Sept. 7, 1943. E. G. EPPENS 2,328,969

FORGING HAMMER

Filed June 6, 1941

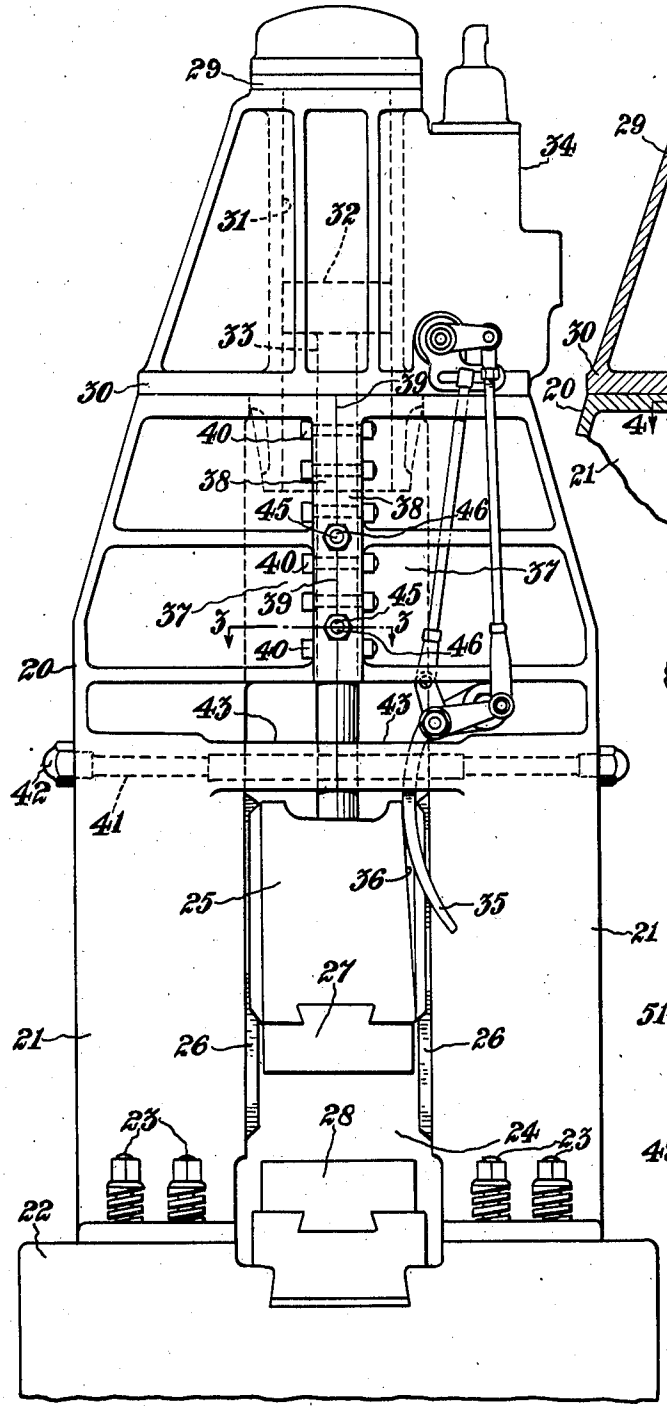

FIG.-1.

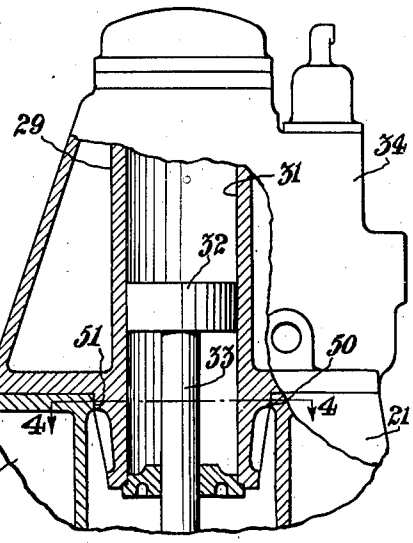

FIG.-2.

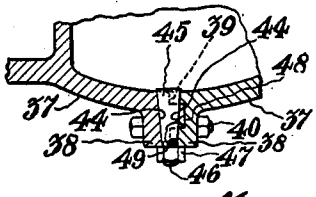

FIG.-3.

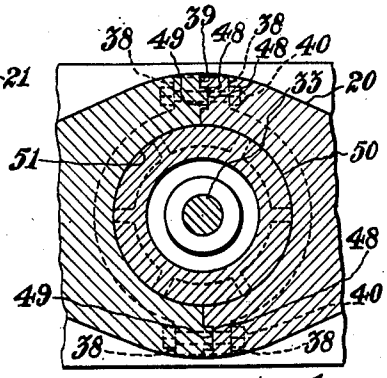

FIG.-4.

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FORGING HAMMER

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Application June 6, 1941, Serial No. 396,823

3 Claims. (Cl. 78—13)

This invention relates to forging hammers, and more particularly to forging hammers of the vertical type.

One object of the invention is to assure a rigid structure capable of fully withstanding the shocks and jars to which it is subjected during a forging operation.

Another object is to preclude relative movement of the parts constituting the frame of the forging hammer.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is a front elevation of a forging hammer constructed in accordance with the practice of the invention,

Figure 2 is an tlevation, partly broken away, of the power element of the forging hammer,

Figure 3 is a transverse view taken through Figure 1 on the line 3—3, and

Figure 4 is a view similar to Figure 3 taken on the line 4—4 in Figure 2.

Referring more particularly to the drawing, the forging hammer, designated in general by 20, comprises a pair of columns 21 that rest upon a base member 22 and are secured thereto by bolts 23.

The columns 21 are suitably spaced with respect to each other and form the sides of a guideway 24 for reciprocatory hammer 25. The sides of the hammer 25 slidably engage guide members 26 on the columns and carries a die 27 that cooperates with a stationary die 28 on the base member 22 for forging the work.

On the upper ends of the columns 21 is a cylinder 29 having a flange 30 intermediate its ends that seats upon the columns and may be secured thereto in any suitable manner. The cylinder is bored to provide a piston chamber 31 for the accommodation of a reciprocatory piston 32 that carries a depending rod 33 attached at its lower end to the hammer 25.

The pressure fluid supply for actuating the piston 32 is distributed to the ends of the piston chamber 31 by suitable valve mechanism, only the valve chest 34 of which is shown, and motion is transmitted to such valve mechanism from the hammer 25 by a well known train of elements including an arcuate finger 35. The finger, as is customary, engages a cam surface 36 on the ram and is rocked back and forth by the cam surfaces 36 for actuating the valve mechanism.

In accordance with the practice of the invention, means are provided to assure a high degree of rigidity of the frame elements necessary to prevent a weaving action thereof and a consequent misalignment and undue wear of the reciprocatory parts of the hammer and of the elements serving as guides for these elements. To this end the columns are provided with introverted walls 37 at their sides to overlie the guideway 24. The walls 37 are of substantial height and are provided at their innermost ends with flanges 38 having surfaces 39 that seat against each other and are drawn securely together by bolts 40 extending through the flanges 38. In order to further assure against the separation of the columns 21 by such forces as may be applied laterally thereto by the hammer 25 tie bolts 41 are extended through both columns 21 and have nuts 42 threaded on their ends to seat on the sides of the columns. Preferably, sleeve extensions 43 are formed on the columns to encase the portions of the bolt 41 spanning the guideway 24, and the opposed ends of the sleeve extensions 43 seat against each other to prevent springing of the columns when threading the nuts 42 into clamping position.

The bolts 41 are of ample strength to fully resist the side thrust of the hammer against the columns and are preferably located at some distance below the walls 37 to prevent the impositions of undue strains upon the bolts 40 in the flanges 38.

In order to preclude any relative vertical movement of the flanges 38, tapered recesses 44 are formed in the surfaces 39 to register with each other for the accommodation of a tapered pin 45 having a threaded end 46 for the accommodation of a nut 47 whereby the tapered pin may be drawn firmly into the recesses. If desired, a plurality of recesses 44 and pins 45 may be used at different elevations in the surfaces 39, in the manner more particularly illustrated in Figure 1. Means are also provided to prevent lateral movement of the flanges 38 with respect to each other. To this end one of the flanges is provided with a longitudinally extending rib 48 that seats into a groove 49 in the adjacent flange.

From the foregoing description it will be readily apparent that by interlocking the flanges 38 together the upper portions of the columns will be restrained against lateral movement and that they will, therefore, be prevented from assuming a position that would cause the reciprocatory elements of the hammer to be deflected from the normal path of movement.

In order, however, to still further assure against the possible misalignment of the reciprocatory elements of the hammer the cylinder is provided, on the portion lying below the flange 30, with an external cylindrical surface 50 that extends into a bore 51 in the upper ends of the columns 21. By thus placing the cylinder 29 in telescopic engagement with the upper portions of the columns 21 and by securing the upper portion of the columns rigidly together, in the manner hereinbefore described, the frame elements of the hammer will be securely held against relative movement and the chances of imposing binding strains upon the reciprocatory elements of the hammer will be entirely avoided.

I claim:

1. A forging hammer, comprising a pair of columns spaced to form a guideway, introverted walls on the columns above the guideway having vertical surfaces to engage each other, means for clamping said surfaces together, means for preventing relative vertical movement of the walls, portions on the walls interlockingly engaging each other to prevent relative lateral movement of the columns, a cylinder on the columns, cylindrical surfaces on the cylinder and the columns cooperating with each other for maintaining the cylinder in axial alignment with the guideway, a piston in the cylinder having a rod, and a hammer on the rod slidable in the guideway.

2. A forging hammer, comprising a pair of columns spaced to form a guideway, introverted walls on the sides of the columns having vertical surfaces to engage each other, ribs on the walls interlockingly engaging each other to prevent relative lateral movement of the columns, tapered pins in the walls to prevent relative endwise movement of the columns, bolts for clamping the walls together, a cylinder on the columns, cylindrical surfaces on the cylinder and the columns cooperating with each other for maintaining the cylinder in axial alignment with the guideway, a piston in the cylinder having a rod, and a hammer on the rod slidable in the guideway.

3. A forging hammer, comprising a pair of columns spaced to form a guideway, introverted walls on the sides of the columns having vertical surfaces to engage each other, ribs on the walls interlockingly engaging each other to prevent relative lateral movement of the columns, pins in the walls to prevent relative endwise movement of the columns, bolts for clamping the walls together, a cylinder on the columns having an external cylindrical surface, there being a cylindrical bore in the upper ends of the columns to receive the cylindrical surface, a piston in the cylinder having a rod, and a hammer on the rod slidable in the guideway.

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