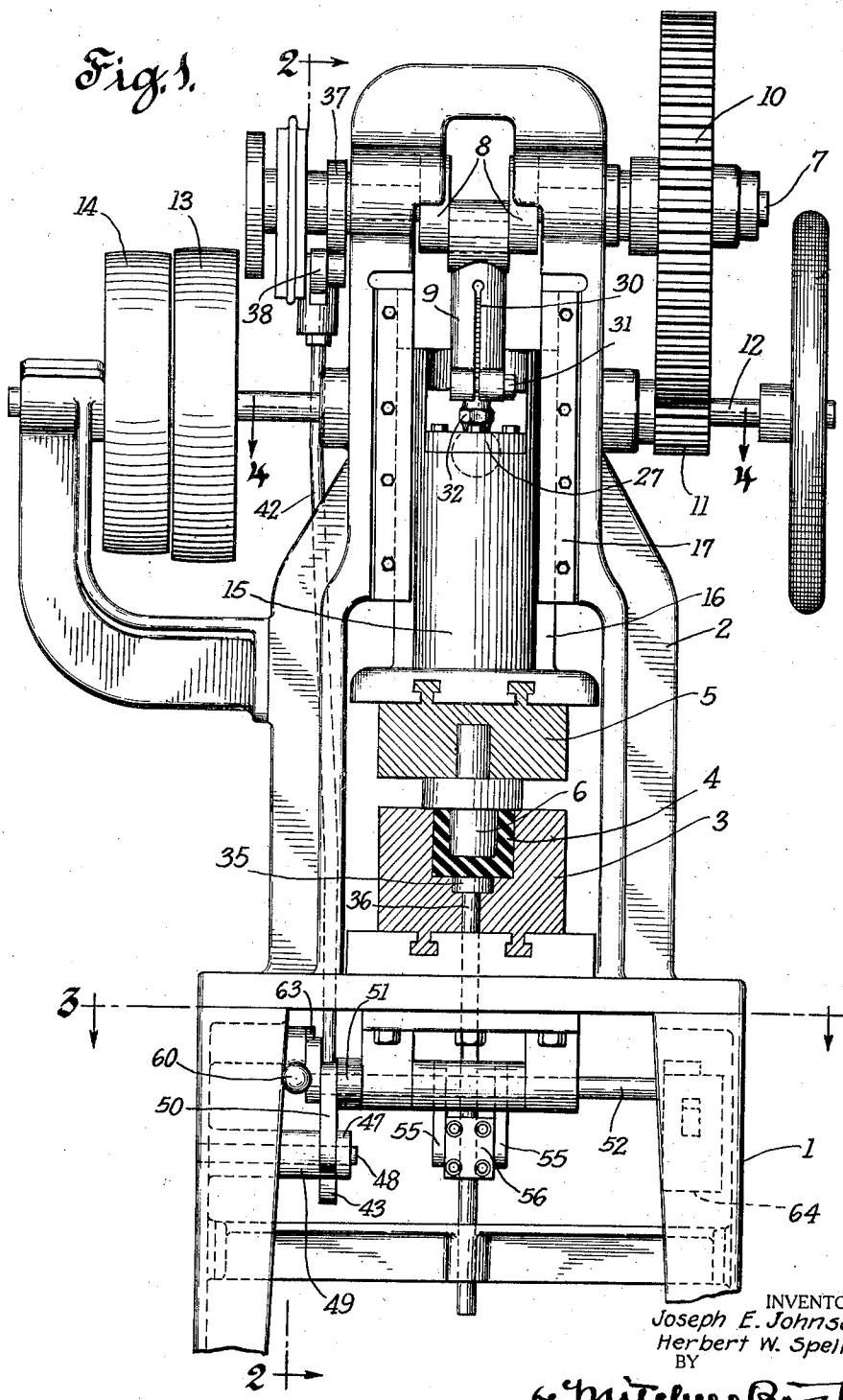
Feb. 9, 1926. 1,572,724

J. E. JOHNSON ET AL

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Filed Sept. 8, 1923 3 Sheets-Sheet 1

Fig. 1.



INVENTORS
Joseph E. Johnson
Herbert W. Spellman
BY
ATTORNEYS

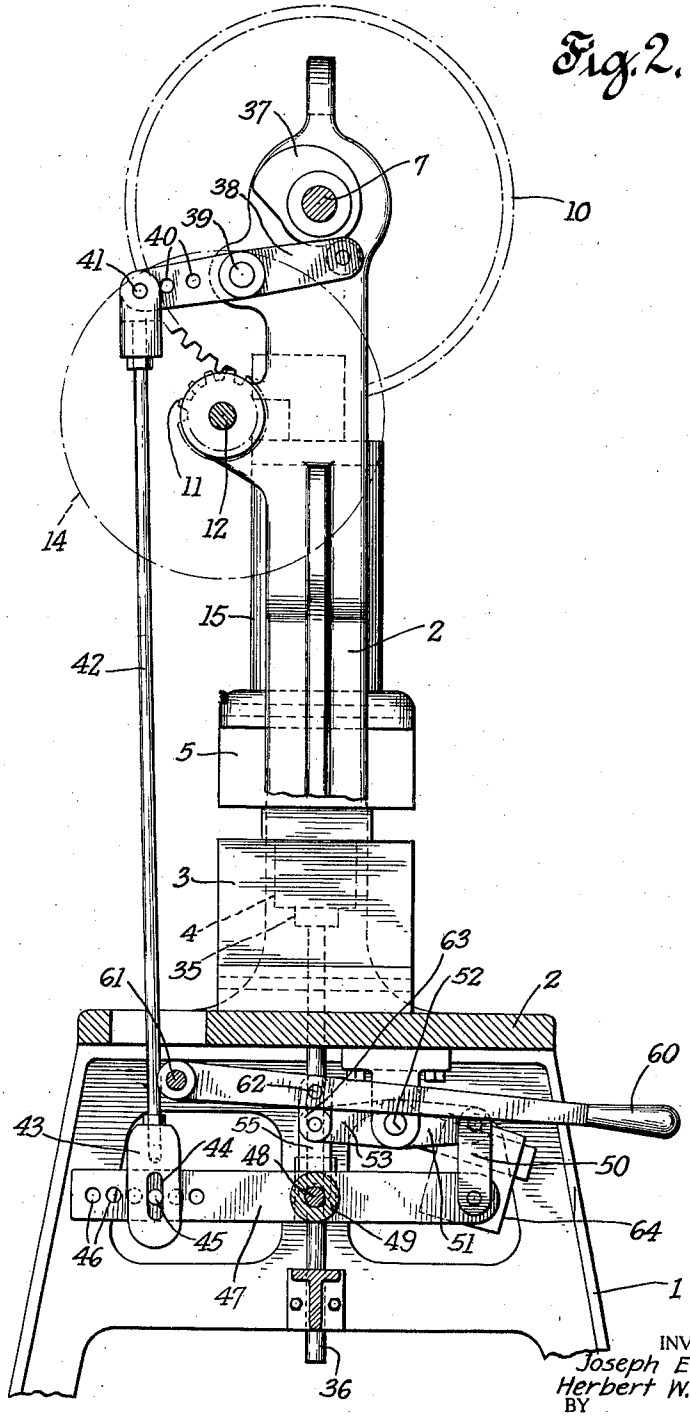
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J. E. JOHNSON ET AL

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Fig. 2.



INVENTOR
Joseph E. Johnson
Herbert W. Spellman
BY
by Mitchell Brothers
ATTORNEYS.

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J. E. JOHNSON ET AL

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Fig. 3.

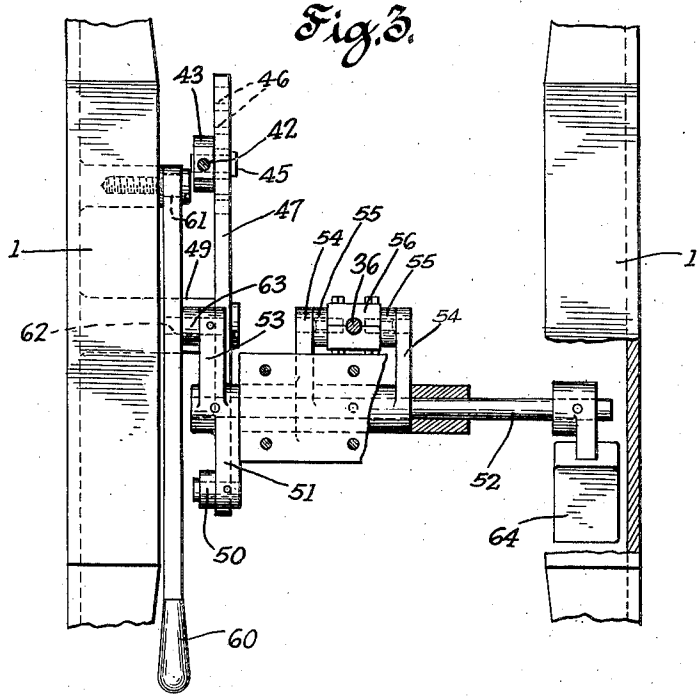


Fig. 5.

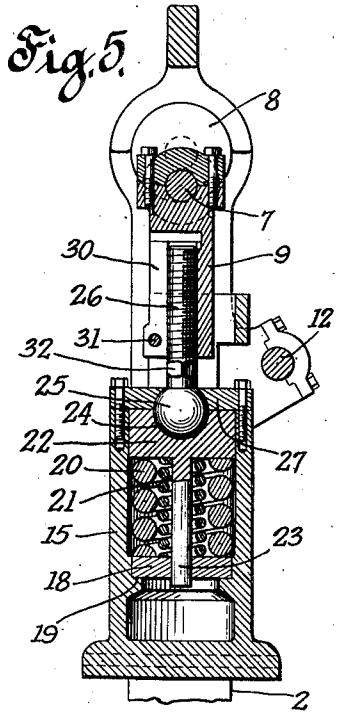
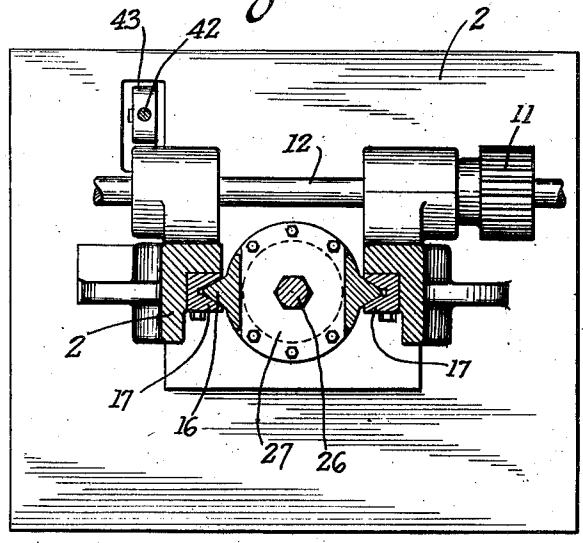


Fig. 4.



INVENTOR
Joseph E. Johnson
Herbert W. Spellman
BY
Mitchell Brothers
ATTORNEYS.

Patented Feb. 9, 1926. 1,572,724

UNITED STATES PATENT OFFICE.

JOSEPH E. JOHNSON AND HERBERT W. SPELLMAN, OF MERIDEN, CONNECTICUT, ASSIGNORS TO THE CONNECTICUT TELEPHONE & ELECTRIC COMPANY, INCORPORATED, OF MERIDEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

POWER PRESS.

Application filed September 8, 1923. Serial No. 661,590.

To all whom it may concern:

Be it known that we, JOSEPH E. JOHNSON and HERBERT W. SPELLMAN, citizens of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Improvement in a Power Press, of which the following is a specification.

Our invention relates to a power press, and is of a type particularly adapted for molding small articles, such as electrical fittings, etc.

It is an object of the invention to provide novel means in a power press for relieving an excessive pressure which may be developed during the pressing operation.

It is a further object to provide novel automatically actuated means for ejecting a molded article from the press.

It is a further object to provide a manually operable knock-out device which may be used in conjunction with an automatic knock-out device.

Other objects and features of the invention will be apparent as the specification proceeds.

In the drawings which show, for illustrative purposes only, a preferred form of the invention—

Fig. 1 is a view in front elevation, with parts shown in section, of a power press embodying features of our invention;

Fig. 2 is a vertical sectional view taken substantially in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view, taken substantially in the plane of the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken substantially in the plane of the line 4—4 of Fig. 1;

Fig. 5 is an enlarged vertical sectional view of a pressure relief means.

In the form of power press shown, 1 indicates a suitable base or foundation portion having the upper frame portion 2 thereon. On the bed of the press is what may be termed a die-block 3, having a mold or die cavity 4 therein. 5 indicates a press platen having a suitable die punch 6 for co-action with the die cavity 4. In the frame 2 is journaled a crank shaft 7, having a crank 8 for operating the press platen through the medium of the connecting rod 9. In the preferred form shown the shaft 7 is provided with a gear 10, which meshes with a pinion 11 on the main driven shaft 12 and suitable means, such as the pulley 13, may be used for driving shaft 12. 14 indicates a loose pulley. A press as thus far described is not novel and is, in fact, of conventional form.

The press platen in the preferred construction has preferably a tubular extension 15 extending upwardly therefrom, and the extension 15 has slides 16—16 movable in suitable guideways or tracks 17—17 on the main frame members 2, for guiding the platen. The tubular extension in the form shown (see Fig. 5) has a plate 18, resting on abutments or lugs 19 formed integrally with the tubular extension. Concentric coil springs 20 and 21 are positioned in the tubular extension and rest upon the plate 18, while a pressure head 22 is slidably fitted in the tubular extension and abuts the upper ends of the springs. A guide rod 23 may pass through an aperture in the plate 18 and serve, in connection with the inside of the tubular extension, to guide the head 22 and prevent the latter from binding. The upper end of the head 22 has a hemispherical socket 24 therein, for the reception of the spherical head 25 on the rod 26 forming part of the connecting rod 9. A retaining or cover plate 27 has a passage therein for the rod 26, and is preferably formed to fit the spherical head 25, as will be clear from Fig. 5.

In the preferred form the springs 20 and 21 are under substantial compression, and the cover plate 27 serves as an abutment, against which the head 22 abuts. The plate 27 likewise normally maintains the spherical head 25 in engagement with the head 22. It will be seen that, upon the development of an excessive pressure during the molding of an article, the spherical head 25 and head 22 may move away from the plate 27, that is, toward the die punch against the force

of the springs, and the excessive pressure will be relieved and breakage of any parts of the machine thus prevented.

The rod 26 forming part of the connecting rod is preferably in threaded engagement with a split socket member 30 forming the remaining portion of the connecting rod. A screw 31 may engage the split socket for tightly clamping the rod 26 in adjusted position. It will be seen that, since the direct connection between the platen and the rod 26 is through the spherical head 25, adjustment may very readily be made by turning the rod, and, if desired, the rod 26 may be angularly formed, as at 32, for the reception of a suitable wrench.

By the adjustment just described it is an easy matter to vary the lower limit of travel of the die punch. Springs of various strengths may be used in the pressure relief device and the strength of the spring, as well as the extent to which it is compressed, will determine the pressure at which the spring will yield to relieve the pressure.

The mold or die cavity (Figs. 1 and 2) has a knock-out or ejecting head 35. As will be readily understood, this head may form the entire bottom of the mold cavity or may be what is commonly called a die pad. In any event, the knock-out device is provided with a rod 36 extending through the block 3 and to the outside of the bed.

In order to actuate the knock-out rod 36 for causing a molded article in the mold cavity to be ejected by the head 35, we provide automatic means and also preferably manual means, operable independently thereof or in conjunction therewith. In the form shown the crank shaft 7 is provided with a cam 37 so that, upon each complete rotation of the shaft 7 and the consequent complete rotation of the crank, which, of course, completes one stroke of the press, the cam 37 will make one revolution. A follower lever 38 is pivoted to the main frame at 39, and is engaged at one end by the cam 37 for oscillating the same. The opposite end of the follower lever 38 may be provided with a plurality of apertures 40 for the reception of a pin 41 for securing the connecting link 42 thereon in various positions along the lever. The opposite end of the link 42 is provided with a plate 43, having an elongated slot 44 therein for the reception of a pin 45 in one of the apertures 46 in the lever 47. The lever 47 is pivoted at 48 on a boss 49 on the frame. The end of the lever 47 opposite the link 42 is connected by means of a link 50 with a lever 51, secured on the shaft 52. In the form shown the lever 51 is formed integrally with a second lever 53, for a purpose to be described, and both levers are secured on the shaft 52. At a point adjacent the rod 36 the shaft 52 is provided with a double lever having arms 54—54, and from the ends of the lever arms 54—54 extend a pair of links 55—55. A head 56 is clamped about the knock-out rod 36 and the links 55 are pivotally secured to said head, whereby, upon a raising of said links, the said head, and consequently the knock-out rod 36 and knock-out head 35, will be elevated to eject a molded article from the mold cavity.

In conjunction with the automatic means for actuating the knock-out device there may be provided a manually operable device. In the form shown, a hand lever 60 is pivoted to the main foundation or frame at 61. The lever 60 at a point 62 is connected by means of the link 63 with the lever 53, which is integral with the lever 52 secured in the shaft, so that, upon a raising of the lever 60, the knock-out head 35 will be elevated in the same manner as when actuated by the automatic device. If desired, a counterweight 64 may be provided for counterbalancing a part of the weight of the knock-out head and associated mechanism and linkage.

The operation of the device is as follows:

Suitable means, such as an automatic clutch (not shown) would be provided for causing the press platen to stop at substantially the upper limit of its stroke, and to remain in such position until tripped by a hand or foot lever, not shown but well known to those skilled in the art. After filling the mold cavity with moldable compound the press platen descends so as to cause the die punch to enter the die cavity and mold the article. If, for any reason, the die cavity is too full or for any other reason an excessive pressure should be developed during the pressing operation, the springs 20—21 in the tubular extension 15 will yield and may thus prevent damage to any part of the machine. It is, of course, to be understood that springs of various strengths may be put in the tubular extension so that the press will yield at any desired predetermined point. When the molded article has been formed and the press platen ascends the cam 37 on the crank shaft 7 will actuate the lever 38 which, through the medium of the connecting link 42, will actuate the lever mechanism, comprising lever 47, link 50, lever 51, shaft 52, bifurcated lever 54 and links 55, so as to cause the knock-out head 35 to rise and eject the molded article. It will be seen that, if the article is not properly ejected by the automatic means before the knockout head descends, as it will do when the cam is in the position shown in Fig. 2, the hand lever 60 may be used to again raise the knock-out head and eject the molded article. The hand lever 60, as will be clear, operates the knock-out through the medium of the link 63, lever 53, shaft 52, bifurcated lever 54 and links 55 connected to the head 56. The pin and slot connection between

the link 42 and the lever 47 will permit the proper manual actuation of the knock-out head substantially independently of the automatic means.

While we have disclosed a preferred form of the invention we do not wish to be strictly limited thereto, since changes may be made within the scope of the appended claims.

We claim:

1. In a pressure relief device for a press, a platen, a tubular housing member thereon, a compression spring in said housing member, a head engaging said compression spring, a connecting rod engaging said head, and means for confining said head and connecting rod.

2. In a pressure relief device for a press, a platen including a tubular extension, a compression spring in said tubular extension, a head in said extension and engaging said compression spring, a connecting rod having a ball and socket connection with said head, and a plate over the end of said tubular extension and normally engaged by said head and ball and socket connection.

3. In a pressure relief device for a press, a platen including a tubular extension, a compression spring in said tubular extension, a head engaging said spring, a connecting rod connected to said head, and a plate engaging said head and secured to said tubular extension for normally maintaining said compression spring under stress.

4. In a pressure relief device for a press, a platen including a tubular extension, a compression spring in said tubular extension, a head engaging said spring, a connecting rod connected to said head, and a plate engaging said head and secured to said tubular extension for normally maintaining said compression spring under stress, said head being movable away from said plate by said connecting rod, to compress said spring.

5. In a press, a member having a mold cavity therein, a knock-out head in said mold cavity and extending to the outside thereof, a die punch, link mechanism connected to said knock-out, and automatically actuated operating means for moving said knock-out in said mold cavity for ejecting a molded article.

6. In a press, a member having a mold cavity, a knock-out head in said cavity and extending to the outside thereof, automatic means connected to said knock-out head for moving the same to eject a molded article from said mold cavity, and manual means operable independently of said automatic means for moving said knock-out head.

7. In a power press, a member having a mold cavity therein, a press platen having a die punch for co-action with said mold cavity, a knock-out head in said mold cavity and extending to the outside thereof, a crank shaft and crank for actuating said press platen, a cam on said crank shaft, link mechanism actuated by said cam and connected to said knock-out device for moving the latter to eject a molded article from said mold cavity, and manual means operable independently of said cam for ejecting a molded article.

8. In a press, a frame, a member having a mold cavity therein, a knock-out device in said cavity and extending to the outside thereof, a press platen having a die punch for co-action with said mold cavity, a crank shaft journaled in said frame, a crank for actuating said press platen, a cam on said crank shaft, a lever pivoted on said frame and operable by said cam, a link connected to said lever, and link mechanism connected to said link with a pin and slot connection, said link mechanism being connected to said knock-out device and serving to eject a molded article from said mold cavity.

9. In a press, a frame, a member having a mold cavity therein, a knock-out device in said cavity and extending to the outside thereof, a press platen having a die punch for co-action with said mold cavity, a crank shaft journaled in said frame, a crank for actuating said press platen, a cam on said crank shaft, a lever pivoted on said frame and operable by said crank, a link connected to said lever, link mechanism connected to said link with a pin and slot connection, said link mechanism being connected to said knock-out device and serving to eject a molded article from said mold cavity, and manual means connected to said link mechanism for moving said knock-out device.

10. In a press, a member having a mold cavity, a knock-out device in said mold cavity, automatic means for actuating said knock-out for ejecting a molded article, and manual means for actuating said knock-out and holding the same in ejecting position.

11. In a press, a member having a mold cavity therein, a die punch, means for actuating one of said members for compressing a molded article, a knock-out device in said mold cavity, a cam operable by said actuating means, a lever operable by said cam, a link connected to said lever, lever mechanism connected to said knock-out device and to said link whereby upon actuation of said cam said knock-out device will be moved to eject a molded article.

12. In a press, a frame, a member having a mold cavity therein, a knock-out device in said mold cavity, a lever pivoted on said frame, a shaft, a second lever on said shaft, a knock-out actuating lever on said shaft, links connecting said last mentioned lever to said knock-out device, and means for operating one of said levers for moving said knock-out device to eject a molded article.

13. In a press, a frame, a member having a mold cavity therein, a knock-out device in

said mold cavity, a die punch, crank means for operating said die punch, a cam operated by said crank means, a lever pivoted to said frame and co-acting with and operable by said cam, lever mechanism on said frame and connected to said knock-out means for actuating the same, and a link connecting said pivoted lever and lever mechanism whereby said cam acting through said pivoted lever and link and lever mechanism may actuate said knock-out device for ejecting a molded article.

JOSEPH E. JOHNSON.
HERBERT W. SPELLMAN.