W. KLOCKE.

DRAWING PRESS.

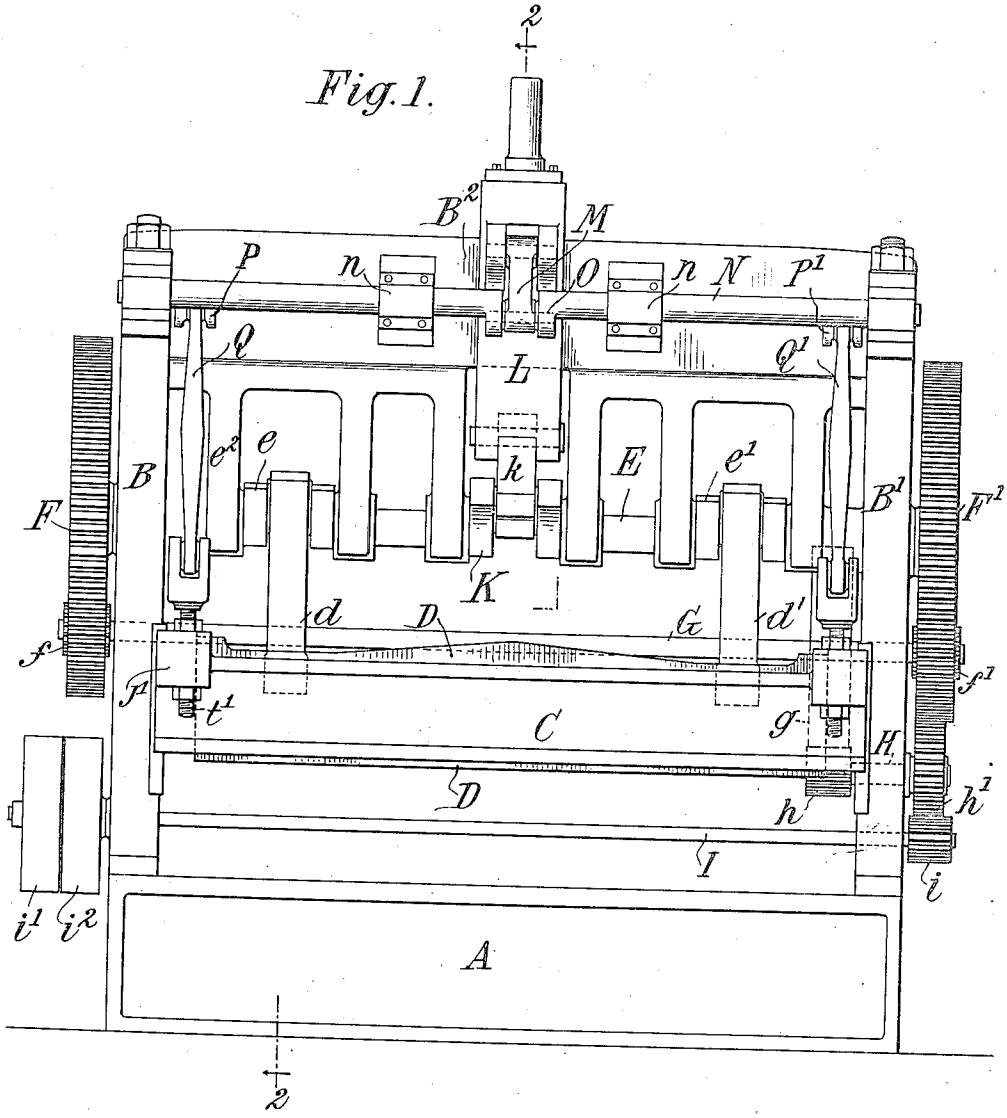
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1,132,018.

Patented Mar. 16, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

René Bruine

Fred White

INVENTOR:

William Klocke,

By Attorneys,

Fraser, Turk & Myers

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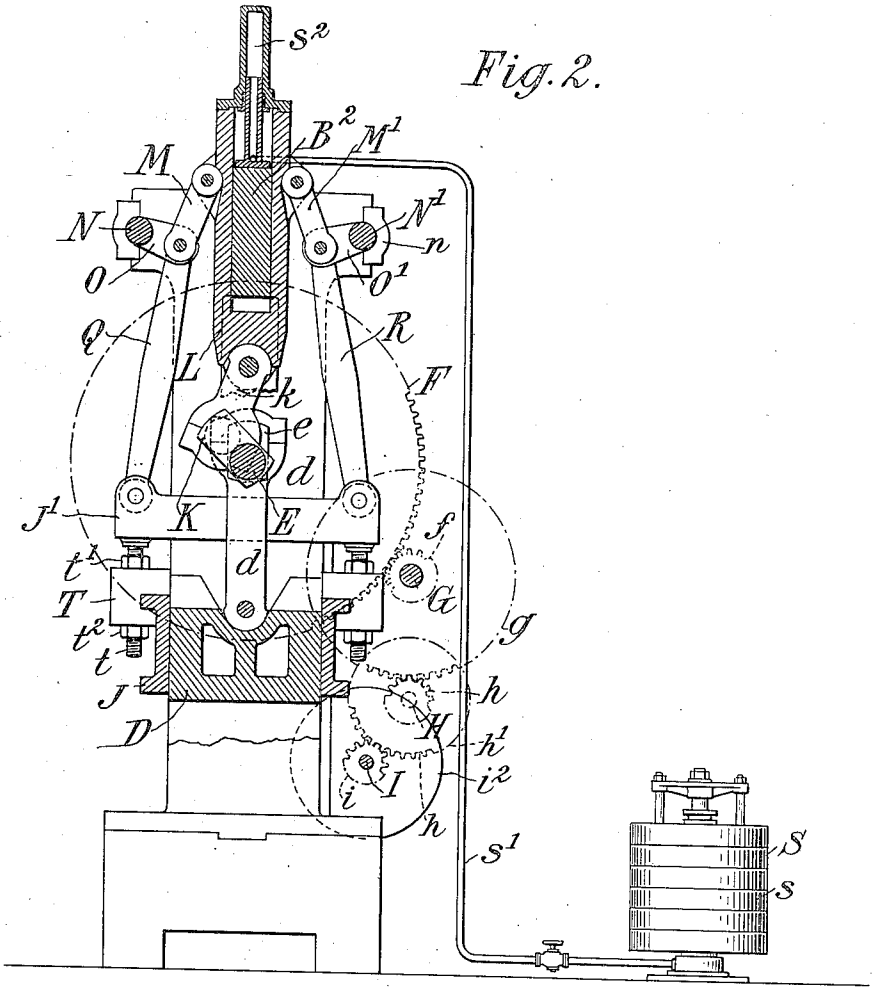
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2 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

Rene' Bruine

Fred White

INVENTOR :

William Klocke,

By Attorneys,

Fraser, Turk & Myers

UNITED STATES PATENT OFFICE.

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

DRAWING-PRESS.

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Application filed September 2, 1914. Serial No. 859,788.

To all whom it may concern:

Be it known that I, WILLIAM KLOCKE, a citizen of the United States, residing in Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Drawing-Presses, of which the following is a specification.

My invention relates to double-acting drawing presses of the type illustrated in my Letters Patent No. 955,173, dated April 19, 1910. In presses of this character the blank-holder is usually brought down to hold the blank and the punch reciprocates within the blank-holder to perform its function.

The object of my invention is to simplify the construction of such machines, to reduce the number of operative parts and to dispense with slides and links heretofore employed, much of which was situated outside the side frames of the machine and were expensive, cumbersome and added to the complication of the machine without increasing its efficiency.

A further object of my invention is to reduce the torsional strain upon the shafts.

A desirable form in which my invention may be embodied is illustrated in the accompanying drawing, wherein:

Figure 1 is a side elevation of a machine embodying my invention; and Fig. 2 is a vertical section thereof on line 2—2 of Fig. 1.

I have illustrated my invention as embodied in a machine wherein a base A is provided with side frames B B^1 and a bed C, upon which suitable dies are secured for the work in hand.

A plunger D is provided and carries upon its lower face the usual male dies or punches which are to be used. This plunger is connected by links d d^1 to the cranks e e^1 upon the main driving shaft E. This has bearings in the side frames B B^1 and intermediate bearings in hangers e^2 of which six are illustrated. Motion is communicated to this shaft from gears F F^1 which are driven by pinions f which are fixed upon a shaft G which extends entirely across the machine and has a pinion f upon each end meshing with each of the gears F F^1. Shaft G is turned by gear g fixed thereon which meshes with pinion h on shaft H upon which is a gear h^1 which meshes with a pinion i upon driving shaft I upon which are fast and loose pulleys i^1 i^2.

The plunger D reciprocates within the blank-holder J, and an important feature of my invention is the means whereby this blank-holder is reciprocated. Upon the main shaft E is a crank K which is connected by a link k to a slide L which is guided upon the top cross-bar B^2 which connects the side frames B B^1. This slide is connected by links M M^1 to arms O O^1 on rock-shafts N N^1. These rock-shafts have bearings in the side frames B B^1 and in bosses n of the top cross-bar B^2. At or near the ends of these rock-shafts are located arms P P^1, of which two are shown in Fig. 1. These are duplicated on the other side of the machine. The arms P^1 P^1 are pivotally connected respectively to links Q Q^1 R R^1, and said arms together with said arms O O^1 P P^1 and the links Q Q^1 R R^1 constitute four toggles which are respectively situated at substantially the corners of the upper part J^1 of the blank-holder J, to which the links Q Q^1 R R^1 are pivotally connected. The links M M^1 are duplicated, one for the front of the machine and one for the back thereof, and are in effect connected to the pivots of the toggles so that they operate to straighten the toggle to enable the blank-holder to perform its holding function. The rock-shafts N N^1 form abutments which furnish the resistance necessary to permit the blank-holder to perform its function and relieve the moving parts M M^1, the slide L and its connected parts from strain. The toggles are alined in two pairs, the toggles in each pair located at about the same distance from the operating links M M^1 whereby strain on the shafts or abutments N N^1 is equalized.

An important feature of my invention is the described means for moving the blank-holder. The crank K is situated substantially midway of the main shaft E, and the links M M^1 are substantially midway of the rock-shafts N N^1. By this means, these respective shafts are relieved from torsional strain, which is substantially equalized.

By a comparison of the machine embodying my invention with machines heretofore made wherein slides were employed upon the said frames, it will be perceived that a large reduction has been effected in the number of shafts, pins, cleats, etc., necessary to

enable the machine to perform its duty. Thereby the construction of the machine is simplified and greatly cheapened; the machine is lightened and fewer parts are provided to get out of order; and all this is accomplished without interfering with the efficiency of the machine, which, on the contrary, is improved.

I prefer to provide my machine with a counterbalance to balance the weight of the blank-holder and its connected parts, and for this purpose I have illustrated an accumulator S which is provided with the usual weights s and has a pipe s^1 which communicates with a chamber s^2 within the upper end of the slide L. The water or other liquid being forced by the weights L into the chamber s^2 and reacting against the resistance of the top frame B^2 assists in lifting the slide and blank-holder and connected parts.

Means are provided for adjusting the blank-holder to its upper frame J^1, and such means may take the form usually employed for this purpose. As shown, bosses T upon the blank-holder are perforated to receive a bolt t, connected to frame J^1 and upon which are nuts t^1 t^2, by which the blank-holder J may be adjusted relatively to its upper frame J^1.

The accompanying drawings illustrate in Fig. 1 the arms P P^1 which constitute the upper member of the blank-holder actuating toggles. These arms are connected to the rock-shafts N N^1 at or near the ends thereof and are not seen in Fig. 2, being of the same size and shape and extending in the same direction as arms O O^1.

It is not to be inferred by the particularity with which the machine containing my invention has been described that the construction described is essential, as it will be obvious that my invention as described hereinafter in the claims will be equally well embodied in machines following other constructions and containing equivalent devices for those employed. Likewise the construction of those parts constituting my invention may be modified or altered and equivalent parts substituted within the limits of the appended claims.

What I claim is:—

1. In a press, a main shaft, a blank holder and operative connections therefrom to said main shaft, including a crank located substantially midway of said main shaft, a plunger, and operative connections between said main shaft and said plunger, connected to the main shaft each side of said blank holder crank.

2. In a press, a main shaft, a blank holder, toggles for operating the blank holder, and a crank located substantially midway of said main shaft and having an operative connection with said toggles, a plunger and cranks on said main shaft on each side of said blank holder crank for operating said plunger.

3. In a press, a main shaft, a blank holder, toggles for operating the blank holder, a link for operating each toggle and a crank located substantially midway of the main shaft operatively connected to said link, a plunger and cranks on said main shaft on each side of said blank holder crank for operating said plunger.

4. In a press, a plunger, a main shaft and operative connections between said parts, a blank holder and operative connections therefrom to said main shaft including a crank located substantially midway of said main shaft, a slide connected to said crank, alined toggles connected to said blank holder and to an abutment and located substantially equidistant from said slide and an operative connection between said slide and said toggles.

5. In a press, a main shaft, a blank holder and operative connections therefrom to said main shaft, including a crank located substantially midway of said main shaft, a slide connected to said crank, oppositely disposed toggles connected to said blank holder and to abutments and a link on said slide connected to said toggles, a plunger and cranks on said main shaft on each side of said blank holder crank for operating said plunger.

6. In a press, a plunger, a main shaft and operative connections between said parts, a blank holder and operative connections therefrom to said main shaft including a crank located substantially midway of said main shaft, a slide connected to said crank, a pair of alined toggles connected to said blank holder at both the front and rear sides of said slide, abutments for said toggles and links on the slide operatively connected to said toggles.

7. In a press, a plunger, a main shaft and operative connections between said parts, a crank located substantially midway of said main shaft, a slide connected to said crank, a rock shaft on each side of said slide, rocking connections from said slide to said rock shafts, a blank holder, and alined toggles between each of said shafts and said blank holder located at each side of said rocking connections and substantially equidistant therefrom.

8. In a press, a main shaft, driving connections at each end thereof, a blank holder and operative connections therefrom to said main shaft, including a crank located substantially midway of said main shaft, a slide connected to said crank, alined toggles connected to said blank holder and to an abutment and located substantially equidistant from said slide, an operative connection between said slide and said toggles, a plunger and cranks on said main shaft on

each side of said blank holder crank for operating said plunger.

9. In a press, a plunger, a main shaft and operative connections between said parts, a blank holder and operative connections therefrom to said main shaft, including a crank located substantially midway of said main shaft, a slide connected to said crank, a rock-shaft, alined toggles between said rock-shaft and said blank holder and a link connected to said slide and an arm located substantially midway of said rock-shaft and connected to said link.

10. In a press, a plunger, a main shaft and operative connections between said parts, a blank-holder, a rock-shaft and an operative connection between said rock-shaft and said main shaft located substantially midway of both said shafts, and operative connections between said rock shaft and said blank-holder located at each side of the middle of said rock-shaft, and substantially equidistant therefrom.

11. In a press, a plunger, a main shaft, driving means therefor at each end thereof, and direct operative connections between said plunger and main shaft located at each side of the center of said shaft, a rock-shaft and an operative connection thereto from said main shaft located substantially midway of both said shafts and operative connections between said rock-shaft and said blank-holder, located at each side of the middle of said rock-shaft and substantially equidistant therefrom.

12. In a press, a plunger, a main shaft, crank arms on each side of the middle of said main shaft for driving said plunger, a crank located substantially midway of said main shaft, a slide connected to said crank, parallel rock-shafts located at the front and rear of said slide respectively, rocking connections from said slide to said rock-shafts connected substantially midway of said rock-shafts, a blank-holder, and toggles between each of said rock-shafts and said blank-holder located at each side of said rocking connections.

13. In a press, a main shaft E, driving connections at each end thereof, a crank K located substantially midway in said shaft, a blank-holder, actuating toggles connected to the same at or near the corners thereof, rocking abutments for said toggles extending substantially parallel with said main shaft, means connected to said rocking abutment at a substantially midway point therein and to said crank, for rocking said abutment, a plunger and cranks on said main shaft on each side of the crank K directly connected to said plunger for operating the same.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM KLOCKE.

Witnesses:
H. C. SEAMEN,
J. D. W. LAPE.