

Oct. 25, 1927.

G. W. PROUTY

1,646,872

PRESS

Filed Sept. 17, 1924

2 Sheets-Sheet 1

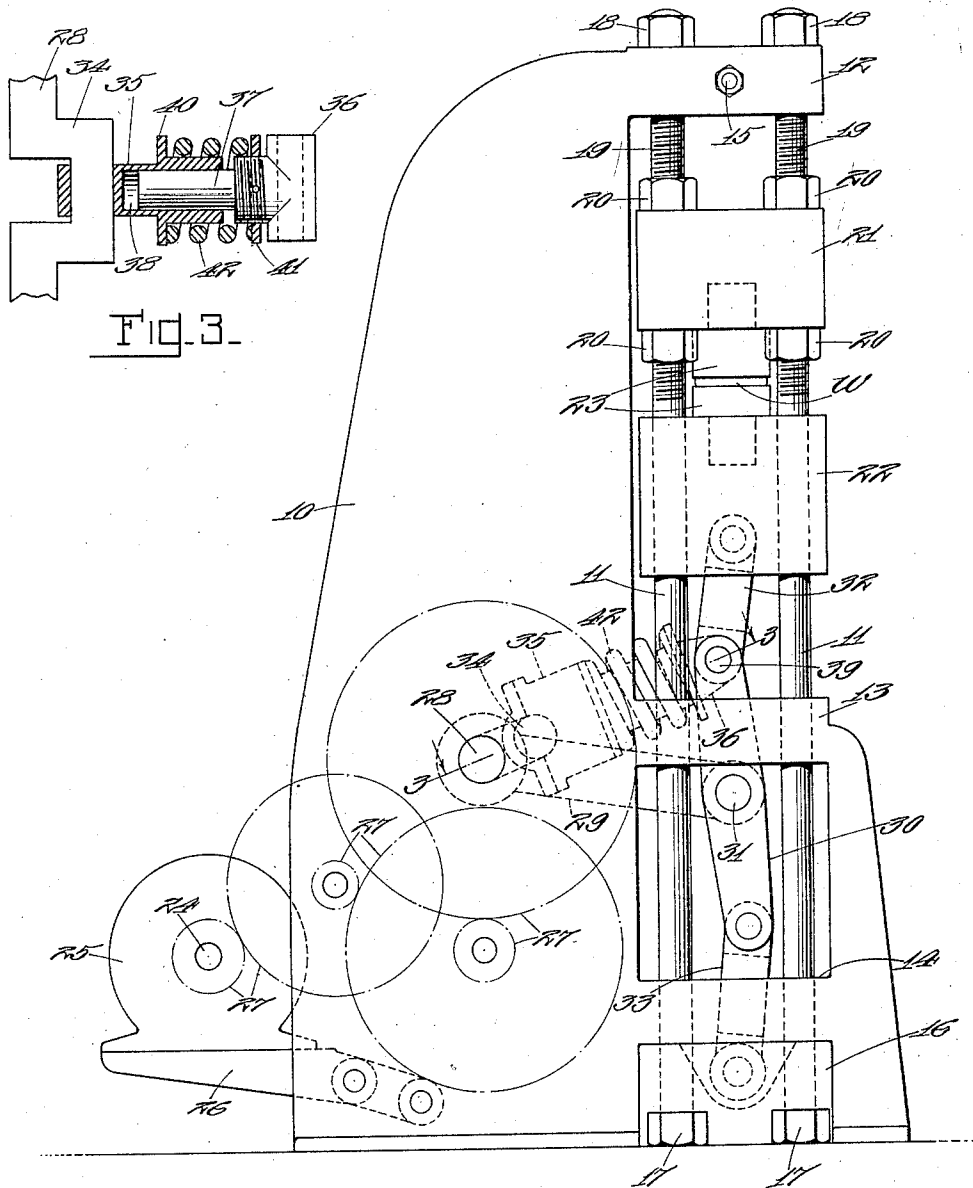


FIG. 1.

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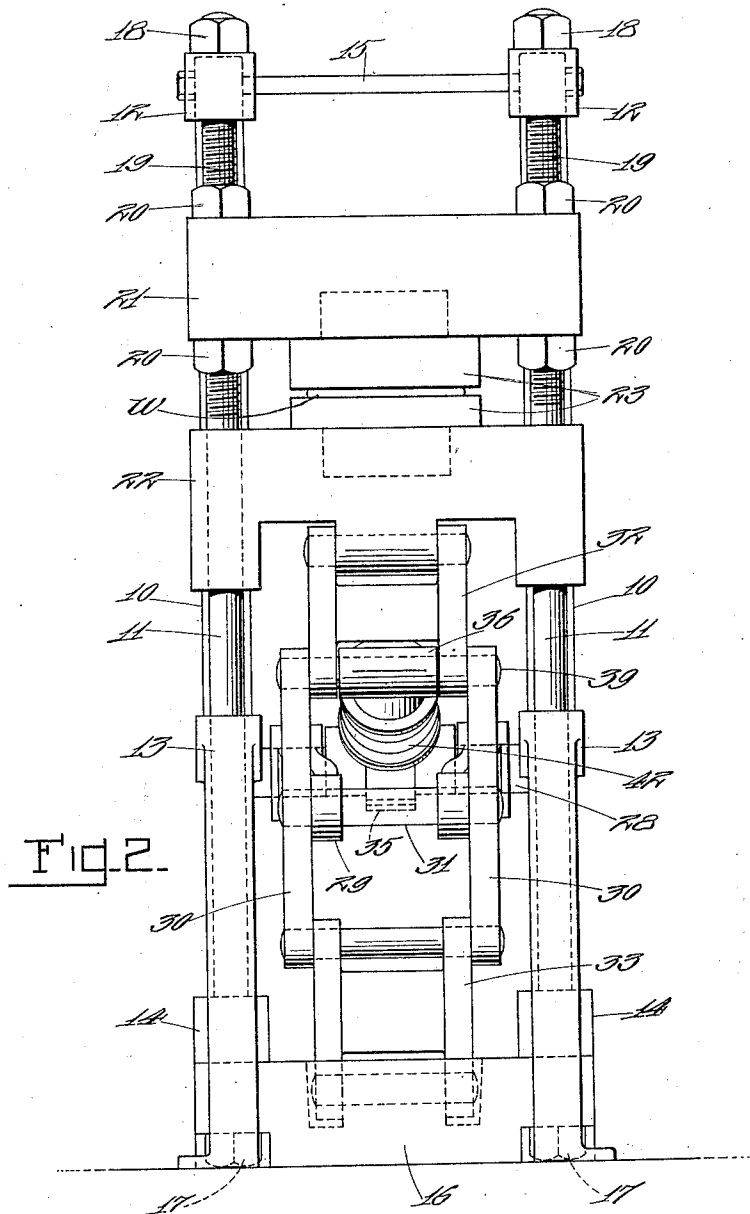
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UNITED STATES PATENT OFFICE.

GEORGE W. PROUTY, OF BOSTON, MASSACHUSETTS.

PRESS.

Application filed September 17, 1924. Serial No. 738,137.

This invention relates to mechanical presses and has for its general object to provide an improved press operating mechanism whereby the press is rendered capable of exerting a follow-up pressure upon the work, thereby adapting the press to operation upon substances, such, for example as a condensation product of phenol and formaldehyde and similar condensation products, which, when subjected to compression, have the property of contracting slowly into their compressed form, during which time the pressure thereon must be maintained.

In Letters Patent No. 1,382,386, issued to me June 21, 1921, is disclosed and claimed a press in which one of the press elements is moved toward the other by a compound toggle mechanism to exert a primary pressure, and wherein the other press element is thereafter moved by hydraulic means to exert a secondary or follow-up pressure. The present invention has for its more particular object to eliminate the hydraulic mechanism of presses of the type last referred to, and to provide means, wholly mechanical in its nature, whereby the secondary or follow-up pressure, as well as the primary pressure, may be obtained by movement of one of the press elements only.

The foregoing and other objects of the invention, together with means whereby the latter may be carried into effect, will best be understood from the following description of one form or embodiment thereof illustrated in the accompanying drawings. It will be understood, however, that the particular construction described and shown has been chosen for illustrative purposes merely, and that said invention, as defined by the claims hereunto appended, may be otherwise embodied without departure from the spirit and scope thereof.

In said drawings:

Fig. 1 is a side elevation and Fig. 2 a front elevation of a press embodying the invention.

Fig. 3 is a detail longitudinal section, taken substantially on line 3—3, Fig. 1, of the resilient or collapsible link or pitman for operating the toggle.

The frame of the press, as shown, comprises a pair of side uprights 10 in which are supported four vertical rods or posts 11. Said rods or posts pass through spaced horizontal portions 12, 13, and 14 of the side frames which are secured together at their

tops by a tie bolt 15 connecting the portions 12 and at their bottoms by a block 16 bolted to the portions 14 by the rods 11, said rods being formed at their lower ends with heads 17 engaging the block 16, and being threaded at their upper ends to receive nuts 18 engaging the frame portions 12. Adjacent their upper ends the rods or posts 11 are further threaded, as shown at 19, to receive nuts 20 by which is adjustably supported the bed 21 or stationary element of the press. The ram 22, or cooperating movable press element, is guided on the rods or posts 11 and is moved thereon toward and from the bed 21 by toggle mechanism hereinafter described. The cooperating press elements 21 and 22 carry complementary dies 23 for operating upon the interposed work W.

24 denotes a power shaft, herein shown as the armature shaft of an electric motor 25 carried by a suitable support 26 projecting rearwardly from the side uprights 10, the shaft 24 being connected by reducing gearing, generally indicated at 27, with a parallel countershaft 28 journaled in the side uprights 10 and constituting the prime mover of the press.

The compound toggle mechanism by which the ram 22 is operated from the shaft 28 is herein shown as of the general type disclosed and claimed in Letters Patent No. 1,404,406, issued to me January 24, 1922, but with certain important modifications and improvements adapting the same to use in a press of the character described for the purpose of accomplishing the results above referred to. Pivotally connected each at one end to the shaft 28 are two links 29 the opposite ends of which constitute a movable fulcrum for a pair of levers 30 pivoted intermediate their ends at 31 to said last named ends of the links 29. The opposite ends of the levers 30 are connected by links 32 and 33 respectively with the ram 22 and block 16, the latter forming a fixed abutment for the compound toggle mechanism.

In accordance with the present invention, the shaft 28 is provided with a crank 34 directly connected with the levers 30 by a resilient or collapsible link or pitman whose preferred construction is shown in detail in Fig. 3. Said pitman comprises two telescoping members 35 and 36, the latter having a reduced cylindrical portion 37 which is received and guided in a co-axial cylindrical chamber 38 in the former, the member 35

being pivotally connected with the crank 34 and the member 36 being pivotally connected with the levers 30, preferably through the pivot pin 39 which connects said levers with the links 32. The members 35 and 36 are formed with opposed shoulders 40 and 41, respectively, between which is interposed a strong spiral compression spring 42 surrounding the intervening portions of said members and resiliently resisting relative telescopic movement thereof in the direction to collapse the link or pitman.

In operation, the shaft 28 is slowly rotated toward the position shown in Fig. 1, thereby causing the pitman to straighten the compound toggle by moving the points of connection between the levers 30 and links 32 and 33 toward a position of alignment with the points of connection of said links with the ram 22 and abutment 16. The ram 22 is thereby moved toward the bed 21, and as the dies 23 close upon the work W, thereby arresting the movement of said ram, the spring 42 yields to permit the continued movement of the crank 34 into the position shown in Fig. 1 to be taken up by the collapse of the pitman. As the work W contracts, however, the tension of the spring 42 is exerted through the toggle mechanism and ram upon the work to apply the desired follow-up pressure thereto.

Having thus described my invention, I claim:

1. In a press, in combination, a movable press element, a toggle for operating the same, a prime mover, and connections between said prime mover and toggle for operating the latter, one of said parts including

a resilient element for exerting a follow-up pressure upon said movable press element.

2. In a press, in combination, a ram, a toggle for operating the same, a shaft, and connections between said shaft and toggle for straightening the latter, one of said parts including a resilient element for exerting a follow-up pressure upon said ram.

3. In a press, in combination, a ram, a toggle for operating the same, a shaft provided with means for operating said toggle and a resilient connection between said operating means and toggle.

4. In a press, in combination, a ram, a toggle for operating the same, a shaft provided with means for operating said toggle, a collapsible link connecting said operating means and toggle, and a spring for resiliently resisting collapse of said link.

5. In a press, in combination, a ram, a shaft having a crank thereon, a lever, a movable fulcrum upon which said lever is pivoted intermediate its ends, a fixed abutment, links connecting the opposite ends of said lever with said ram and abutment respectively, and a resilient pitman directly connecting said crank and lever.

6. In a press, in combination, a ram, a toggle for operating the same, a shaft having a crank thereon, and a collapsible pitman connecting said crank and toggle, said pitman comprising two longitudinally telescoping shouldered members pivotally connected to said crank and toggle respectively and a spring surrounding said members and interposed between the shoulders thereof.

In testimony whereof I affix my signature.
GEORGE W. PROUTY.