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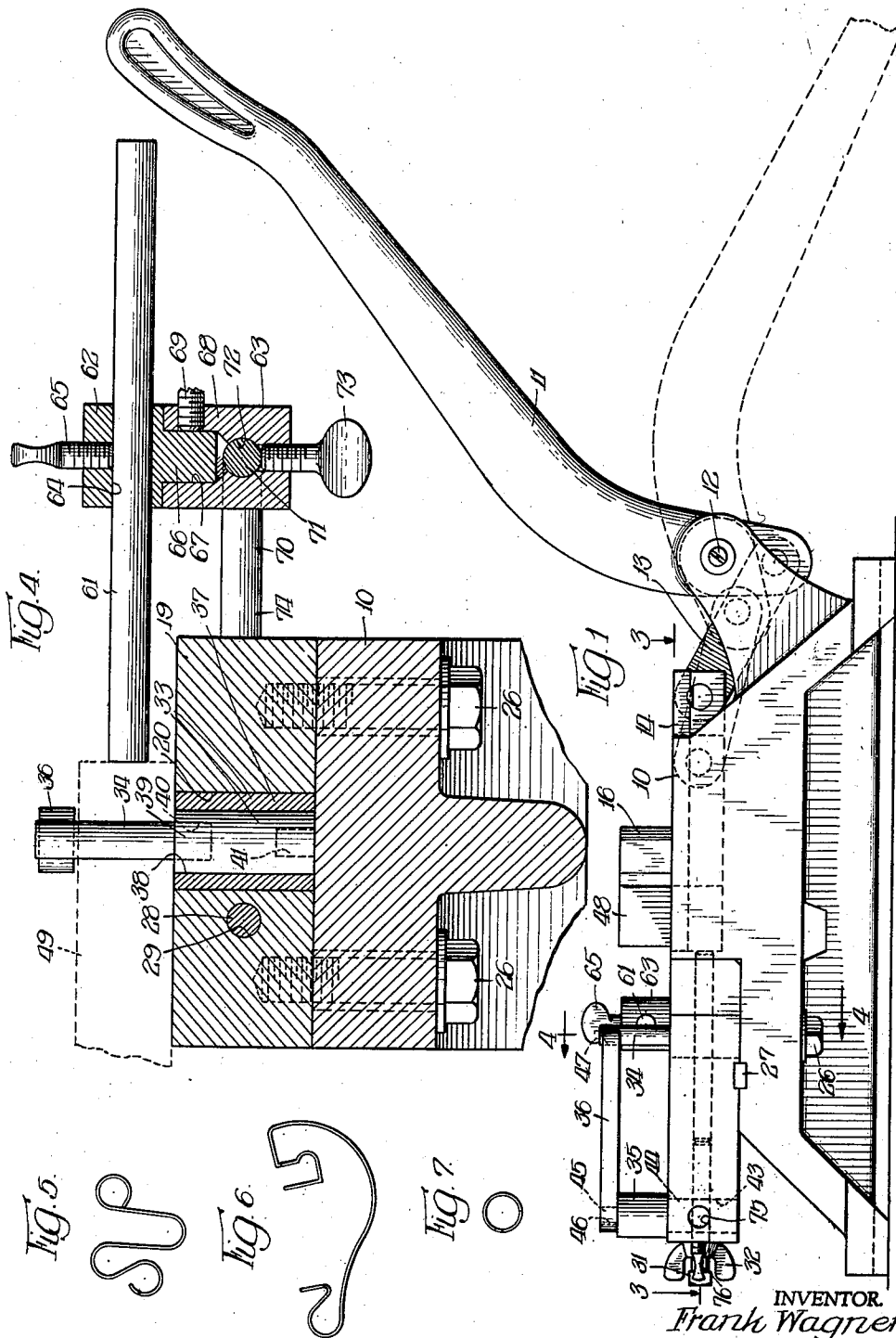
F. WAGNER

2,277,360

HAND PRESS ATTACHMENT

Filed Jan. 11, 1939

3 Sheets-Sheet 1



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March 24, 1942.

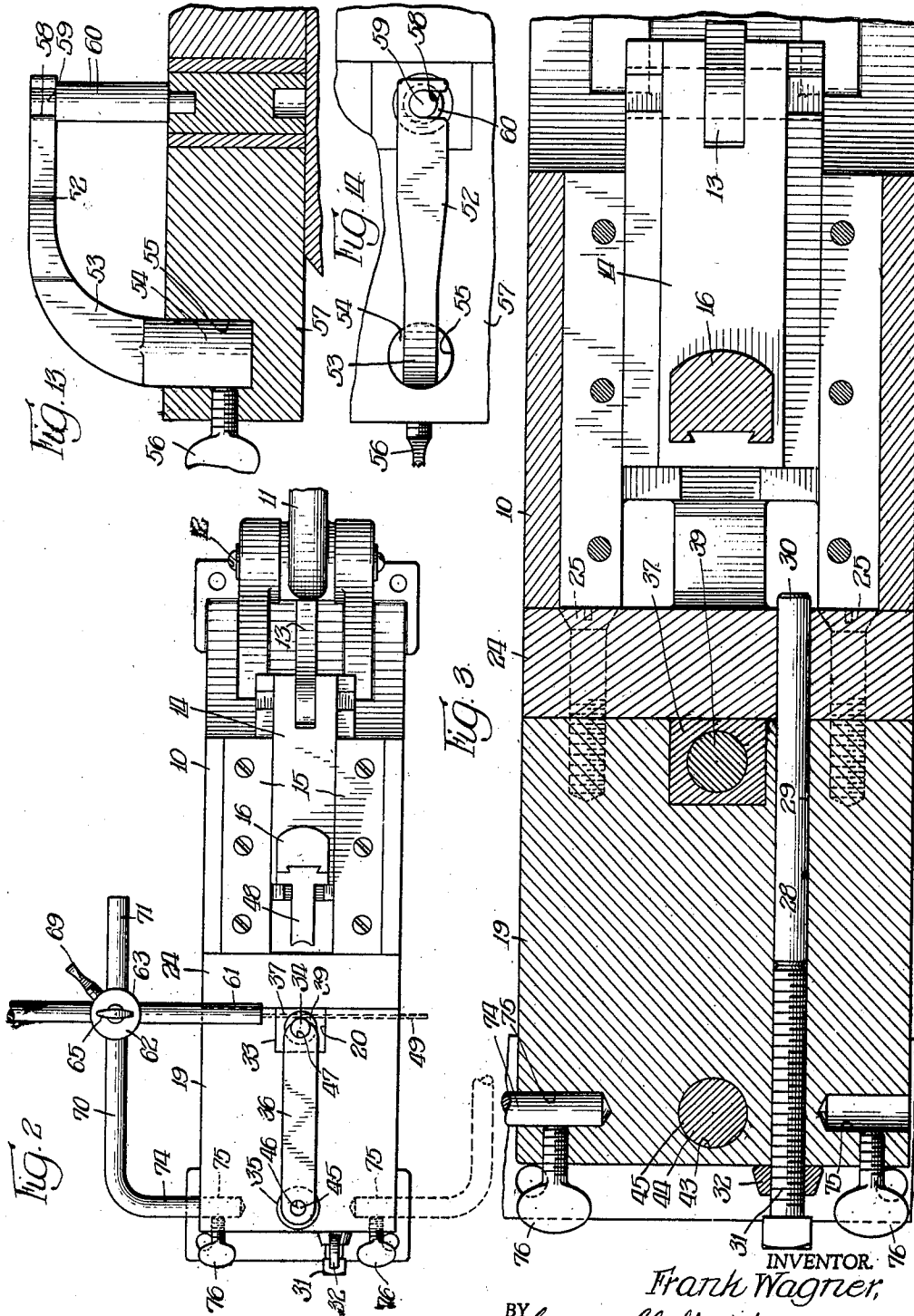
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3 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,277,360

HAND PRESS ATTACHMENT

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Application January 11, 1939, Serial No. 250,392

3 Claims. (Cl. 153—48)

This invention has to do with hand presses of the type ordinarily used by printers, finishers, box makers, carton makers and others in bending strips of thin sheet metal rule into various shapes, and is particularly concerned with the provision of a special attachment for use in bending such rule into small circles and other difficult shapes.

The principal object of the invention is to provide, in connection with a hand press of the type described, a special attachment which can be quickly applied to the press and used to bend small intricate shapes not otherwise practicable with the press, and which when in place in the press will not take up any of the regular working space and will not interfere with the throw of the hand operated toggle linkage or other mechanism used in applying power to the die carried by the movable die holder.

While the foregoing statements are indicative in a general way of the nature of the invention, other more specific objects and advantages will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and operation of the new attachment.

A preferred embodiment of the invention is presented herein for the purpose of exemplification, but it will of course be appreciated that the invention is susceptible of incorporation in other structurally modified forms coming equally within the scope of the appended claims.

In the accompanying drawings:

Fig. 1 is a side view of a press equipped with the improved bending attachment;

Fig. 2 is a plan view of the press;

Fig. 3 is a horizontal section through the base of the press, taken on the irregular line 3—3 of Fig. 1;

Fig. 4 is a vertical transverse section, taken on the line 4—4 of Fig. 1;

Figs. 5, 6 and 7 are plan views of sheet metal strips bent into various forms by means of the attachment;

Fig. 8 is another plan view of the press, with the special bending attachment removed;

Fig. 9 is a perspective view of the stationary die holder in which one of the regular bending dies is adapted to be mounted;

Fig. 10 is a perspective view of the assembly which is substituted for the stationary die holder when the special bending attachment is being used, the view showing in addition to the regular parts two extra bending dies of graduated size for optional employment;

Fig. 11 is a perspective view of a special substitute part for use in bending small squares or other small sharp cornered forms not readily possible with an ordinary sharp cornered die when such a die is mounted in the regular stationary die holder;

Fig. 12 is a perspective view of a set of graduated back-thrust bars which form a part of the bending attachment;

Fig. 13 is a vertical longitudinal section through the rear part of a press equipped with a bending attachment of somewhat modified form; and

Fig. 14 is a plan view of the modified attachment shown in Fig. 13.

Except for the addition of the special bending attachment, the press shown in the drawings is quite similar, both in construction and in operation, to the press disclosed in Lorch Patent No. 1,478,443. The press (which is shown in Fig. 8 with the special bending attachment removed) includes an elongated rectangular frame 10 which is adapted to be placed on a work bench or other support of convenient height. The press is operated by a hand lever 11 which is pivoted at 12 to the front end of the frame and is connected by a toggle link 13 to the front end of a slidably mounted cross head 14. The cross head 14 is positioned between two guide strips 15 for reciprocable movement longitudinally of the frame, and is provided at its rear end with an upstanding die holder 16 having a dove-tailed slot 17 in which a bending die 18 of any desired configuration is detachably secured.

A bed plate 19 is rigidly secured to the rear end of the frame, and is provided with a socket 20 of rectangular cross section in which a stationary die holder 21 of corresponding cross section is removably seated. The stationary die holder 21 is located behind the reciprocable die holder 16 directly in the line of movement of the latter, and is provided with a dove-tailed slot 22 in which a die 23 complementary to the die 18 is detachably secured. The socket 20 is preferably milled in the front edge of the bed plate 19 and completed by a cross strip 24 which forms the front part of the bed. The cross strip 24 may be fastened to the bed plate 19 by screws 25, and the bed plate 19 may be fastened to the frame 10 by bolts 26 and secured against longitudinal movement on the frame by a transverse locking key 27. The extent of movement of the reciprocable die holder 16 toward the stationary die holder 21 may be adjusted within close limits by a pin 28 in a hole 29 formed in both the bed

plate 19 and cross strip 24, the pin 28 having its front end 30 disposed in the path of movement of the cross head 14 and being adjustably positioned in the hole 29 by a set screw 31 in the threaded rear end of the hole. The set screw can be locked in any desired position of adjustment by means of a wing nut 32. This adjustment, which is common in presses of this type and forms no part of the invention, enables the operator to bring the bending dies together to exactly the same extent on each stroke of the hand lever 11 when making a number of bends of the same size, either in the same piece of rule or in several identical pieces.

The present invention resides in making the regular stationary die holder 21 removable and in providing a special bending attachment which can be easily and quickly applied to the press upon removal of the die holder 21. This new attachment includes an adapter 33 for supporting a die 34 of relatively small cross section, a bracing post 35, and a back-thrust bar 36. The adapter 33 may be formed in two parts—namely, an outer part 37 of rectangular cross section which is provided with a center bore 38, and an inner part 39 of circular cross section which is provided in its opposite ends with small center bores 40 and 41 of different diameters. The outer part 37 of the adapter is designed to fit snugly within the socket 20 flush with the working surface of the bed plate 19, the inner part 39 is designed to fit snugly within the bore 38 of the outer part, likewise flush with the working surface of the bed plate, and the die 34 is designed to fit snugly within the upper bore 40 of the inner part in upwardly projecting relation to the bed plate.

If a die 34 of smaller or larger size is to be used (for instance, the larger die 42 shown in Fig. 10), the inner part 39 of the adapter is reversed end for end to present the larger bore 41, and the lower end of the larger die is inserted in that bore. To accommodate dies of still different sizes, one or more extra inner parts 39 may be provided containing end bores of the desired diameters. Instead of forming the adapter 33 in two parts, it may of course be made in but a single part, with end bores of different sizes in the ends thereof, extra single-piece adapters of course being provided to accommodate dies of other diameters.

The bracing post 35 is adapted to be inserted in an aperture 43 provided in the rear portion of the bed plate 19 a substantial distance behind the socket 20, the post having a lower end portion 44 of reduced diameter which fits snugly within this otherwise unoccupied aperture in the bed plate. The post 35 also has an upper end portion 45 of reduced diameter for engagement with the rear end of the back-thrust bar 36.

After the adapter 33 with the die 34 has been inserted in the socket 20 and the post 35 has been inserted in the aperture 43, the bar 36 is placed in a horizontal position between the upper ends of the die 34 and post 35. The bar 36 has a small aperture 46 in its rear end which fits snugly over the reduced upper end 45 of the post, and has a small recess 47 in its front end, either in the form of an aperture or notch, which bears against the rear surface of the upper end of the die 34, the close fitting engagement of the rear end of the bar with the upper end of the post serving to hold the bar in a horizontal position. A die 48, of proper shape for coaction with the die 34, is then selected and inserted in the reciprocable die

holder 16, after which the special bending attachment is ready for use.

With this improved attachment it will be obvious that small circles and other ordinarily difficult forms can be formed up with ease. The relatively small cross section of the spindle-like die 34 makes it possible to bend a piece of rule (indicated at 49 in dotted lines) into small closely arranged turns at any place throughout the length of the piece, the post 35 and bar 36 keeping the die 34 from being bent back under the extremely high pressure to which the latter is subjected, and the elevation of the bar 36 above the surface of the bed plate 19 permitting any portion of the piece of rule to be turned back around the die 34 into any part of the open space behind the die during the bending of other portions of the piece. The location of the special die 34 at the place ordinarily occupied by the regular stationary die holder 21 leaves the usual working space in front of the stationary die unobstructed and also permits of a full stroke of the reciprocable die holder 16 under the toggle action of the hand lever 11 and link 13.

In applying the back-thrust bar 36 to the die 34, it will of course be understood that a bar will be selected having a front recess 47 which will just fit the particular die selected, a set of graduated recess bars on the order of those shown in Fig. 12 being provided for that purpose.

While it is quite advantageous to have the die 34 made as a separate part, irrespective of whether or not the adapter 33 be made in two parts or in only one part, it will of course be appreciated that the die and adapter may be made as a single unit, particularly in the larger sizes of dies.

When small squares or other shapes containing closely arranged sharp corners are to be bent, an adapter 50 and angular die 51 (see Fig. 11) can be used instead of the adapter 33 and curved die 34, the adapter 50 and die 51 being made either in two parts or else combined together as a single unit.

In the modification shown in Figs. 13 and 14 the back-thrust bar 52 is curved downwardly at 53 and merged into a cylindrical post-like section 54. The section 54 fits snugly within a hole 55, at about the same location as the hole 43 in the first described embodiment of the invention, and is held against movement in the hole by a thumb-screw 56 in the rear edge of the bed plate 57. The front end of the bar 52 has an open notch 58 in one side thereof for engagement with the upper end 59 of the die 60. In bringing the bar 52 into bracing engagement with the upper end of the die, the front end of the bar can be swung laterally into position and then held against return movement by a tightening of the thumb-screw 56. Instead of the bar 52 being swung laterally into position, it may be moved straight downwardly, the front end of the bar being fitted with the upper end of the die while the anchoring section 54 of the bar is being bottomed in the hole 55.

When bending a piece of rule, the same may be placed against one end of an adjustably positioned gauge rod 61. This rod is carried by the upper part 62 of a two-part clamp 63, being adjustably held in a bore 64 in the upper part 62 by a thumbscrew 65. The upper part 62 of the clamp is provided with a downwardly projecting cylindrical stud 66 which is rotatably seated in a socket 67 in the lower part 68 and is held in any desired position of adjustment

with respect to the lower part by a thumbscrew 69. The lower part 68 of the clamp is in turn carried by an L-shaped rod 70, one leg 71 of the rod 70 being adjustably positioned in a bore 72 in the lower part 68 by a thumbscrew 73, and the other leg 74 of the rod 70 being adjustably positioned in a bore 75 in one side of the bed plate 19 by a thumbscrew 76. A similar bore 75, having associated therewith a similar thumbscrew 76, is located at the opposite side of the bed plate 19, whereby to permit the gauge to be mounted at either side of the press.

I claim:

1. A special metal strip bending attachment for application to a hand press of the type having a base, a stationary die holder removably mounted in a socket in the base, a reciprocable die holder slidably mounted on the base in front of the stationary die holder for moving a die carried by the same into operative association with a complementary die carried by the stationary die holder, and a hand lever for imparting movement to the reciprocable die holder; said special attachment consisting of an adapter for insertion in the socket in the base in place of the aforesaid stationary die holder, an upwardly projecting die of relatively small cross section on the adapter for complementary coaction with a die carried by the reciprocable die holder, an upwardly projecting post on the base a substantial distance behind the adapter, and a back-thrust bar removably positioned above the base between the upper end of the post and the upper end of the die on the adapter, said bar being positioned a substantial distance above the base to permit the metal strip being bent to be fed back around the die on the adapter under the bar, and said bar terminating at its front end adjacent the upper end of the die on the adapter to afford an unobstructed working space above the path of travel of the die carried by the reciprocable die holder.

2. A special metal strip bending attachment for application to a hand press of the type having a base, a stationary die holder removably mounted in a socket in the base, a reciprocable die holder slidably mounted on the base in front of the stationary die holder for moving a die carried by the same into operative association with a complementary die carried by the stationary die

holder, and a hand lever for imparting movement to the reciprocable die holder; said special attachment consisting of an adapter for insertion in the socket in the base in place of the aforesaid stationary die holder, an upwardly projecting die of relatively small cross section on the adapter for complementary coaction with a die carried by the reciprocable die holder, and means for supporting the upper end of said upwardly projecting die, comprising a removable brace which extends rearwardly from the upper end of the die in vertically spaced relation to the base and is anchored at its rear end to the base, said brace being positioned a substantial distance above the base to permit the metal strip being bent to be fed back around the die on the adapter under the brace, and said brace terminating at its front end adjacent the upper end of the die on the adapter to afford an unobstructed working space above the path of travel of the die carried by the reciprocable die holder.

3. A special bending attachment for application to a hand press of the type having a base, a stationary die holder removably mounted in a socket in the base, a reciprocable die holder slidably mounted on the base in front of the stationary die holder for moving a die carried by the same into operative association with a complementary die carried by the stationary die holder, and a hand lever for imparting movement to the reciprocable die holder; said special attachment consisting of a two-part adapter for insertion in the socket in the base in place of the aforesaid stationary die holder, said socket being of rectangular cross section, and said adapter consisting of an outer centrally bored part of the same rectangular cross section as the socket and an inner part of the same diameter as the bore in the outer part, an upwardly projecting die of relatively small cross section on the upper end of the inner part of the adapter for complementary coaction with a die carried by the reciprocable die holder, an upwardly projecting post on the base a substantial distance behind the adapter, and a back-thrust bar removably positioned above the base between the upper end of the post and the upper end of the die on the adapter.

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