

Nov. 27, 1923.

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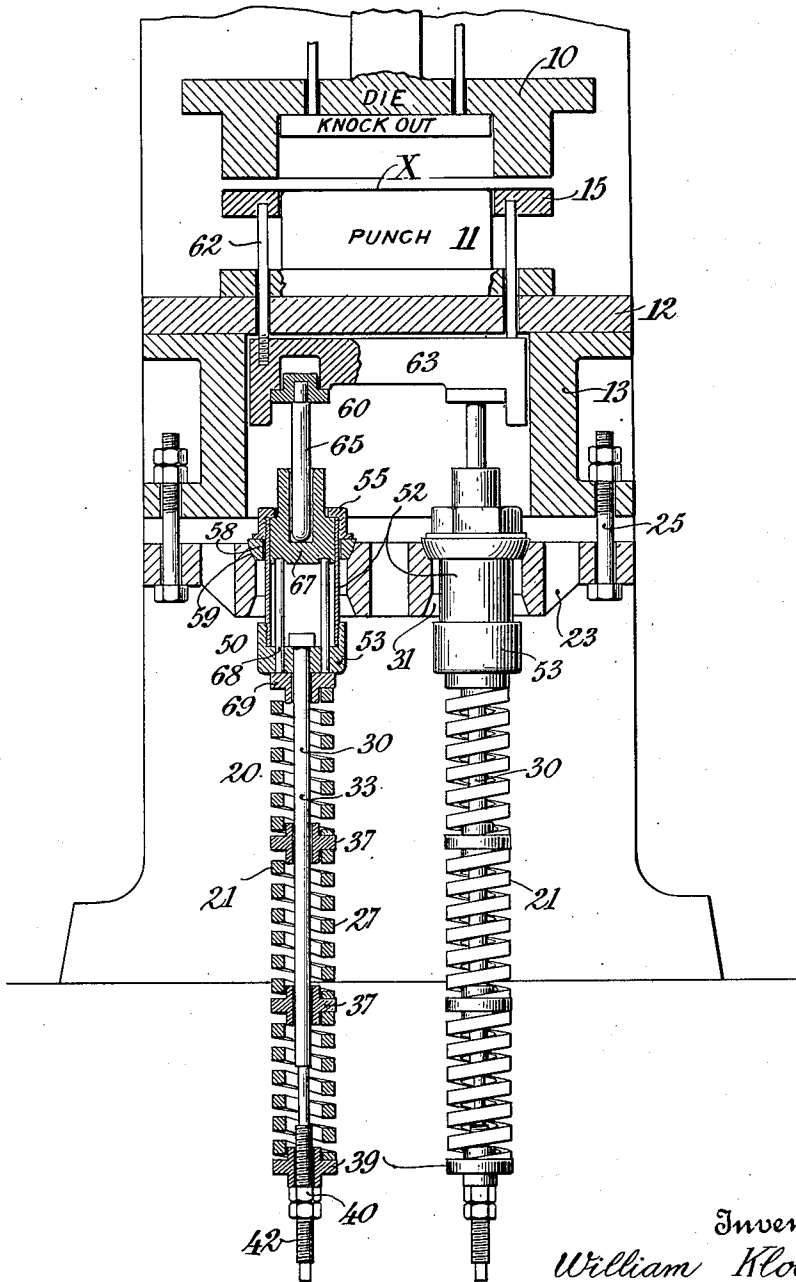
W. KLOCKE

PRESS HAVING SPRING PRESSED BLANK HOLDERS

Filed June 30, 1921

2 Sheets-Sheet 1

Fig. 1.



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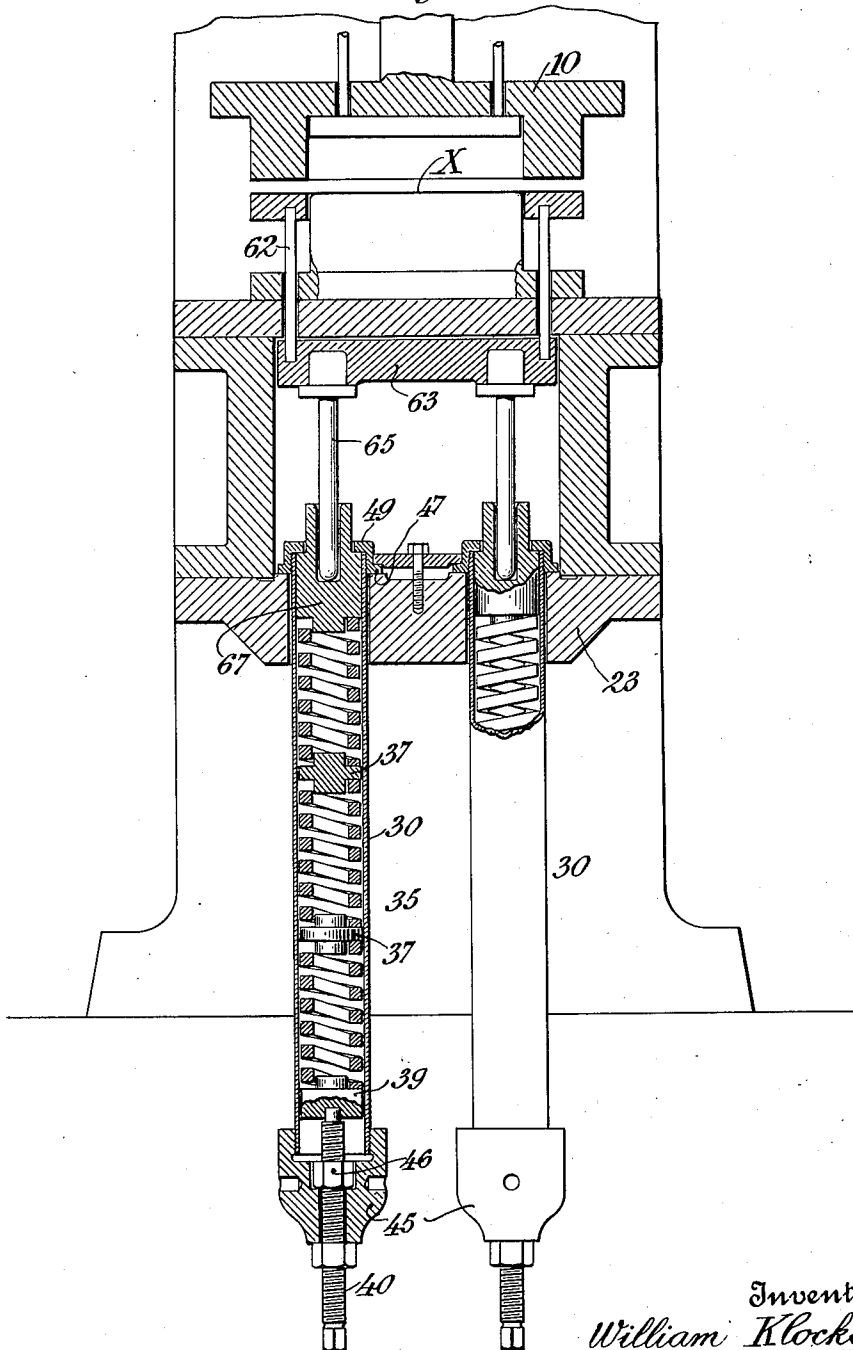
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2 Sheets-Sheet 2

Fig. 2.



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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.

PRESS HAVING SPRING-PRESSED BLANK HOLDERS.

Application filed June 30, 1921. Serial No. 481,683.

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 county of Queens, city and State of New York, have invented certain new and useful Improvements in Presses Having Spring-Pressed Blank Holders, of which the following is a specification.

This invention relates to drawing presses of the spring pressed blank holder type, and aims to provide improvements therein.

The invention provides a drawing press of the character in question in which the resistance of the blank-holder at different points thereof may be readily, precisely and extensively varied, whereby the resistance of the blank holder may be nicely adjusted to the requirements of work of various shape.

The invention further provides a mechanism which may be readily changed for spring pressures beyond or less than the range of adjustment or strength of the spring mechanism which may be in use at any particular time, and which may further admit of the change being made without the workman getting beneath the press or into a pit below the press.

The invention further provides a mechanism which is relatively simple and inexpensive, which may be composed largely of simple parts readily procured in the market or manufactured, and which may be applied as an attachment to existing presses.

The invention further provides a novel combination of parts, as herein more fully described.

Two embodiments of the invention are illustrated in the accompanying drawings, in which,—

Figure 1 is a view in section of a press comprising the invention, only such parts of the press being shown as are necessary to disclose the invention.

Fig. 2 is a similar view of a second embodiment of the invention.

Referring to said drawings, numerals 10 and 11 illustrate the complementary forming parts of the press, the part 10 being here shown as a die, and the part 11 as a punch, and the die is here shown as movable toward and from the punch by suitable mechanism (not shown). The punch is here

shown as mounted upon a fixed part of the press, as for example, a bolster plate 12 resting on the bed 13.

15 indicates a blank holder adapted to press the marginal portion of the sheet of metal X against the die during the action of the punch against the sheet X, to prevent said marginal portion from buckling, and wrinkles being formed in the drawn article.

Means 20 for resisting the movement of the blank holder is provided, and this means conveniently comprises one or more spring mechanisms 21, and preferably a plurality of said spring mechanisms 21, especially where differential resistance is to be imparted to a circumferential portion of the blank holder 15. The spring mechanisms 21 are conveniently supported at one end from a frame or beam 23, attached to and preferably formed separate from the bed 13. The separate frame 23 is conveniently attached to the bed 13 by means of threaded bolts or the like 25, by means of which the position of the frame 23 may be changed or adjusted as hereinafter more fully explained. The springs 27 of the spring mechanism are connected, at the lower ends, to the said support or frame 23 by means of suitable tie pieces 30. These tie pieces conveniently project through openings 31 in the frame 23 and conveniently allow the spring mechanism to be withdrawn through the upper side thereof. This feature is of advantage in putting in, and taking out, and adjusting the spring mechanisms where long springs are employed, which springs conveniently project into pits provided below the bottom of the press or floor level.

Moreover, inasmuch as spring pressures of various strength and character are required for doing different work, the spring mechanisms are conveniently of a character which admit of replacement of the springs by different size springs, or by longer or shorter springs. To this end, the tie pieces are conveniently in the form of readily procurable and formed parts, such as the threaded rod 33, Figure 1, or the pipe or tube 35, Figure 2. These pipes or rods are ordinary articles in the market and are readily cut to the proper length and fitted to the spring mechanism.

Moreover, the springs are conveniently

made in sections, as shown, collars or followers 37 being conveniently placed between the several sections.

The lower end of the spring preferably bears upon a collar 39 and suitable adjusting means 40 is provided for adjusting the position of the collar 39 and the tension of the spring. In the construction shown in Figure 1, the adjusting means is conveniently in the form of a nut threaded upon screw threads 42 formed on the rod 33, and in Figure 2 the said means 40 is conveniently in the form of a threaded screw engaging threads in a cap 45 threaded upon the lower end of the pipe 35. The threads in the cap 45 are conveniently formed in a nut 46 seated in a recess in the said cap 45.

In the embodiment shown in Fig. 2, the tie piece 30 abuts against the frame 23 through a shoulder 47 conveniently a part of a cap or annulus 49 threaded upon the pipe 35. In the construction shown in Figure 1, the tie piece 30 conveniently abuts the frame 23 through a hanger or stirrup 50. The stirrup 50 is conveniently in the form of a short pipe or tube 52 having a lower cap 53 to which one end of the rod 33 is connected, and an upper cap or annulus 55, bearing on the frame 23, conveniently through a ball ring 58 seated upon a ball seat 59 in the support 23, and thus enables the spring mechanism 20 to have limited universal movement. The embodiments shown in Figures 1 and 2 show that the spring mechanism 21 may or may not be supported in the frame 20 so as to have universal movement, as may be desired.

The resistance of the spring mechanism 20 is transmitted to the blank holder 15 by any suitable mechanism 60. This mechanism may conveniently comprise a plurality of pins 62 bearing at opposite ends against the blank holder 15, and a plate 63, respectively.

A plurality of pins 65, one for each spring mechanism 20 conveniently bear against the underside of the plate 63, the slide 67 bearing upon one end of the springs, directly as in the embodiment of Fig. 2, and indirectly through pins 68 and a collar 69, as in the embodiment shown in Figure 1.

To adjust the device so that a greater (or less) resistance may be imparted to the blank holder 15 at the desired point than at other points, one or more of the bolts 25 may be turned to draw the support 23 toward or from the bed, thereby imparting greater or less tension to the adjacent spring mechanisms. By reasons of the ball and socket joint between the support 23 and spring mechanisms, the said spring mechanisms can adjust themselves in the seats 59, so as that the springs may react in a substantially direct line to the pressures im-

parted to the blank holder 15. Buckling or side thrusts of the springs are thereby avoided and the consequent irregularity of the spring action is thereby avoided.

Adjustment of the resistance of the blank holder at certain points may also be obtained, together with, or independently of, adjusting means 25, by means of the adjusting means 40, or by replacement of one spring mechanism by another, which spring mechanism may be different from its associated spring mechanisms. By varying the resistance offered by the several spring mechanisms 20 a differential pressure at relatively precise or definite points of the blank holder 15 may be obtained, which result could not be obtained by adjustments common to the several spring mechanisms, as for example such adjustment as is effected by the means 25.

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

What is claimed is:

1. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support and a plurality of springs between said blank-holder and spring support, means in conjunction with individual springs for adjusting the force or resistance thereof, whereby greater resistance may be imparted to said blank-holder at predetermined points than at other points, said spring support comprising a frame common to a plurality of said springs, and means for adjusting the position of said frame, whereby the force or resistance of the several springs bearing therein, may be simultaneously varied.
2. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support and a plurality of springs between said blank-holder and spring support, means in conjunction with individual springs for adjusting the force or resistance thereof, whereby greater resistance may be imparted to said blank-holder at predetermined points than at other points, said spring support comprising a frame common to a plurality of said springs, and means for adjusting the position of said frame, whereby the force or resistance of the several springs bearing therein, may be simultaneously varied, said springs projecting below said frame.

3. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie piece for individual springs attached at its

upper end to said spring support, and having an abutment at its lower end for one end of said spring.

4. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said spring support and tie-piece having a connection permitting removal of said tie-piece and springs through said spring support.

5. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said abutment being adjustable on said tie-piece.

6. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a replaceable part, replaceable for springs of different length.

7. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod and a hanger to which said rod is attached at one end.

8. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, and a hanger to which said rod is attached at one end, said hanger having a bearing capable of universal movement.

9. A drawing press comprising a blank

holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, a hanger to which said rod is attached at one end, a collar guided on said hanger, against which said spring bears, and connections between said blank holder and collar.

10. A drawing press comprising a blank-holder, and means for resisting the movement of said blank holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, a hanger to which said rod is attached at one end, a collar guided on said rod, against which said spring bears, and connections between said blank-holder and collar, said connections comprising a pin passing through said hanger.

11. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, a hanger to which said rod is attached at one end, a collar guided on said rod, against which said spring bears, connections between said blank-holder and collar, said hanger comprising a short tube and end pieces adapted to bear on a part of the press frame, and to receive the end of said rod.

12. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of springs reacting separately at different points against said blank-holder, a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, a spring supporting collar at the lower end of said rod, and means for adjusting the position of said collar on the end of said rod.

13. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a spring support, a plurality of

- springs reacting separately at different points against said blank-holder, and a tie-piece for individual springs attached at its upper end to said spring support, and having an abutment at its lower end for one end of said spring, said tie-piece comprising a rod, a plurality of collars thereon, and said spring being in sections spaced between said collars.
- 10 14. A drawing press comprising a blank-holder, means for resisting the movement of said blank-holder, and means for transmitting the motion of said blank-holder to said resisting means, said latter means comprising
- 15 a coil spring, having its axis substantially in line with the line of motion of said transmitting means, a spring support, and a bearing between said spring and spring support permitting universal movement whereby said
- 20 support may adjust itself to bring the axis of said spring in close alinement with the line of action of said transmitting means.
15. A drawing press comprising a blank-holder, means for resisting the movement of
- 25 said blank-holder, and means for transmitting the motion of said blank holder to said resisting means, said latter means comprising a coil spring, having its axis substantially in line with the line of motion of said
- 30 transmitting means, a spring support, a tie-piece, and a bearing between said support and spring mechanism permitting universal movement whereby said support may adjust itself to bring the axis of said spring in close alinement with the line of action of said transmitting means.
16. A drawing press comprising a blank-holder, means for resisting the movement of said blank-holder, and means for transmitting the motion of said blank-holder to said
- 40 resisting means, said latter means comprising a coil spring, having its axis substantially in line with the line of motion of said transmitting means, a spring support, a tie rod, a hanger, and a bearing between said hanger and support permitting universal movement whereby said
- 45 support may adjust itself to bring the axis of said spring in close alinement with the line of action of said transmitting means.
17. A drawing press comprising a blank-holder, and means for resisting the movement of said blank-holder, said means comprising a plurality of spring mechanisms, reacting separately at different points
- 55 against said blank-holder, means for adjusting the resistance of individual spring-mechanisms, and means for simultaneously adjusting the resistance of a plurality of said spring mechanisms.
- 60 In witness whereof, I have hereunto signed my name.
- WILLIAM KLOCKE.