

No. 776,845.

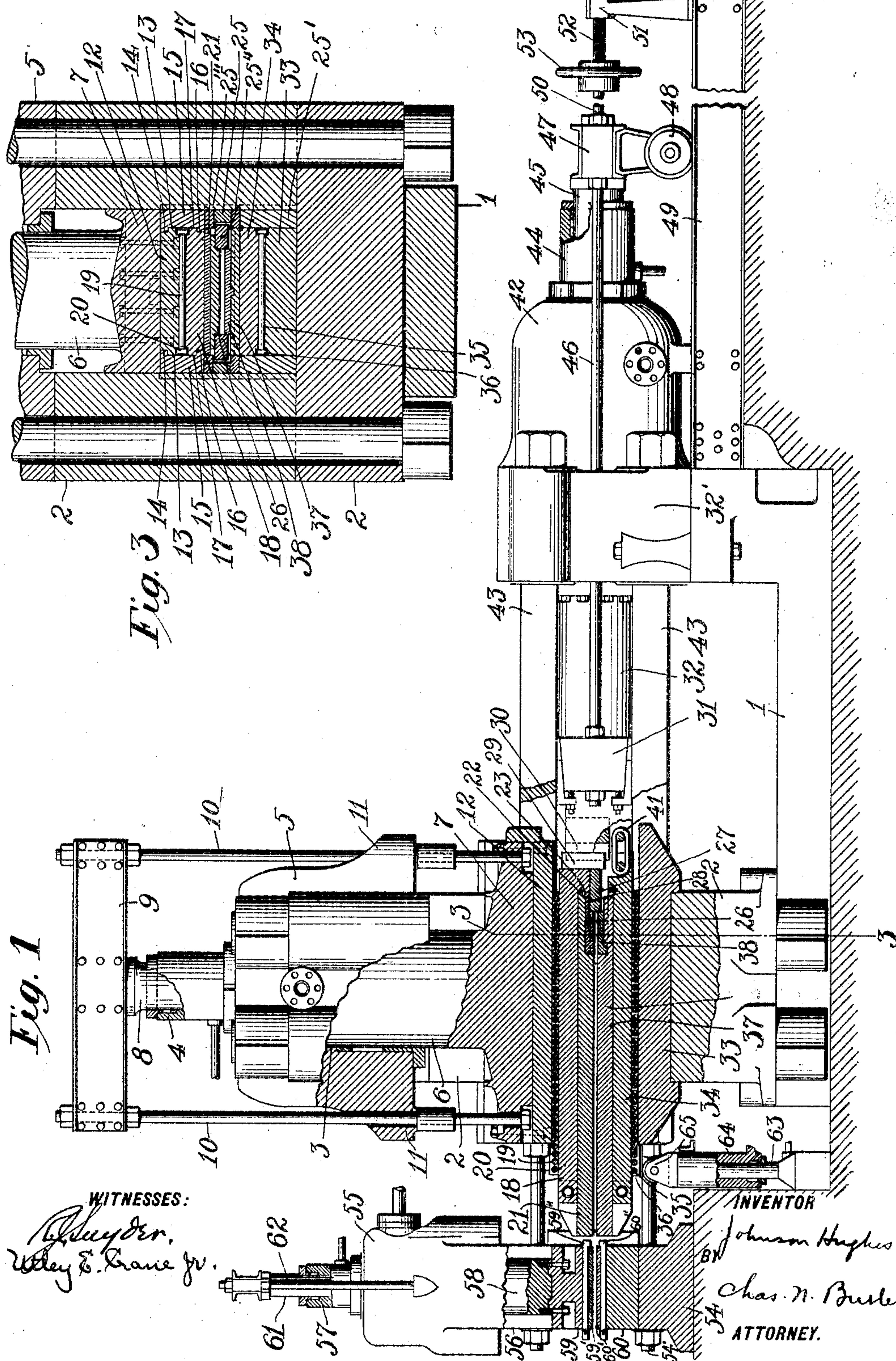
PATENTED DEC. 6, 1904.

J. HUGHES.
BAR HEAD FORGING MECHANISM.

APPLICATION FILED, FEB. 9, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2

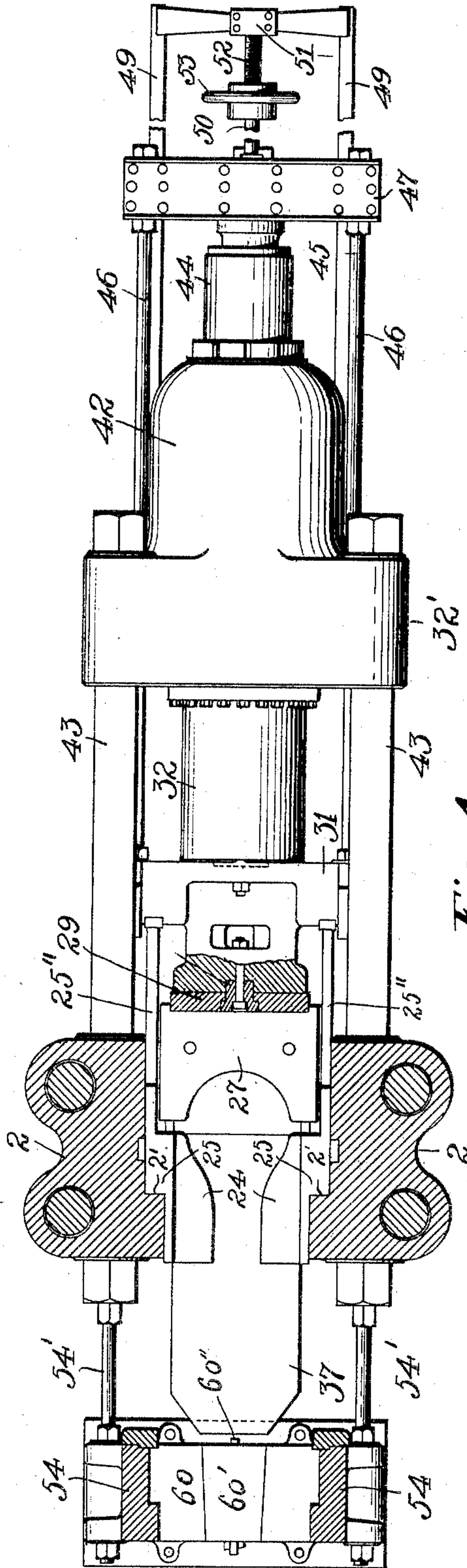


Fig. 4

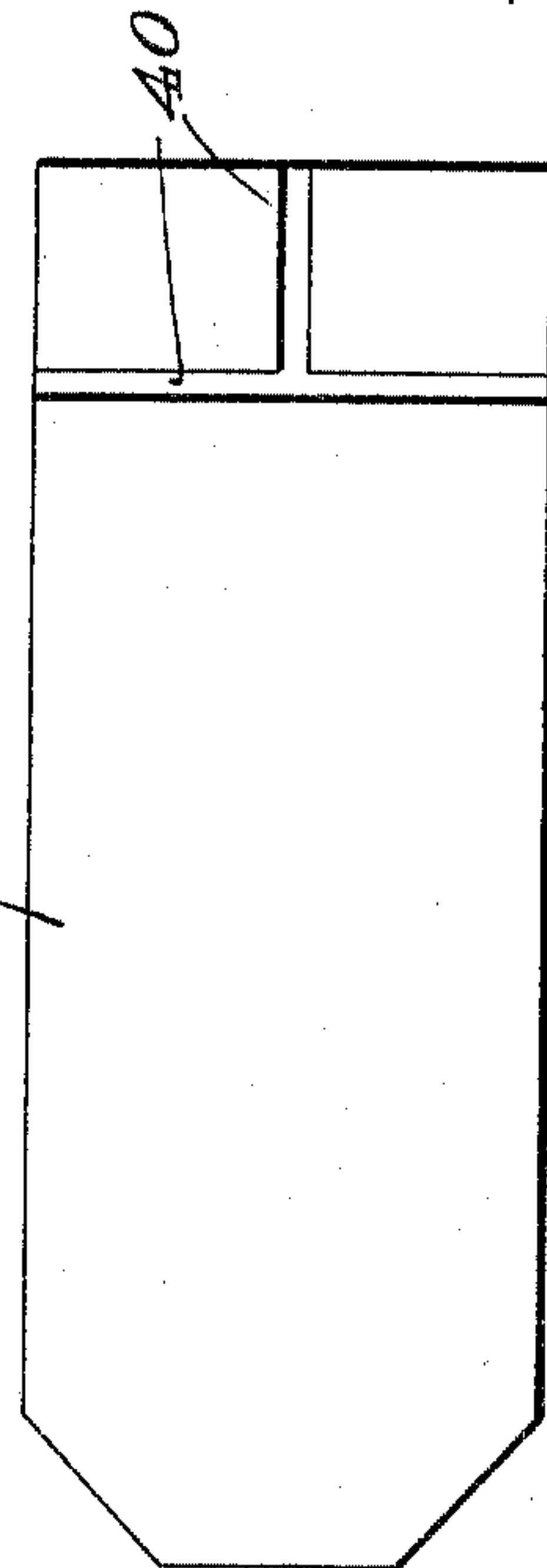
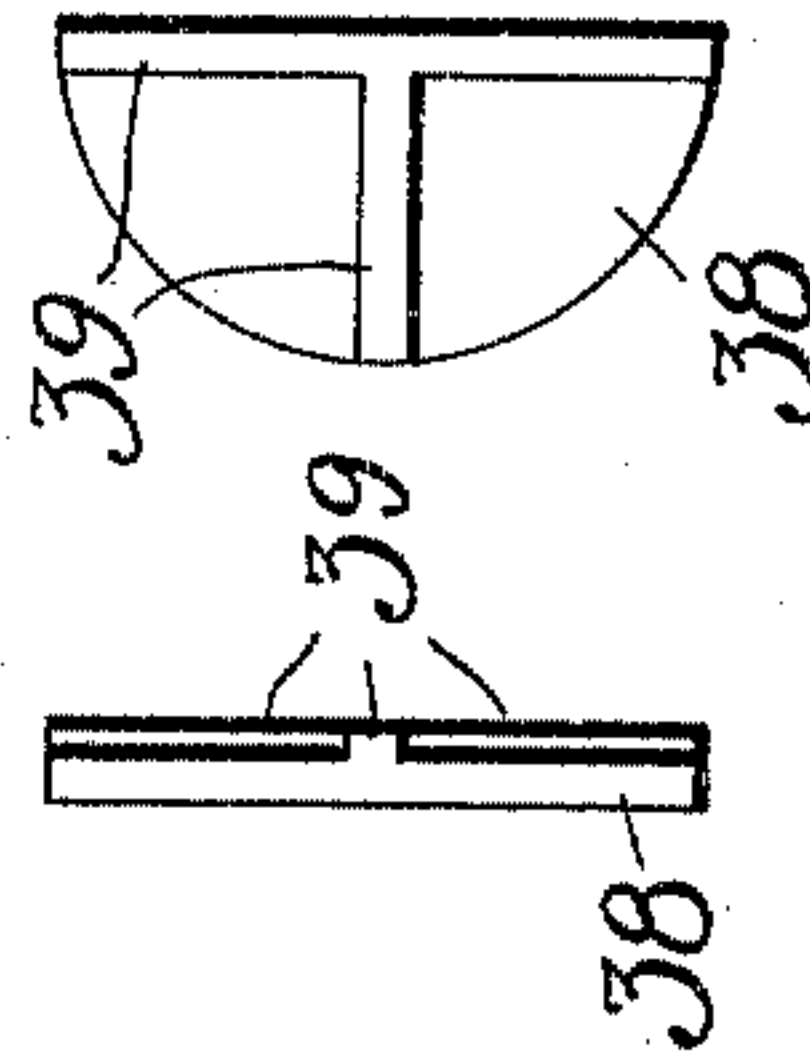


Fig. 5 Fig. 6



WITNESSES:

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BAR-HEAD-FORGING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 776,845, dated December 6, 1904.

Application filed February 9, 1904. Serial No. 192,731. (No model.)

To all whom it may concern:

Be it known that I, JOHNSON HUGHES, a citizen of the United States, residing at Wissahickon, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Bar-Head-Forging Mechanism, of which the following is a specification.

This invention is designed particularly for forging I-bar heads, providing improved mechanism therefor, comprising a gripping mechanism for holding the bars, a reciprocating die mechanism for forging the heads, a ram of variable stroke for reciprocating the die mechanism, mechanism for opening and closing the dies, and mechanism for separating the forged heads from the dies.

In the accompanying drawings, Figure 1 represents a side elevation, partially in section, of a machine embodying my improvements. Fig. 2 represents a plan view of the same, partially in section. Fig. 3 represents a sectional view taken on the line 3-3 of Fig. 1. Fig. 4 represents a face view of a die-plate. Fig. 5 represents an end view of a cheek-piece adapted to register with the head of the die-plate, and Fig. 6 represents a bottom view of the cheek-piece.

As shown in the drawings, the base 1 supports the housings 2, having the cylinder 3 in the head 5 thereof and the smaller cylinder 4 projecting therefrom. A ram or plunger 8 works in the cylinder 4 to lift the ram-head, the lifting action being effected through the cross-head 9 and the rods 10, which reciprocate in the guides 11, and a ram or plunger 6 works in the cylinder 3 to depress the head. The head 7 has fixed thereto the bearing-slab 12, provided with flanges 13, by which the slab engages the flanges 14 of the guides 15, these guides having the further flanges 16, which engage the flanges 17 of a slab 18. Between the slabs 12 and 18 are the rollers 19, journaled in the floating connecting-bars 20 to provide for the free longitudinal movement of the slab 18.

The slab 18 acts as the bed for a die-plate 21, the plate having the reduced end 22, which engages a seat 23 of the slab. Adjacent to this plate are the neck-pieces 24, having the bearing members or lining-pieces 25,

which engage the bearing members 2' of the housings 2, to which the neck-pieces are fixed.

The base of the housings 2 supports the stationary lining-pieces or bearings 25', upon which the bearing members 25 of the neck-pieces 24 rest, the lining-pieces 25' being readily removed and changed, as may be required, for adjusting the positions of the neck-pieces supported thereby. Resting on the lining members 25' are the stationary lining-pieces or bearings 25'', which abut against the bearings 25 and are held in place by the stationary lining-pieces or bearings 25''', the latter limiting the downward movement of the guides 15 and the vertically-movable parts connected therewith.

The reduced end 22 of the die-plate 21 has the cheek-piece or wearing-plate 26 seated therein. The cheek-piece is reduced at its forward end, so as to have a semicircular front and seat the header 27, which is fixed to the slab 18, the reduced part 28 of the cheek-piece being engaged by the header, which thus holds the cheek-piece in place at the head of the die-plate.

At the head of the slab 18 is fixed a guide 29, which interlocks with a block 30, fixed to the head 31 of the ram 32, the interlocking parts permitting the head 7 to move vertically the slab 18 and the die-pieces fixed thereto without disconnecting them from the horizontally-reciprocating ram 32.

The housing carries a bed-plate 33, which supports a slab 34, the slab resting on the rollers 35, journaled in the floating bars 36. A die-plate 37 is fixed to the slab 34 and has its forward end reduced to receive the semicircular wearing-plate or cheek-piece 38, the cheek-piece being provided with the ribs 39, which engage the grooves 40 of the die-plate, and, like the cheek-piece 26, having an outline curve conforming to that of the header which receives it.

The slab 34 is engaged to the ram-head 31 by the link 41, forming a flexible connection by which the ram draws back the slab 34 and the die mechanism connected therewith simultaneously with the slab 18 and the die mechanism connected therewith.

The ram 32 reciprocates in a cylinder 42,

supported by the housings 32', secured to the base 1, these housings being connected to the housings 2 by the guide-bars 43, in which the head 31 reciprocates. The cylinder 42 is used to advance the ram, while to retract it there is fixed at its rear a smaller cylinder 44, having a plunger or smaller ram 45 acting therein and having its head 47 connected with the head 31 by the rods 46. The end of the plunger 45 is supported on the truck 48, which runs on the rails 49. The plunger reciprocates relatively to the rod 50, extending therein and fixed to the bearing 51, the rod having the screw-threaded section 52, upon which the stop 53 is movable to the position desired to regulate the backward movement of the ram and vary its stroke.

The gripping device in line with the die mechanism comprises the housings 54, having in the head 55 the large cylinder 56, from which extends the small cylinder 57, the housings 54 being connected to the housings 2 by the tie-rods 54'. Working in the cylinder 56 is the ram 58, having the head 59, which coacts with the stationary bed 60 to grip the bar. The ram is elevated to release the bar by the cylinder 57 and its plunger 61, which is connected with the ram by the rods 62.

The bed 60 has seated therein a removable wedge-shaped wearing-plate 60'. The plate is firmly wedged in the seat in the bed, to which it is fitted, and is held in place by the bolt 60'', which is passed through the bed, the head of the bolt engaging the head of the wedge to prevent it from being drawn back. In like manner the ram-head 59 has seated therein a wearing-plate 59', held in place by the head of a bolt 59'', passing through the head, the plate 59' and the bolt 59'' being duplicates of the plate 60' and the bolt 60''.

Between the housings 2 and 54 is a supporting and striking device comprising a stationary piston 63 and a cylinder 64, movable thereon, the cylinder having a roller-head 65, adapted for supporting the bar in inserting and withdrawing it and for striking the bar and knocking it loose from the die mechanism when the latter is released.

It will now be understood that the rearward movement of the heading-ram 32 is regulated by regulating the position of the stop 53, and its forward movement is limited by the stationary members 25', against which its head 31 abuts. As the slabs 18 and 34, with the die mechanism fixed thereto, are engaged to the ram-head 31, their longitudinal reciprocations are regulated thereby. The die mechanism being retracted by the ram 32, the slab 18, with the die parts fixed thereto, being elevated, the cylinder 64 being elevated, and the gripper being open, the bar on which the head is to be forged is passed between the gripping-plates 59' and 60' over the roller-head 65 to the proper distance between the retracted die-plates 21 and 37. Then the grip-

ping-ram 58 is lowered to engage the bar, the cylinder 64 is lowered to permit the forward movement of the die mechanism, the ram 6 is lowered to lower the slab 18, with the die-plate 21, cheek-piece 26, and header 27, until the guides 15 rest on the liners or bearings supported by the base of the housing 2, which properly spaces the die mechanism for forming a head of the desired thickness. The ram 32 is now advanced and upsets the end of the bar and forms a head thereon conforming to the closed die mechanism. The ram 6 is then elevated to separate the parts of the die mechanism. The gripper is released, the ram 32 is drawn back, and the die mechanism retracted. The cylinder 64 is elevated to strike the bar, if required, to disengage it from the die mechanism and to act as a support in withdrawing it.

It will be understood that the several changeable parts, as the neck-pieces, cheek-pieces, header, and gripping-plates, which are subject to the greatest wear, can be made of superior material and readily replaced at comparatively small expense, avoiding the expense and inconvenience attending operations in which such wearing parts are integral as distinguished from separable parts of the grippers and die mechanisms, and as the wedge-shaped wearing-plates of the grippers have their heads placed to receive the thrust exerted by the upsetting-ram they cannot be unseated by the thrust, but can readily be removed when this is required.

Having described my invention, I claim—

1. In a forging-machine, a horizontally-movable die mechanism, a vertically-reciprocating ram to which said die mechanism is connected, a horizontally-reciprocating ram, and a vertically-movable connection engaging said horizontally-reciprocating ram to said die mechanism, substantially as specified.

2. In a forging-machine, a vertically-reciprocating ram, a die mechanism connected thereto and reciprocated thereby, means for permitting said die mechanism to reciprocate horizontally, a horizontally-reciprocating ram, a transversely-sliding connection between said horizontally-reciprocating ram and die mechanism, a second horizontally-reciprocating die mechanism coacting with said first die mechanism, and means for connecting said second die mechanism to said horizontally-reciprocating ram, substantially as specified.

3. In a forging-machine, a vertically-reciprocating ram, a pair of horizontal guides connected thereto, a die mechanism comprising a die-plate, a cheek-piece and a header fixed together, and means whereby said die mechanism reciprocates horizontally in said guides, substantially as specified.

4. In a forging-machine, a horizontally-movable die mechanism, a horizontally-reciprocating ram connected to said die mechanism, guide-bars for supporting said ram, a smaller reciprocating ram connected to said first ram,

and a truck for carrying said smaller ram, substantially as specified.

5 In a forging-machine, a horizontally-movable die mechanism, a horizontally-reciprocating ram mechanism connected to said die mechanism, means for limiting the forward movement of said ram mechanism, a movable stop for regulating the rearward movement of said ram mechanism, and guide-bars and a truck
10 for supporting said ram mechanism, substantially as specified.

6. In a forging-machine, a horizontally-movable die mechanism, a horizontally-reciprocating ram mechanism connected to said die mechanism, in combination with a gripping mech-
15 anism having a bed, a vertically-reciprocating ram mechanism, and wedge-shaped wearing-plates seated in said bed and in the head of said ram mechanism, the heads of said wearing-plates being disposed toward said horizontally-reciprocating ram mechanism, substantially as specified.

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In testimony whereof I have hereunto set my hand, this 6th day of February, 1904, in the presence of the subscribing witnesses.

JOHNSON HUGHES.

In presence of—

JOHN THIEL,

UTLEY E. CRANE, Jr.