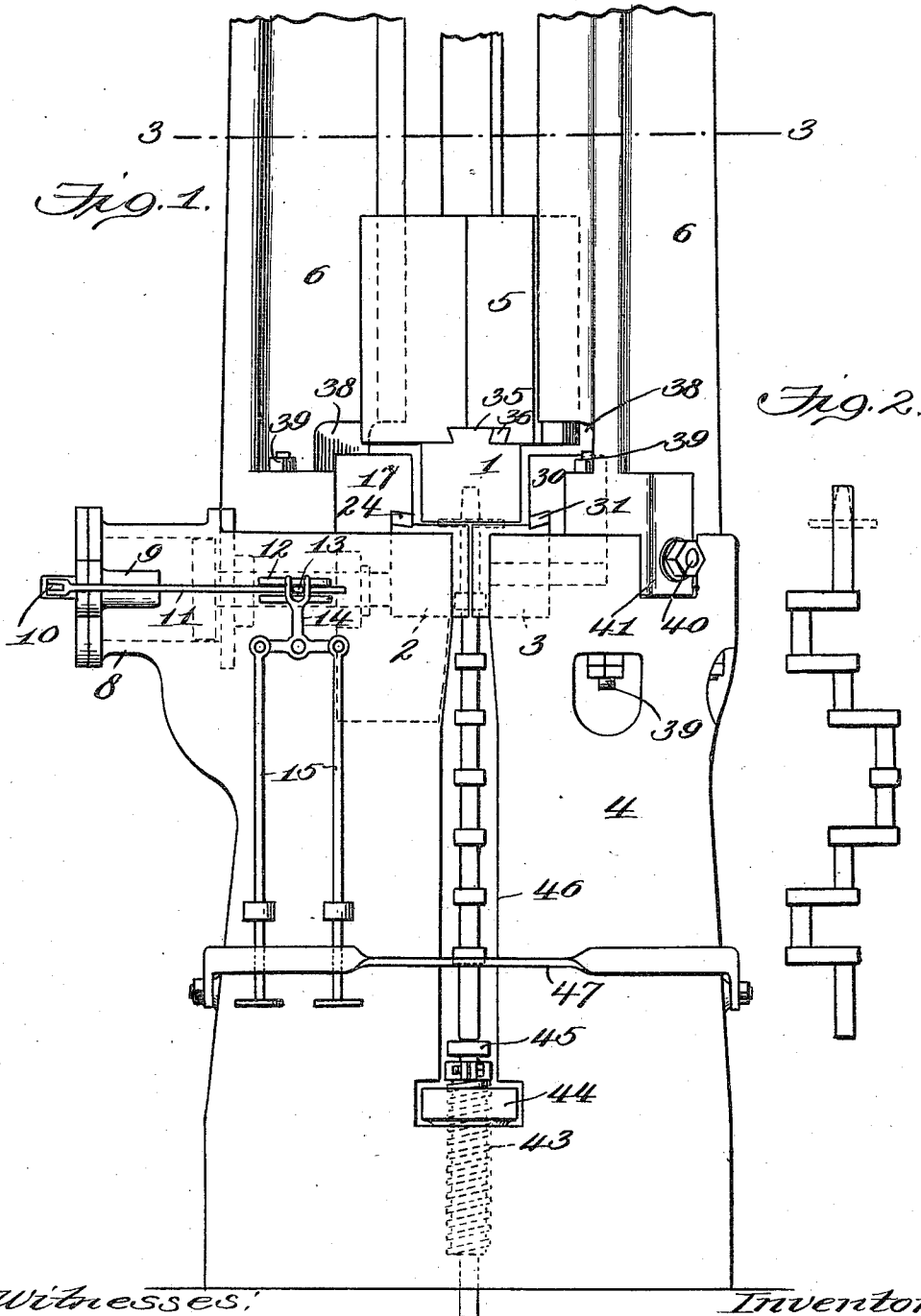


J. JOHNSON.
UPSETTING PRESS.
APPLICATION FILED MAY 4, 1910.

986,295.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 1.



Witnesses:
Charles A. Kessler
W. B. Kessler

Inventor
Justus Johnson
Amos L. Norris

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2 SHEETS-SHEET 2.

Fig. 3.

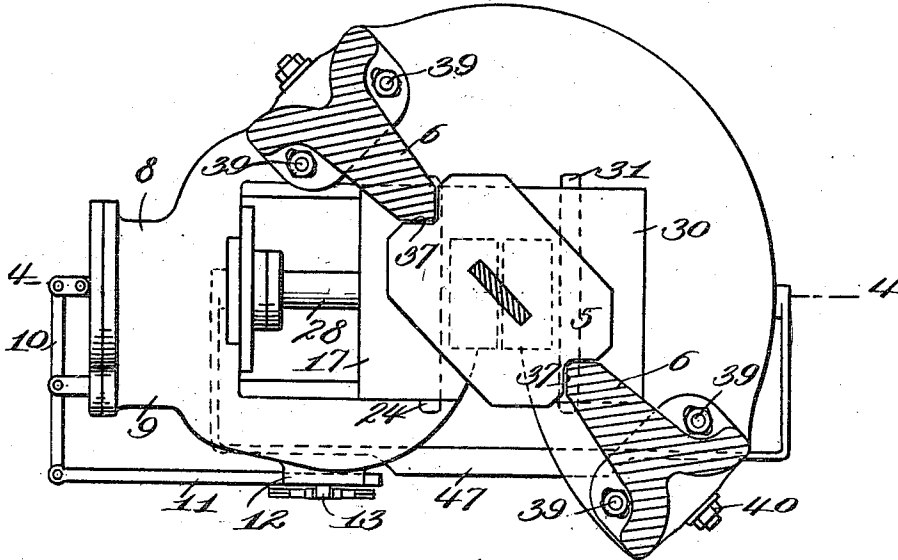


Fig. 4.

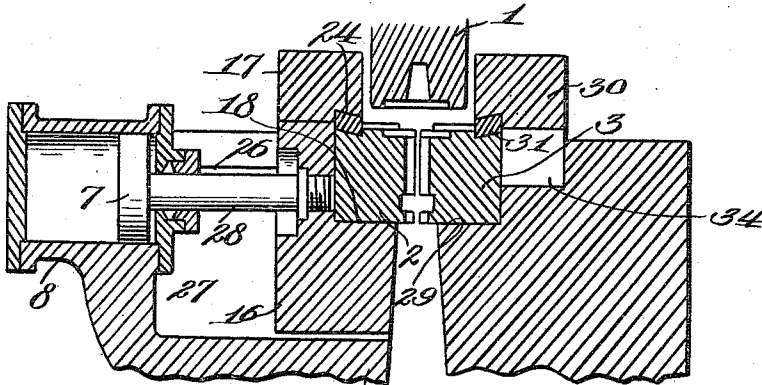


Fig. 5.

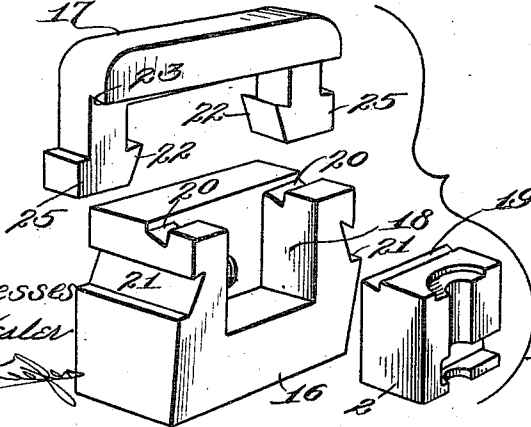
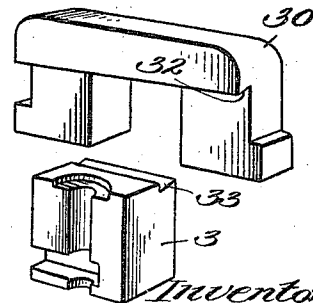


Fig. 6.



Witnesses
E. K. Kaler
[Signature]

Inventor
Justus Johnson
[Signature]

UNITED STATES PATENT OFFICE.

JUSTUS JOHNSON, OF SOUTH BETHLEHEM, PENNSYLVANIA.

UPSETTING-PRESS.

986,295.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed May 4, 1910. Serial No. 559,349.

To all whom it may concern:

Be it known that I, JUSTUS JOHNSON, a citizen of the United States, residing at South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented new and useful Improvements in Upsetting-Presses, of which the following is a specification.

This invention relates to improvements in upsetting presses. The upsetting press commonly used is a horizontal machine, working mechanically and slow moving. On account of its slow, retarded movement, the forging must be heated well, and in many cases where highly fusible alloy steel is used and in connection with which great care must be exercised to prevent too high a degree of heating, the forging will be burned. A limitation is thus put upon the usefulness of the horizontal press and it is therefore not capable of producing all the operations which may be required in connection with a forging of material length.

The present invention proposes a vertical upsetting press of novel construction and by the use of which a swift blow is imparted to the end of the forging, this operation being quicker and more efficient than that of the horizontal press.

An embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a machine in accordance with the present invention; Fig. 2 is an elevation of a crank shaft forging shown merely to exemplify the operation of the machine; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a detail fragmentary section on the line 4—4 of Fig. 3; Fig. 5 is a detail perspective view showing in disassembled relation a movable die, its holder, and a clamp for maintaining a fixed association of the die and the holder; and Fig. 6 is a similar view of a stationary die and its holder.

Similar characters of reference designate corresponding parts throughout the several views.

The essential operating parts are an upsetting die, as 1, a movable clamping die, as 2, and a stationary die, as 3. The dies 2 and 3 are associated with a suitably supported base, as 4, in a manner to be specifically set forth, and the die 1 is associated with a hammer, as 5, which travels with re-

lation to upright guides, as 6, secured upon the base 4.

The dies 2 and 3 are of course arranged in confronting relation, and the die 2 is movable toward and away from the die 3. An advantageous, though not obligatory means for effecting the movement of the die 2, consists of a piston, as 7, working in a cylinder 8, and moved, both operatively and retractionally, by hydraulic pressure. The admission of the operating fluid to either end of the cylinder 8 is controlled by a valve of any approved form and shown conventionally at 9. The movements of the valve 9 may be effected in any suitable manner. As shown, the stem of the valve is connected to an arm, as 10, which at one end is pivoted to a head of the cylinder 8 and at its other end is pivoted to a link, as 11. The latter works in a suitable guide 12 and is provided with a pin, as 13, which engages in a fork at the end of the central arm of a T lever, as 14. The other arms of said lever are connected to treadle rods, as 15.

The upper face of the base 4 is of course suitably recessed to receive the dies 2 and 3, and their associated parts. The die 2 is fitted in a holder, as 16, and is held in fixed association therewith by a clamp, as 17. The construction of these parts is shown in detail in Fig. 5. The holder 16 is provided with a recess 18 opening to its front and upper faces and into which the die 2 fits. The latter has at its rear edge and in its upper face a transverse recess or groove 19, alining with grooves 20 formed in the upper face of the holder 16. The latter has in its side faces substantially dovetail horizontal grooves, as 21. The clamp 17 is of inverted U shape and has its lower end portions formed with inward lateral projections, as 22, which conformably engage in the grooves 21. The upper portion of the clamp 17 has an under cut face 23, which overlies the grooves 19 and 20 and forms therewith a keyway to receive a key 24 which is employed to maintain the association of the die 2 and the holder 16. The clamp 17 has its lower end portions also formed with outward lateral projections, as 25, which engage in grooves, as 26, formed longitudinally in the side faces of the recess 27 of the base 4 in which the holder 16 is fitted and has movement. The piston 7 has a rod, as 28, which projects through a stuffing

box at the inner end of the cylinder 8 and is joined to the die holder 16, thus constituting a direct connection between said piston and said die holder.

5 The stationary clamping die 3 is fitted in a recess, as 29, in the upper face of the base 4 and is connected to a clamp, as 30, by means of a key, as 31, which fits in a keyway afforded between an under-cut face 32 of
10 said clamp and a recess, as 33, formed at the rear edge of the upper face of the die 3. The clamp 30 is generally similar to the clamp 17 and is fitted in a recess, as 34, formed in the upper face of the base 4,
15 rearwardly of the recess 29.

The upsetting die 1 is provided on its upper face with a dovetail tang, as 35, which fits in a similarly shaped recess in the under face of the hammer 5 and is held therein
20 by a key, as 36.

In order to provide for compendiousness as well as for ready accessibility to the dies, the hammer 5 is diagonally disposed with reference to the axis of movement of the
25 movable die and the guides 6 are arranged adjacent the ends of the hammer. Said guides are of a T-shaped cross section, their central flanges projecting into vertical grooves, as 37, formed in the end faces of
30 the hammer, and, at their lower ends being cut away as at 38 in order that the removal and replacement of the dies may be readily effected. Bolt fastenings, as 39, are employed to secure the uprights upon the base,
35 the openings through which the bolts extend being of a length to provide for lateral adjustments of the guides with relation to the hammer. These adjustments are effected by bolts or screws, as 40, which extend through
40 depending extensions, as 41, of the guides and are threaded into the base, the extensions 41 fitting in recesses in the base so as to be substantially flush with the surface thereof.

At the lower end of the base there is provided an adjustable device for supporting the lower end of the forging. This device may be of any approved character. As shown, it comprises a hollow screw post, as
45 43, threaded through an adjusting nut, as 44, and carrying a head, as 45, against which the lower end of the forging rests. The base 4 is provided with a vertical slot, as 46, into which the head 45 projects, and which extends to the upper face of said base,
50 opening under the die 1, and between the dies 2 and 3.

The mechanism by which the movements of the hammer 5 are controlled, is not shown and may be of any approved form ordinarily used in drop forging, and controlled
60 by a treadle. Such a treadle is shown conventionally at 47.

By way of example, the operation disclosed is that of forming flanges or collars
65 by upsetting the ends of forgings whether

long or short. A crank-shaft forging is shown in Fig. 2 and is positioned in the slot 46 in the manner shown in Fig. 1, its lower end resting upon the head 45 and its upper end portion being disposed coaxially with
70 the die 1 and between the dies 2 and 3. The working faces of the dies are of course shaped with regard to the character of forging in connection with which they are to be employed, and the form and proportions
75 of the collar or flange which is to be produced.

In operation, the dies having been selected with regard to the character of the forging and having been connected to the parts by
80 which they are carried, the head 45 is adjusted with regard to the length of the forging and the latter is positioned vertically in the slot 46, its upper end portion being conformably fitted in the recessed face of the
85 die 2. Thereupon, the die 2 is caused to move toward the die 3 and to cooperate with the latter in firmly clamping the forging and maintaining the perpendicular position thereof. The hammer is now operated to
90 cause the die 1 to strike the upper end of the forging with a swift heavy blow thereby displacing the metal and producing the conformation desired.

No specific description herein contained is
95 intended to put any limitation on the claims not inherent in the language thereof.

Having fully described my invention, I claim:

1. An upsetting press comprising a base
100 having a recessed upper face, a stationary clamping die fitted in the recessed face, a stationary clamping die removably associated with the clamp, a movable clamping die opposed to the stationary die, a holder for the movable
105 die and also fitted in the recessed face, clamp means for maintaining the association of the movable die and its holder, means connected to the holder of the movable die for holding the latter in close and constant association
110 with the stationary die throughout the upsetting operation, a work support for holding the forging in a perpendicular position between the dies, an upsetting die for cooperation with the clamping dies in producing
115 the conformation desired, and a drop hammer carrying the upsetting die and with which the latter is removably associated.

2. An upsetting press comprising a base, a stationary clamping die associated with the
120 base, a second clamping die movable in a horizontal direction toward and away from the stationary clamping die and cooperating with the latter, the clamping dies being removably associated with the base, an upsetting
125 die for cooperation with the clamping dies in producing the conformation desired, a drop hammer carrying the upsetting die, upright guides for the drop hammer, the guides being located opposite to one another
130

and diagonally with respect to the axis of movement of the movable clamping die, and means for holding the movable clamping die in close and constant association with the stationary clamping die throughout the upsetting operation.

3. An upsetting press comprising a base having a recessed upper face, a stationary clamping die fitted in the recessed face, a clamp which fixes the stationary die in the recessed face of the base and with which the stationary die is removably associated, a movable clamping die opposed to the stationary die, a holder fitted in the recessed face and with which the movable die is removably associated, means connected to the holder of the movable die for holding the latter in close and constant association with the stationary die throughout the upsetting operation, an upsetting die for coöperation with the clamping dies in producing the conformation desired, a drop hammer carrying the upsetting die, and upright T-shaped guides for the drop hammer, the guides being located opposite to one another and diagonally with respect to the axis of movement of the movable clamping die and having the lower portions of their central flanges cut away.

4. In an upsetting press, the combination with a base, of a movable die associated therewith, a holder in which the movable die is fitted, a U-shaped clamp connected to the holder and slidably associated with the base, and a key which binds together the holder, the clamp and the movable die.

5. An upsetting press comprising a base formed with a vertical slot extending to its upper end, and at its upper end with recesses at each side of the slot, a stationary clamping die fitted in one of the recesses, clamp means for holding the stationary die, a movable clamping die opposed to and co-operating with the stationary die, a holder in which the movable die is fitted, the holder being in turn fitted in the other recess, means for clamping together the holder and the movable die, operating means for the mov-

able die, an upsetting die coöperating with the clamping dies, a drop hammer carrying the upsetting die, and a work support arranged at the lower end of the slot upon which the lower end of the forging rests, and which coöperates with the clamping dies in holding the forging in a perpendicular position.

6. In an upsetting press, a base having a recessed upper face, a die fitted in the recess of the face, a U-shaped clamp also fitted in the recess of the face, and a key for interlockingly connecting the die and the clamp.

7. In an upsetting press, a base having a recessed upper face, a die holder slidably mounted in the recess of the base and in turn having a recessed face, a die fitted in the recess of the holder, a U-shaped clamp removably fitted upon the holder, and a key for interlockingly connecting the die and the clamp.

8. An upsetting press comprising a base, a stationary clamping die removably associated with the base, a second clamping die also removably associated with the base and movable in a horizontal direction toward and away from the stationary clamping die and coöperating with the latter, the two clamping dies having coincident axes, an upsetting die for coöperation with the clamping dies for producing the conformation desired, a drop hammer carrying the upsetting die, and a pair of upright guides for determining the movement of the drop hammer, the guides being located opposite to one another and diagonally with respect to the said coincident axes and the drop hammer being also located diagonally with respect to the said coincident axes and having in its end faces longitudinal grooves to receive the edge portions of the guides.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JUSTUS JOHNSON.

Witnesses:

GEO. L. BROSSMAN,
I. T. HARTZOG.