lever and its other arm in link connection with the blank-holder.

2. In a drawing-press, a blank-holder, a crank, a reciprocal member movable by said crank, a substantially straight lever mounted at one side of the path of movement of said member, a lever having one arm in link connection with an arm of the first lever and its other arm in link connection with the blank-holder, and a link connecting said member and first lever and standing outward from its point of connection with the member when the first lever and the other link attached thereto are substantially in longitudinal alinement.

3. In a drawing-press, a blank-holder, a crank, a reciprocal member movable by said crank, a substantially straight lever mounted at one side of the path of movement of said member and having one arm longer than the other, a lever having one arm in link connection with the longer arm of the first lever and its other arm in link connection with the blank-holder, and a link connecting the shorter arm of the first lever to said member and standing outward from its point of connection with the member when the first lever and the other link attached thereto are substantially in longitudinal alinement.

4. In a drawing-press, the combination of a blank-holder, a pair of oppositely disposed bell-crank levers, a second pair of oppositely disposed substantially straight levers, means connecting one arm of each of one pair of levers with an arm of respective levers of the other pair, means connecting each bell-crank lever with the blank-holder, a reciprocal member, and means connecting said member to an arm of each of the straight levers to rock the same when the member is moved.

5. In a drawing-press, the combination of a blank-holder, a reciprocal member, means to reciprocate said member, a pair of oppositely disposed levers, a pair of oppositely disposed substantially straight levers, links

connecting said members with the straight levers, means connecting one arm of each lever of one pair with an arm of each lever of the other pair, and means connecting the
5 angled levers with the blank-holder.

6. In a drawing-press, the combination with a blank-holder, of a crank, a member reciprocally movable by said crank, substantially straight levers fulcrumed at opposite
10 sides of the path of movement of said member, links connecting the lower arms of said levers to said member and standing outward from the member when the levers are in up-

right blank-holder dwelling position, a pair of angled levers, one arm of each having
link connection with the blank-holder and
the other arm of each having connection
with the upper ends of said first levers. 15

In testimony whereof, I have hereunto signed my name to this specification in the
presence of two subscribing witnesses. 20

ADOLPH H. SEIDEL.

Witnesses:

LOUIS J. HINDES,
CHAS. W. GREENING.