T. E. HOLMES.

FORGING PRESS.

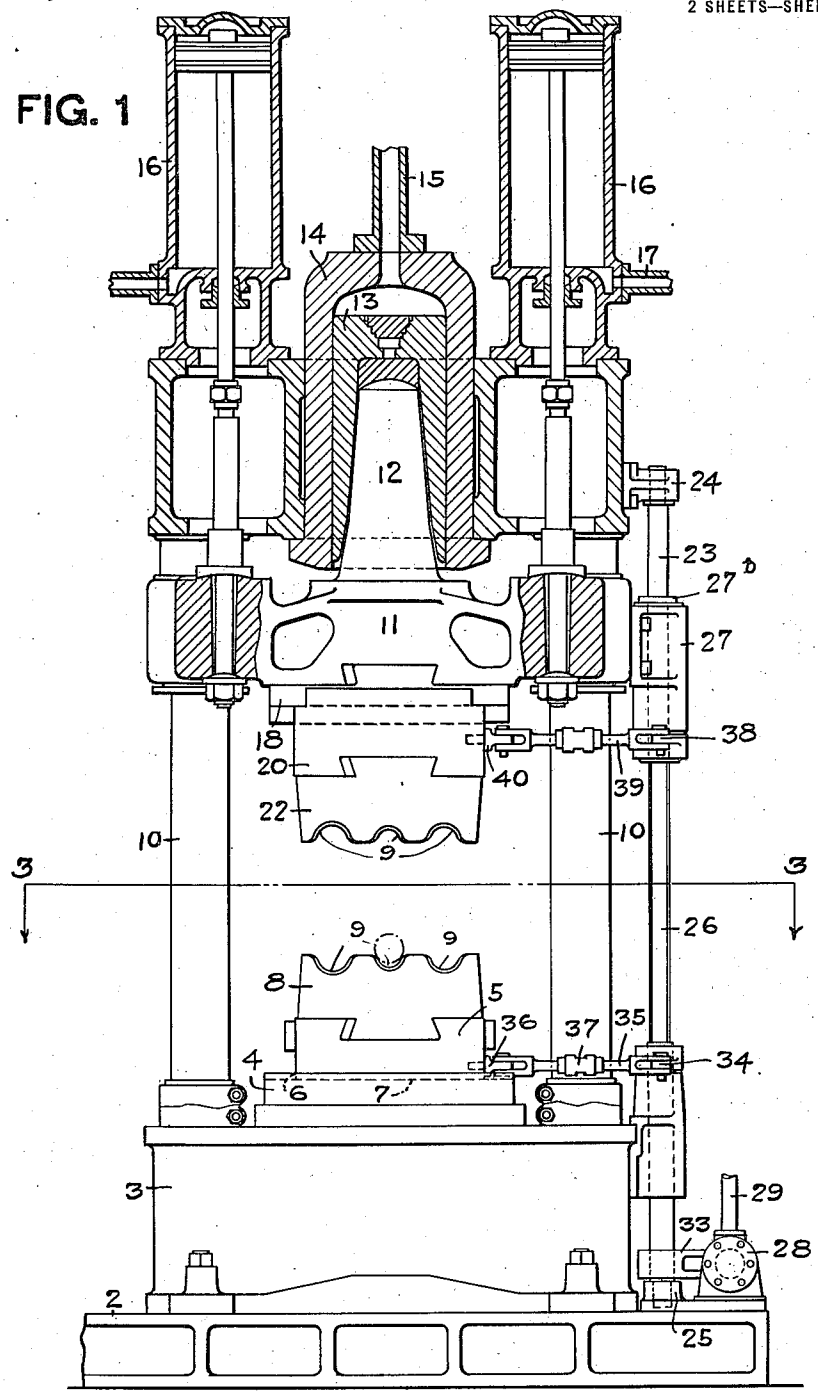
APPLICATION FILED AUG. 10, 1914.

1,275,258.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

FIG. 1



WITNESSES.

J. R. Keller

John F. Hill

INVENTOR.

Thomas Edmund Holmes

By Kay Totten Powell

Atty

T. E. HOLMES.

FORGING PRESS.

APPLICATION FILED AUG. 10, 1914.

1,275,258.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 2.

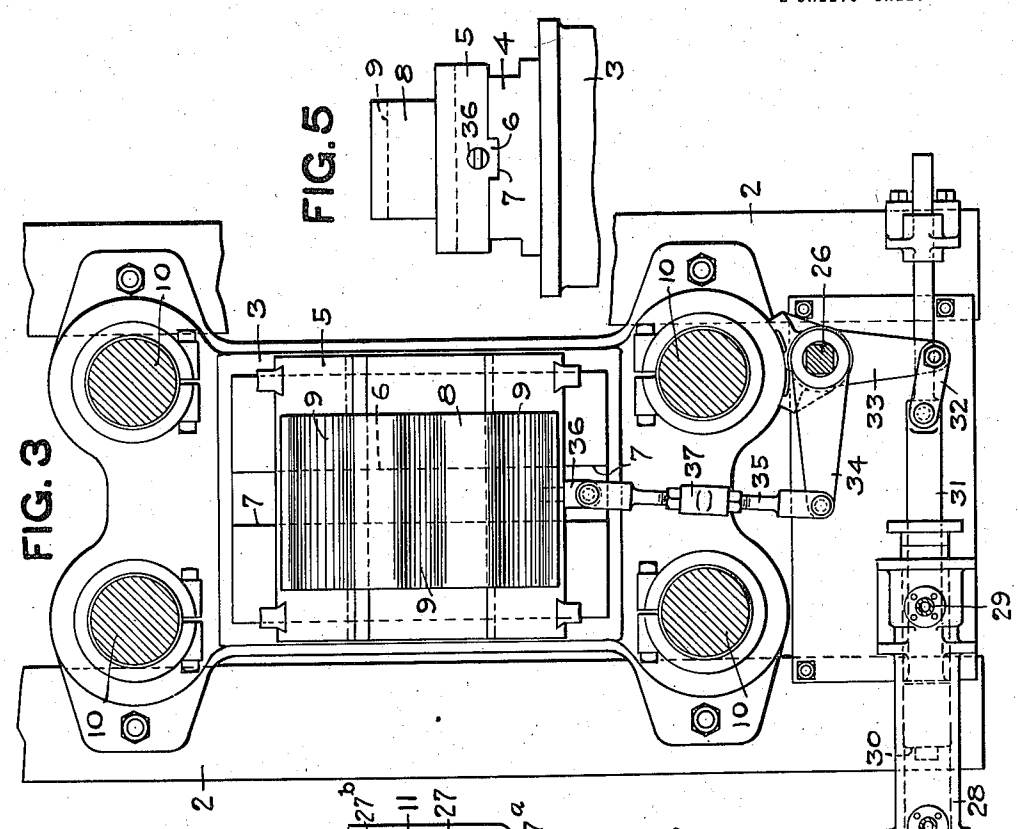


FIG. 3

FIG. 5

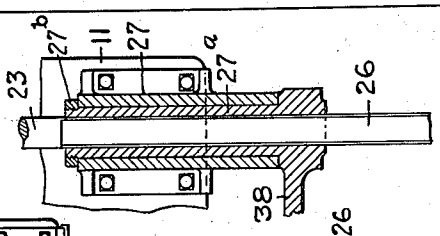


FIG. 6

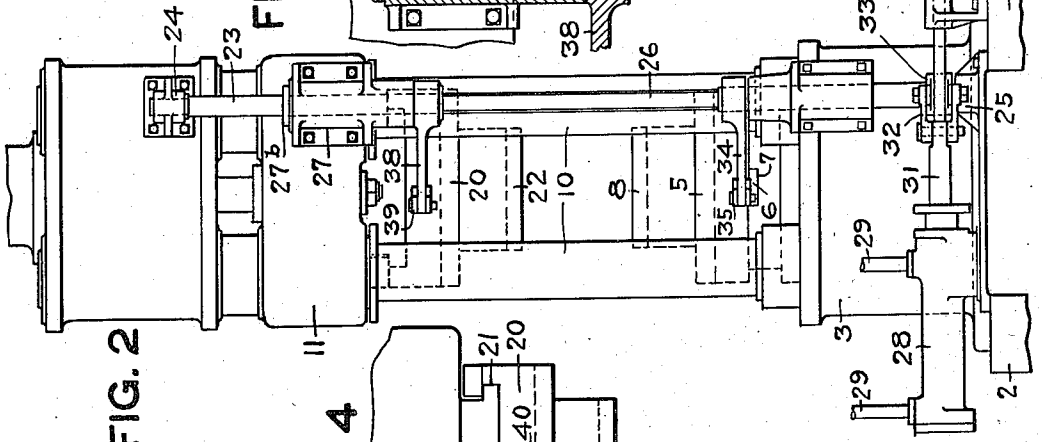


FIG. 2

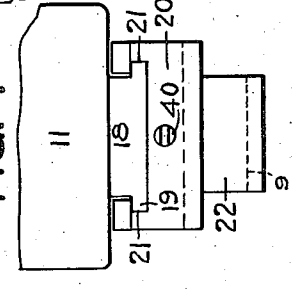


FIG. 4

WITNESSES.

J. R. Keller

John F. Hill

INVENTOR.

Thomas Edmund Holmes

By Kay Totten Powell

Atty's

UNITED STATES PATENT OFFICE.

THOMAS EDMUND HOLMES, OF NETHER EDGE, SHEFFIELD, ENGLAND, ASSIGNOR TO UNITED ENGINEERING & FOUNDRY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FORGING-PRESS.

1,275,258. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed August 10, 1914. Serial No. 856,050.

To all whom it may concern:

Be it known that I, THOMAS EDMUND HOLMES, a subject of the King of England, and resident of Nether Edge, Sheffield, England, have invented a new and useful Improvemeent in Forging-Presses; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to forging-presses, forging hammers and machines of like character where a forging or hammering operation between dies is employed to reduce a mass of steel to the desired shape or contour.

In machines of this character it is often necessary to employ dies having a plurality of working grooves, the material being transferred from one to the other in bringing it to its proper shape, such for instance as in the forging of an axle. Heretofore the dies have been arranged stationary in the upper and lower die-blocks, and when the axle was being operated on by one of the grooves to the right or left of the center groove, the strain on the machine was very great, due to the pressing operation taking place at one side of the axial line of the ram or plunger to which the upper die is attached. Being off center the machine is not properly balanced, and a leverage occurred which put a strain on the guides for the press head as well as on the cross-head and die blocks.

The object of my present invention is to provide for the forging operations in the axial line of the ram or plunger of the press, and this I accomplish by arranging for the movement of the dies horizontally, so that the grooves in which the articles to be worked on are to be inclosed may be brought directly in to the axial line of the ram or plunger.

In the accompanying drawings, Figure 1 is the vertical elevation of a forging press showing my invention applied thereto, the upper portion being shown in section; Fig. 2 is a side view; Fig. 3 is a section on the line 3—3; Fig. 1 and Figs. 4 and 5 are details of the upper and lower die and holder. Fig. 6 is an enlarged sectional view of the sliding sleeve attached to the cross-head.

I have illustrated my invention in connection with a forging-press of what is known as the Davy type operating on the steam intensifier system in which the pressing stroke is obtained by displacing a column of water, although the invention is applicable to other forms of forging-presses, hammers, or the like. The numeral 2 designates the girder or foundation to which is bolted or otherwise secured the base 3, which supports the guide-block 4. The anvil block 5 has the tongue portion 6, which engages the groove 7 formed in the guide-block 4, and the anvil-block 5 is adapted to slide back and forth in said groove, for the purpose fully hereinafter set forth. The anvil 8 is secured to the anvil block 5 by the ordinary dove-tail connection. The working face of the anvil is provided with the grooves 9 which are shaped to give in connection with the grooves of the upper die, the desired contour to the article to be forged.

The pillars 10 are carried by the base 3, and said pillars form the guides for the cross-head 11. The cross-head 11 has the projection 12 which engages the ram 13 working in the cylinder 14. The pipe 15 connects up the cylinder 14 with the water-system of a steam intensifier of the Davy type, as above referred to. It has not been deemed necessary, however, to go into the details of such construction, as it forms no part of the present invention.

Ordinarily, lifting cylinders 16 with steam connections 17 are provided for lifting the cross head 11.

The guide-block 18 is secured to the cross-head by an ordinary dove-tail connection, and said guide-block has the T-guide 19 with which the die-block 20 is adapted to engage by means of the groove 21, as clearly indicated in Fig. 4.

The upper die 22 is secured to the die block 20 by the ordinary dove-tail connection.

Having now described how the lower anvil-block and the upper die-block are mounted so as to be capable of movement in the guide-blocks 4 and 18, respectively, I will now describe the mechanism for moving said guide-blocks.

The vertical rod 23 is mounted in bearings 24 and 25. The portion of said rod 23 intermediate the bearings 24 and 25 is square in cross-section as at 26, and a sleeve portion 27 connected to the cross-head 11 engages said rod, said sleeve portion being adapted to slide up and down thereon.

To provide, however, for the rotation of the rod 23 within said sleeve, for the purpose more fully hereinafter set forth, the bushing 27ª is inserted in said sleeve and held in place by the nut 27ᵇ. The square portion 26 of the rod 23 engages the bore of the bushing 27ª so that said bushing rotates in said sleeve when said rod is rotated.

Mounted on the girder 2 is the cylinder 28, with steam connections 29 on opposite sides of the piston 30. The piston rod 31 is connected up by link 32 to the crank-arm 33, said crank arm being mounted on the square portion of the rod 23, so that any movement of the crank-arm 33 will act to rotate the rod 23 in its bearings. A crank-arm 34 is likewise secured to the square portion of the rod 23, and an arm 35 is pivoted to said crank-arm 34 at one end, and at its opposite end to the projection 36 on the anvil block 5. The rod 35 is provided with the turn-buckle 37 for purposes of adjustment.

A crank-arm is likewise secured to the square portion of the rod 23, and an arm is pivoted to said crank-arm 34 at one end, and at its opposite end to the projection 36 on the anvil block 5. The rod 35 is provided with the turn-buckle 37 for purposes of adjustment.

A crank-arm 38 is connected to the bushing 27ª on the rod 23 and pivotally connected to the rod 39, said rod being pivoted at its inner end to the projection 40 on the upper die-block 20.

When forging an axle in my improved machine, the axle-blank is laid upon the lower anvil-block resting in one of the grooves 9, and if the central groove is being employed, the parts remain in the position indicated in Fig. 1, and the upper die is lowered and the forging operation takes place, the line of pressure on the article being formed on the axial line of the ram of the press-head. When, however, it is desired to bring one of the grooves to one side or the other of the central groove into play, the operator by a suitable valve controlling the supply of motive fluid to the cylinder 28 directs the motive fluid into one end or the other of said cylinder so as to move the piston, and the movement of said piston through the connections described will act to rotate the rod 23, and the rotation of said rod will act through the connections described to simultaneously move the anvil-block 5 and the die-block 20 into position to bring the grooves in which the next operation is to take place over into position, so that the center of said combined grooves will be on the axial line of the ram of the press. In this manner, the forging operation always takes place with the article to be forged in the direct line of the ram, and in this way, the strains on the machine due to working off the center are avoided, and the work is distributed evenly on the cross-head and on the pillars 10. Furthermore, the strain on the bolts securing the machine to the base-plate is relieved and loosening and racking of the frame prevented.

What I claim is:

In a forging-press, or like machine, the combination of a stationary die movable at right angles to the movement of the press, a reciprocatory cross-head, a die supported by said cross-head and movable at right angles to the line of movement of said press, said dies having registering work forming depressions therein, a rotatable rod, a motor, connections between said motor and said rod, connections between said rod and the stationary die, a sleeve member on said cross-head engaging said rod and slidable thereon, a bushing in said sleeve rotatable with said rod, and connections between said bushing and said die on said cross-head.

In testimony whereof I, the said THOMAS EDMUND HOLMES, have hereunto set my hand.

THOMAS EDMUND HOLMES.

Witnesses:
LUTHER J. FARR,
RICE K. EVANS.