

April 21, 1931.

A. C. WISNER

1,801,893

INVERTED HYDRAULIC RAM PRESS

Filed July 5, 1928

6 Sheets-Sheet 1

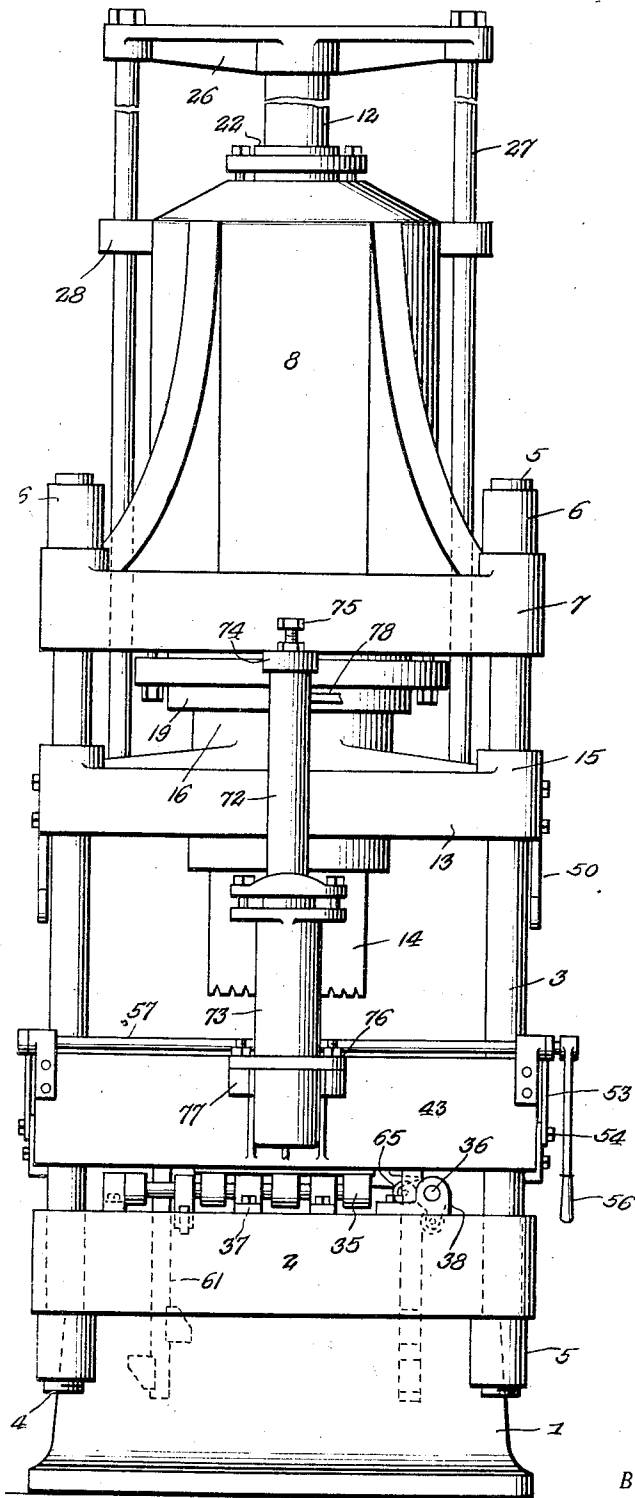


Fig. 1.

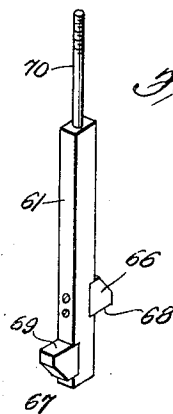
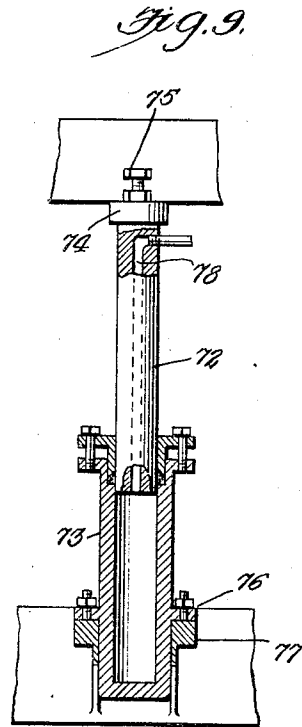
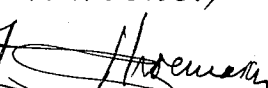


Fig. 10.

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6 Sheets-Sheet 2

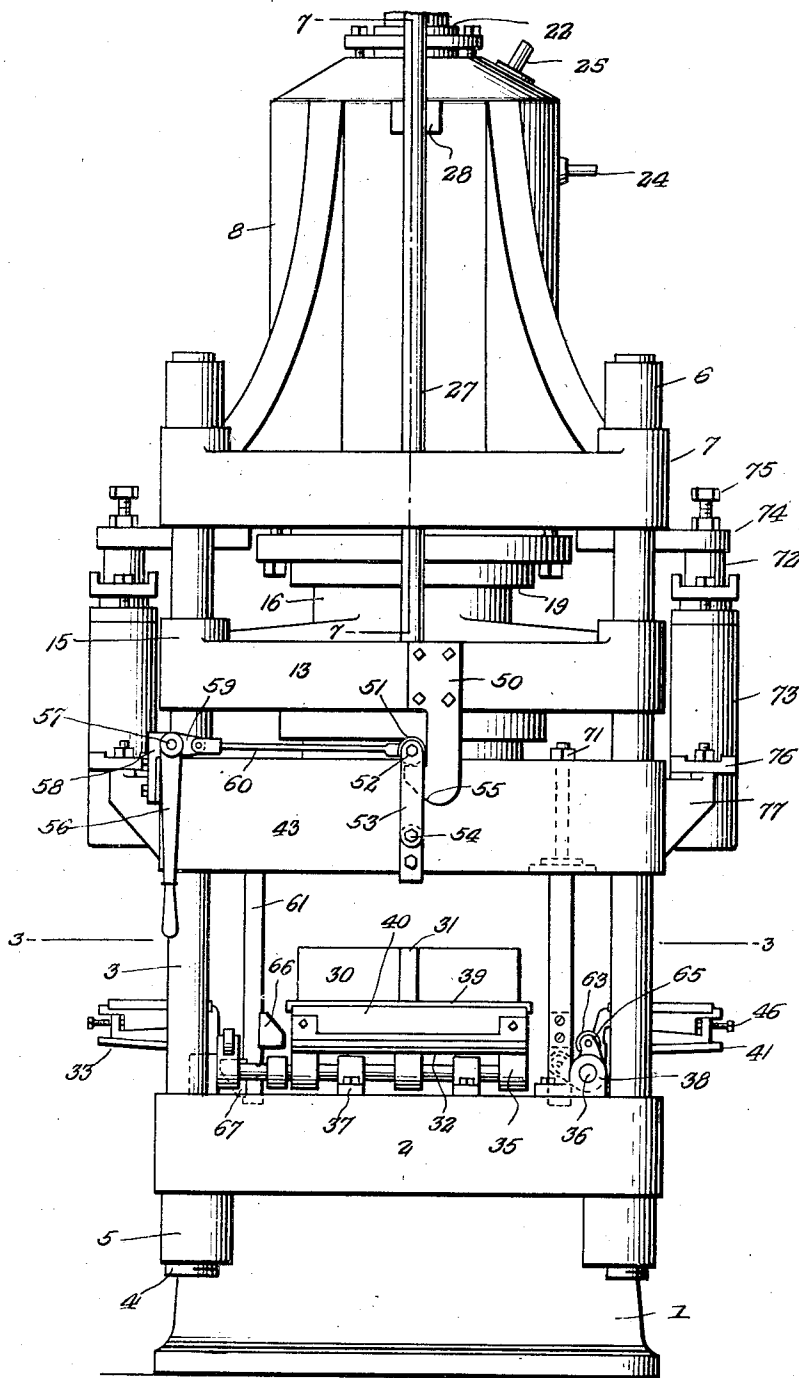


Fig. 2.

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Fig. 3.

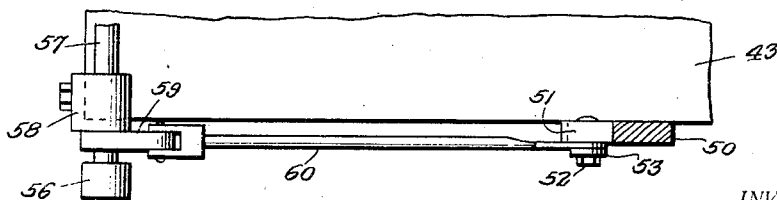
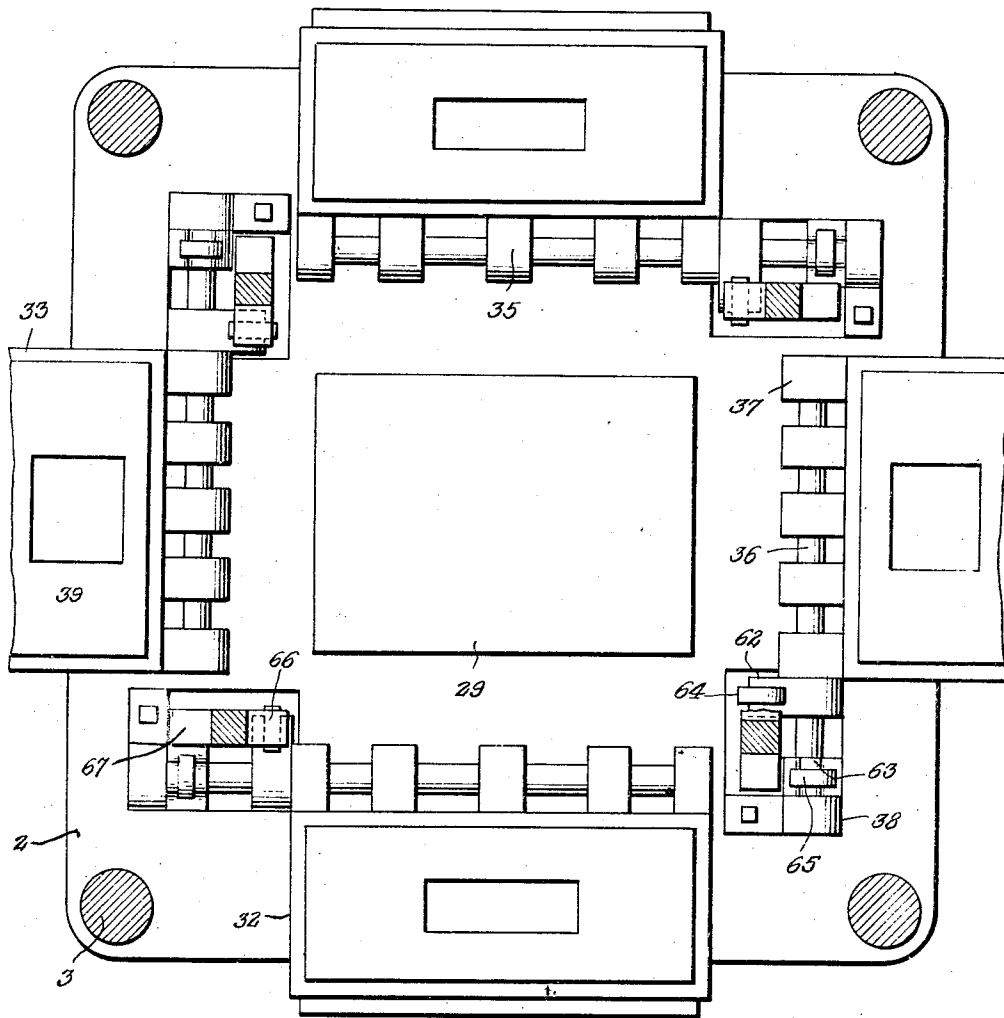


Fig. 4.

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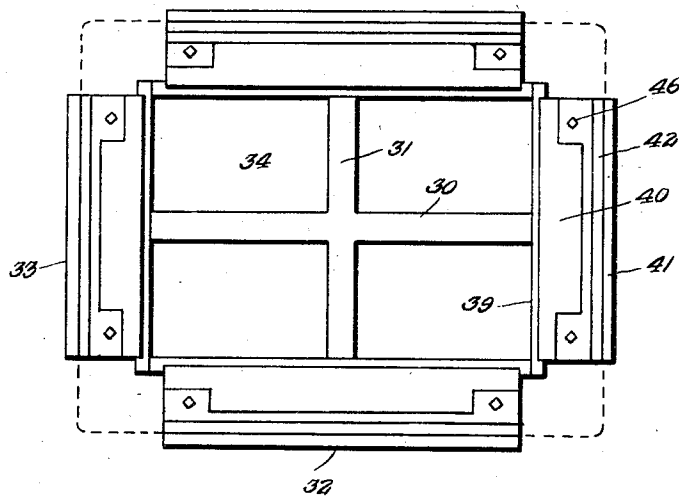
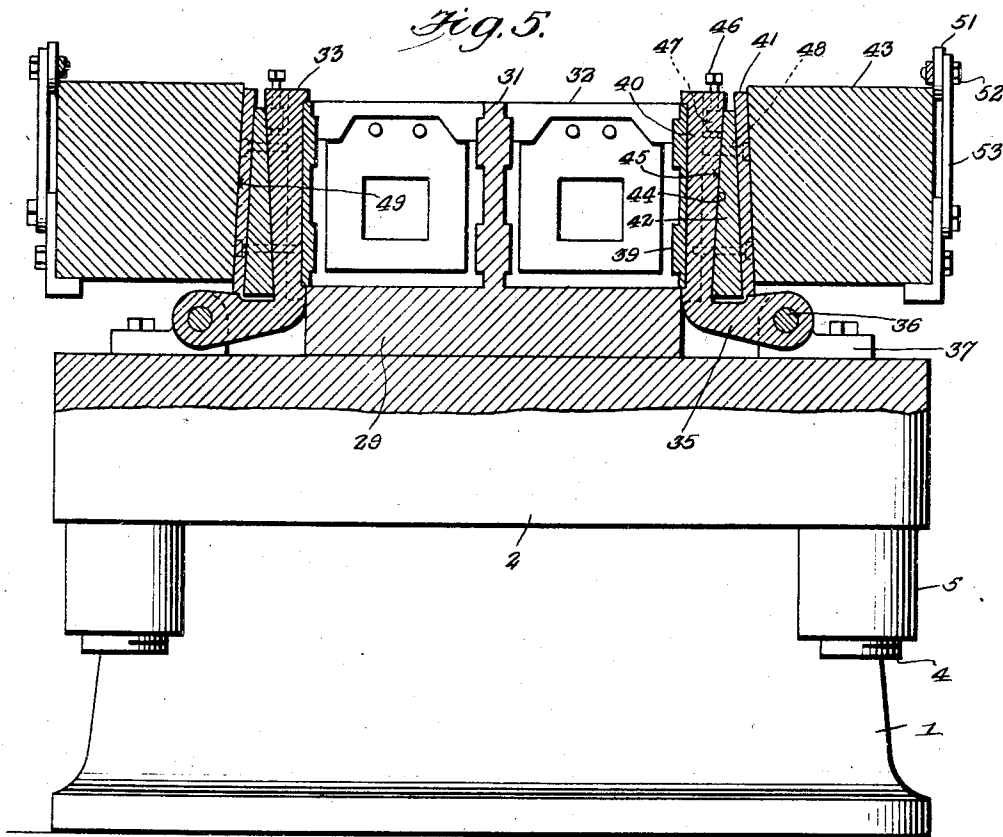


Fig. 6.

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Fig. 7.

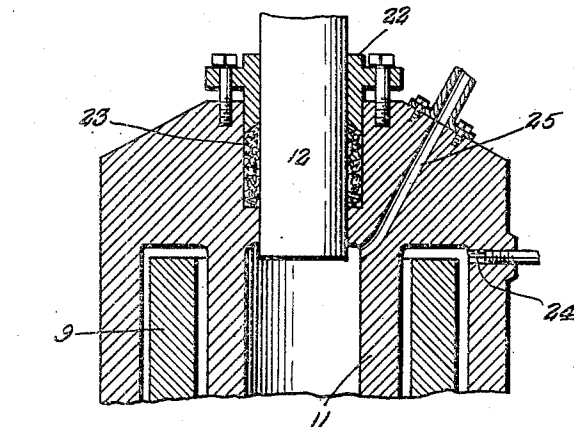
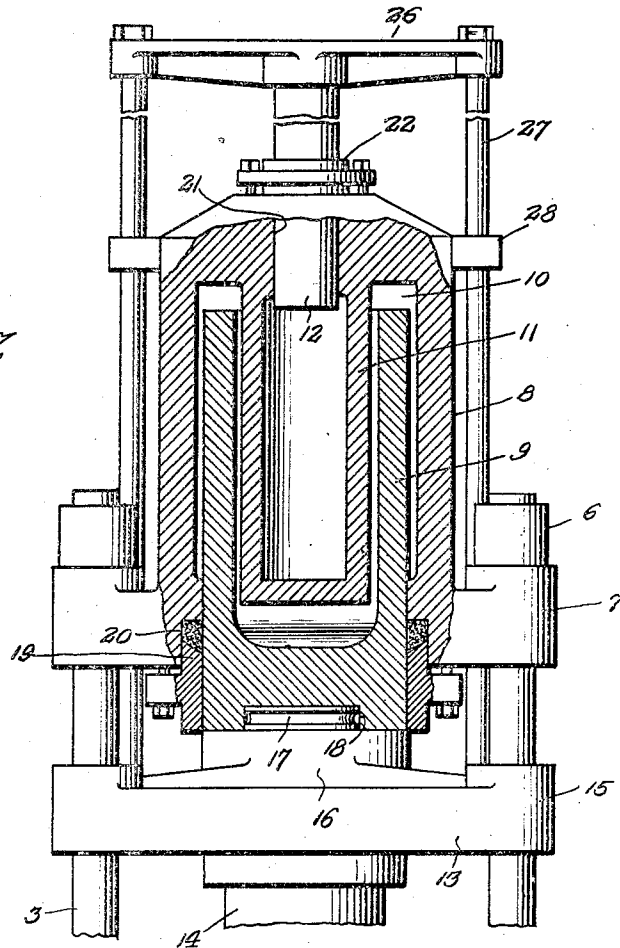


Fig. 8.

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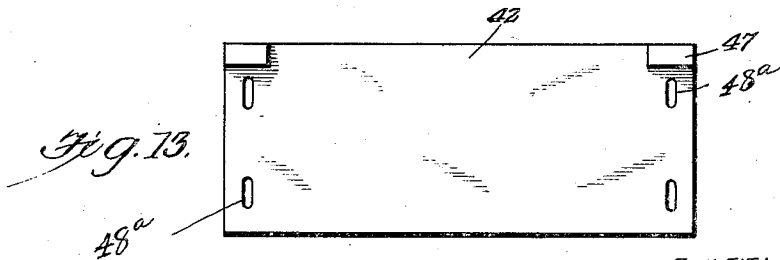
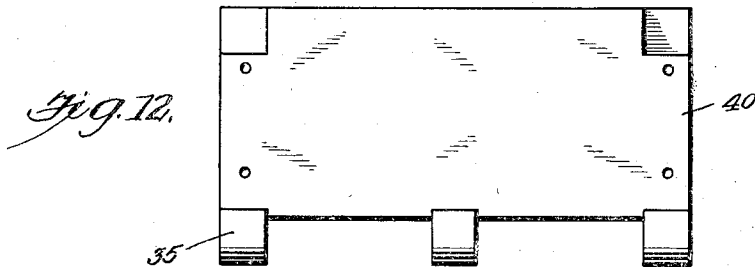
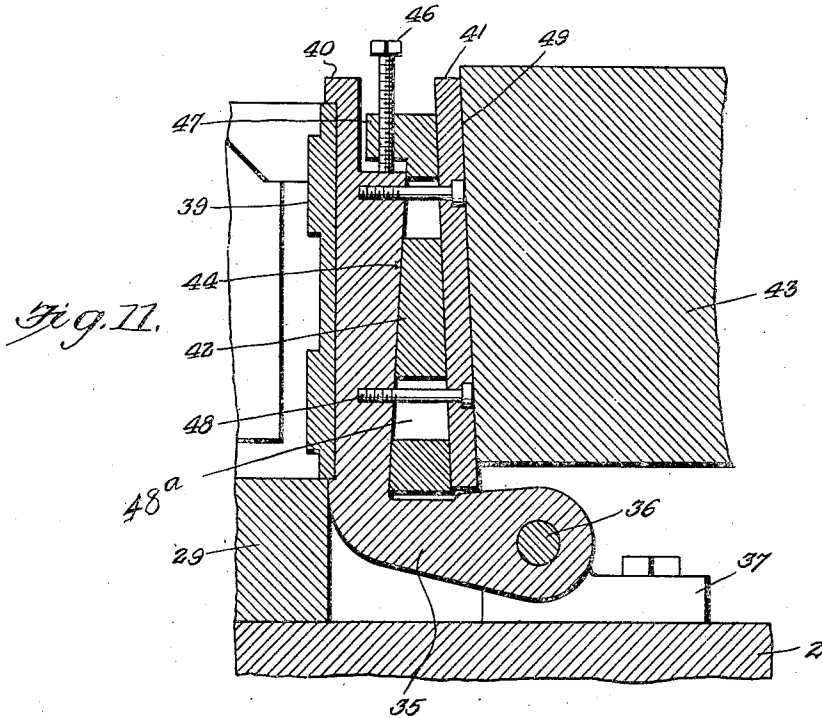
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Filed July 5, 1928

6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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INVERTED HYDRAULIC RAM PRESS

Application filed July 5, 1928. Serial No. 290,597.

The invention relates to an inverted hydraulic ram press.

An object of the present invention is to improve the construction of inverted hydraulic ram presses for molding from plastic insulating and other material battery cases and various other articles to provide a simple, practical and efficient hydraulic press of strong, durable and comparatively inexpensive construction equipped with a collapsible mold having walls adapted to swing outwardly and downwardly and upwardly and inwardly for releasing the molded articles to permit the same to be readily removed from the press, and to reassemble or arrange the mold for molding another article or set of articles.

A further object of the invention is to provide a hydraulic ram press of this character equipped with a frame or chase movable into engagement with the collapsible walls of the mold for firmly supporting the same and for enabling the collapsible mold to withstand the pressure incident to molding battery cases and other articles, and movable out of engagement with the collapsible mold to permit the opening of the mold and the ready removal of the molded articles.

Another object of the invention is to provide means for automatically raising and lowering the frame or chase during the operation of the press and for also automatically opening and closing the collapsible mold when the chase or mold confining frame is raised and lowered.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—

Figure 1 is a front elevation of an inverted hydraulic ram press constructed in accord-

ance with this invention, the hinged walls of the collapsible mold being arranged in an upright position and the upper platen being at the limit of its upward movement.

Fig. 2 is a side elevation of the same, the collapsible mold being open and the upper platen being at the limit of its upward movement supporting the chase in an elevated position.

Fig. 3 is a horizontal sectional view taken substantially on the line 3—3 of Fig. 2.

Fig. 4 is a detail plan view illustrating the manually operable lever for releasing the chase from the hooks of the upper platen.

Fig. 5 is a vertical sectional view partly in elevation of the lower portion of the press illustrating the construction of the collapsible mold, parts being omitted for convenience of illustration.

Fig. 6 is a plan view of the collapsible mold showing the same in closed position.

Fig. 7 is a vertical sectional view of the upper portion of the hydraulic press taken substantially on the line 7—7 of Fig. 2.

Fig. 8 is a detail sectional view of the upper portion of the press illustrating the arrangement of the ports or passages for the introduction and removal of fluid pressure of the main ram and the lifting ram.

Fig. 9 is a vertical sectional view illustrating the construction of the rams for lowering the chase to return the same to the collapsible mold.

Fig. 10 is a detail perspective view of one of the push rods for opening and closing the hinged sections of the collapsible mold.

Fig. 11 is a vertical sectional view through one side of the mold illustrating the operation of the wedges.

Fig. 12 is a detail view of the inner section or plate of the hinged sides of the mold.

Fig. 13 is a detail view of one of the adjustable wedges.

In the accompanying drawings is illustrated by way of example an inverted hydraulic ram press for molding for battery cases but the improvements are applicable to single, double or quadruple presses of this character, that is, presses for molding one, two or four battery boxes, the inner fixed

walls of the mold shown in the accompanying drawings being omitted and the mold being properly proportioned for molding a single battery box at each operation of the press and two of the fixed partitions and inner walls being omitted and the mold properly proportioned when it is desired to mold two battery boxes at each operation of the press. Also, instead of molding battery cases various other articles may be molded by obvious changes in the form of the collapsible mold as will be readily understood. The hydraulic press which in the embodiment shown in the drawings is designed for molding battery cases of bakelite or other plastic material comprises in its construction a base 1 constructed of suitable metal and supporting a horizontal bed 2 either rigidly mounted on or formed integral with the base 1 and projecting beyond the same and pierced by corner guide posts 3 which have lower threaded ends 4 for the reception of nuts 5 located at the lower face of the bed plate and securing the corner posts in suitable openings of the latter. The upper ends 5 of the corner guide posts are threaded for the reception of nuts 6 which secure an upper stationary platen 7 to the upper portions of the guide posts 3 as clearly illustrated in Figs. 1 and 2 of the drawings.

The stationary horizontally disposed platen 7 is formed integral with an upper main ram cylinder 8 vertically disposed and closed at its upper end and open at its lower end to receive a cylindrical ram 9. The cylindrical ram 9 is open at its upper end and closed at its lower end and operates in an annular space 10 formed by the walls of the ram cylinder 8 and a hollow vertical core 11 closed at its lower end and open at its upper end to form a ram cylinder for a lifting ram 12. The stationary platen 7 is rectangular and is pierced by the upper ends of the guide posts 3.

The guide posts 3 receive and guide a vertically movable horizontally disposed platen 13 which carries a centrally arranged depending die or punch 14 composed in the present form of the invention of four punching members shaped to conform to the interior of the battery cases and adapted when the platen 13 is moved downwardly to enter cavities of a collapsible mold mounted on and supported by the bed plate 2 and containing four mold cavities in each of which a battery case is molded. The movable bed plate 13 is rectangular and is provided at its corners with enlargements 15 through which the guide posts 3 pass whereby the movable bed plate 13 is slidable on the guide posts and is adapted to be raised and lowered. The central portion of the movable platen 13 is provided with an enlargement 16 upon which the cylindrical ram 9 is mounted and one of the parts is provided with a shank 17 which is suitably secured in a recess or socket 18 provided in the other part.

While the shank 16 in the accompanying drawings is illustrated as a part of the movable platen 13 and the socket 18 is formed in the lower end of the cylindrical ram 9 yet the shank 17 may be formed on either of the said parts and the socket 18 may be provided in either of the said parts. The main ram cylinder 8 is provided at its lower end with a metallic gland 19 and suitable packing 20 and the cylinder formed by the hollow core 11 and an opening 21 in the top wall of the main ram cylinder 8 is provided with a metallic gland 22 and suitable packing 23. Fluid pressure, which may be either steam, air or liquid, is introduced into the main ram cylinder through a passage 24 for moving the ram and the movable punch carrying platen 13 downwardly, and similar fluid pressure is introduced into the ram cylinder of the lifting ram 12 through a passage 25 for lifting the platen 13 and the main ram to return the same to their elevated position. Any suitable means may be provided for controlling the admission and exhaust of the fluid pressure.

The upper end of the vertically disposed lifting ram 12 is connected by a horizontally disposed yoke 26 with the upper ends of vertically disposed slidable rods 27 passing through horizontally extending guide gears 28 of the main ram cylinder 8 and through the stationary platen 7 and secured at their lower ends to the vertically movable platen 13 whereby the platen 13 and the main ram 9 will be lifted by the lifting ram 12 when fluid pressure is introduced into the lifting ram cylinder and exhausted from the main ram cylinder.

The collapsible mold which in the accompanying drawings is constructed for molding four battery cases at each operation of the hydraulic press comprises in its construction a bottom 29, fixed inner vertical walls 30 and 31 and outer hinged walls 32 and 33. The bottom 29 is suitably mounted on the bed plate 2 and it preferably consists of a separate plate suitably secured to the bed plate. The walls 30 and 31 which may be formed integral with the bottom 29 extends longitudinally and transversely of the mold. The inner vertical walls 30 and 31 terminate adjacent the marginal edges of the bottom 29 to permit the hinged side and end walls 32 and 33 to rest upon and fit against the upper face of the bottom 29 when the hinged side and end walls are arranged in their closed vertical position as clearly illustrated in Fig. 5 of the drawings. The hinged end walls of the mold form the end walls of two of the mold cavities 34 and each of the side walls 32 form the outer sides of two of the said mold cavities 34. While the collapsible mold is illustrated in the accompanying drawings as being constructed for molding four battery cases, it will be clear that by omitting

either the longitudinal or transverse inner walls and properly proportioning the collapsible mold, the latter may be readily arranged for molding two battery cases and by omitting all of the inner walls shown in Fig. 6 and properly proportioning the parts the hydraulic press may be constructed for molding a single battery case at each operation of the hydraulic press. The hydraulic press may, of course, be employed for molding various other articles from bakelite or other plastic material and when articles smaller than battery cases are molded, any desired number within the capacity of the hydraulic press may be molded.

While the inner walls 30 and 31 of the collapsible mold are illustrated in the accompanying drawings, formed integral with the bottom 29, it will be clear that they may be constructed in any other desired manner and the faces of the inner walls 30 and 31 are shaped to form the adjacent faces of the battery cases of the desired configuration.

Each of the hinged outer walls of the collapsible mold is provided at the bottom with arms 35 extending outwardly substantially at right angles from the lower edges of the outer wall of the mold when the said outer wall is in a vertical position and suitably fixed to a horizontal pintle shaft 36 journaled in suitable bearings 37 and 38 of the bed plate. The shafts 36 are preferably located below the plane of the upper face of the bottom 29 of the collapsible mold and beyond the outer faces of the collapsible walls when the latter are in a vertical position and this arrangement will permit the hinged outer walls of the mold to swing downwardly and outwardly from the vertical position illustrated in Fig. 5 of the drawings to the horizontal position shown in Fig. 3 for opening the mold to enable the molded battery cases to be readily removed from the mold cavities and the pintle shafts are adapted to be automatically rotated or rocked during the operation of the hydraulic press by the means hereinafter described to close the mold for arranging the same for molding and for opening the mold after the operation of molding has been completed.

The hinged outer walls of the collapsible mold are preferably provided with a lining 39 having suitable projections and indentations for forming the adjacent faces of the battery cases of the desired configuration. The opening of the collapsible mold will permit the ready removal of molded articles such as battery cases which cannot, owing to the configuration of the molded articles and the inner faces of the outer walls be ejected from the mold by a vertical movement of the molded articles. The opening and closing of the molds also obviate the necessity of removing the linings of the mold cavities to per-

mit the molded articles to be ejected from the mold.

The hinged outer walls of the molds are each composed of an inner main section or plate 40 and an outer plate 41 which is adjustable by means of wedges 42 to vary the distance between the inner and outer faces of the hinged walls of the mold to enable the outer plates 40 to be arranged in tight engagement with a vertically movable substantially rectangular chase or frame 43. The chase or frame 43 which is raised and lowered by means hereinafter described, when in its lowered position as illustrated in Fig. 5 of the drawings, enables the collapsible mold to withstand the pressure incident to molding battery cases and other articles from bakelite or other plastic material and it securely holds the parts of the collapsible mold in place during the molding operation.

The inner section or plates 40 present downwardly and inclined faces 44 to downwardly and inclined inner faces 45 of the wedges 42 so that the raising and lowering of the wedges will effect an inward and outward adjustment of the outer plates 41. The wedges are raised and lowered by means of adjusting screws 46 located at the upper edges of the hinged sections of the mold and engaging lugs 47 of the wedges which are secured in their adjustment by clamping screws 48 passing through slots 48^a of the outer plates 41 and the wedges and threaded into the inner plate or section 40. The outer plates 41 are set at a slight inclination to present slightly inclined outer faces to the inner faces 49 of the chase 43. The inner faces 49 of the chase 43 are correspondingly inclined to fit the inclined outer faces of the plates 41 which have a slight downward and outward inclination. This will enable the chase to wedge tightly against the outer hinged walls of the collapsible mold and at the same time will permit the chase in its upward movement to readily disengage itself from the outer walls of the mold.

The guide posts 3 pass through the chase 43 and guide the same in the upward and downward movement thereof and the said chase is rectangular so as to extend around the four sides of the collapsible mold and form an opening to receive within it the said mold when the chase is lowered from the position illustrated in Fig. 2 of the drawing to that shown in Fig. 1.

The mechanism for lifting the chase to release the hinged walls of the collapsible mold comprises hooks secured to and depending from opposite sides of the vertically movable platen 13 and adapted to engage with rollers 51 carried by the chase 43 and located at opposite sides thereof adjacent the upper face of the chase. The rollers 51 are mounted on suitable spindles 52 carried by links 53 normally arranged in a vertical position as

clearly illustrated in Fig. 2 of the drawings and pivoted at their lower ends to the chase 43 by suitable pivot bolts 54. The hooks 50 are provided at their lower ends with inclined faces 55 located below the bills of the hooks and adapted in the downward movement of the platen 13 to contact with the rollers 51 and swing the links 53 laterally a sufficient distance to permit the bills of the hooks to pass beneath the rollers 51 for engaging the latter to enable the platen 13 to lift the chase when the platen 13 is raised after the operation of molding has been completed. The links 53 are automatically returned to a vertical position to arrange the rollers 51 over the bills or engaging portions of the hooks and this operation is effected by the gravity action of an operating lever 56 secured at its upper end to and depending from a horizontal shaft 57. The shaft 57 which extends across the front of the press and which is journaled in suitable bearing brackets 58 is provided with arms 59 which are connected with the upper ends of the links 53 by rods 60.

The lever 56 which is provided at its lower end with a suitable grip or handle is adapted to be manually operated to swing the links 53 for carrying the rollers out of engagement with the bills of the hooks 50 to permit the chase to be lowered to the collapsible mold by the means hereinafter described. The lever 56 and the shaft 57 with its connections constitutes a gravity device for maintaining the rollers in engagement with the hooks 50 and the said gravity device is adapted to be automatically operated by the hooks in the downward movement of the platen 13 for engaging the hooks with the rollers of the chase.

The hinged outer walls of the collapsible mold are automatically opened when the chase 43 is raised and automatically closed during the downward movement of the chase and are brought to a vertical position before the chase is lowered upon the mold so that the hinged walls of the mold will be in an upright position prior to the chase reaching the limit of its downward movement. This opening and closing movement of the hinged outer walls of the mold is effected by mechanism comprising vertically movable push rods 61 carried by and depending from the chase and arranged to engage rocker arms 62 and 63 of the pintle shafts 36. Each of the pintle shafts 36 is extended at one end and is provided at the extended end with inner and outer rocker arms 62 and 63 which are provided with rollers 64 and 65 adapted to be engaged by inner and outer brackets 66 and 67 carried by the lower portions of the push rods 61.

The brackets 66 and 67 are located at different elevations, the inner bracket being arranged above the plane of the upper face of

the lower bracket. The inner bracket 66 has a horizontal lower face 68 forming a shoulder for engaging the roller 64 of the inner rocker arm 62 during the downward movement of the chase and the outer lower abutment bracket 67 has a horizontal upper face 69 forming a shoulder for engaging the roller 63 of the outer rocker arm 65 during the upward movement of the chase for opening the outer hinged walls of the mold after the chase has been lifted clear of and has released the said outer hinged walls. The push rods 61 are preferably provided at their upper ends with reduced portions or shanks 70 which pierce the chase and are secured to the same by nuts 71 engaging threaded upper ends of the said shanks 70. The push rods may, however, be secured to the chase in any other desired manner as will be readily understood. It will thus be seen that the enclosing of the hinged outer walls with a collapsible mold is entirely automatic and occurs in proper timed relation with the upward and downward movements of the chase 43. In the upward movement of the chase the outer abutment swings the outer rocker arm 63 upward and passes the same as indicated in Fig. 2 of the drawings. This brings the inner rocker arm to a position substantially as indicated in dotted lines in Fig. 2 of the drawings and in the path of the inner bracket 66 so that it will be engaged by the inner bracket 66 in the downward movement of the chase.

This will swing the outer rocker arm downward to substantially horizontal position so as to lie in the path of the outer bracket 67 and be engaged by the same when the chase is moved upwardly. The shoulders are adapted to pass the rollers of the rocker arms and the roller of one of each pair of rocker arms will always be in position to be engaged by one of the brackets of each push rod.

The chase is lowered by means of side rams 72 operated in ram cylinders 73 and located at opposite sides of the hydraulic press as clearly illustrated in Fig. 2 of the drawing. Each of the rams 72 is secured at its upper end to a projecting bracket 74 by a screw 75 or other suitable fastening means and the ram cylinder 73 is provided at opposite sides with attaching flanges 76 which are bolted or otherwise secured to spaced brackets 77 projecting from the chase at opposite sides thereof and preferably formed integral with the same, but any other suitable supporting means may, of course, be employed for mounting the side rams on the vertically movable chase 43. Fluid pressure is introduced into each of the side rams by means of a passage 78 extending through the ram 72 from the upper portion thereof and communicating at the lower end of the ram 72 with the interior of the cylinder 73.

What is claimed is:

1. A hydraulic press including a collapsible mold having movable walls adapted to permit the mold to open and close, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen having means cooperating with the mold, and cooperating means on the platen and the chase for detachably connecting the platen and the chase for raising the chase to release the walls and permit the mold to open when the platen is raised. 70
2. A hydraulic press including a collapsible mold having movable walls adapted to permit the mold to open and close, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen having means cooperating with the mold, and cooperating means on the platen and the chase for raising the chase to release the walls and permit the mold to open, said means including a hook carried by the platen and a device mounted on the chase and arranged to be engaged by the hook. 75
3. A hydraulic press including a collapsible mold having movable walls adapted to permit the mold to open and close, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen having means cooperating with the mold, cooperating means on the platen and the chase for raising the chase to release the walls and permit the mold to open, said means including a hook carried by the platen and a device mounted on the chase and arranged to be engaged by the hook, and manually operable means for moving the said device out of engagement with the hook to permit the chase to move downwardly independently of the platen. 80
4. A hydraulic press including a collapsible mold having movable walls adapted to permit the mold to open and close, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen having means cooperating with the mold, and cooperating means on the platen and the chase for raising the chase to release the walls and permit the mold to open, said means including a hook carried by the platen, a link pivoted to the chase and having a roller arranged to be engaged by the hook, and a gravity acting manually controlled operating means connected with the link for maintaining the same normally in position to be engaged by the hook. 85
5. A hydraulic press including a mold having movable walls and adapted to be opened and closed, a chase surrounding the mold and holding the walls thereof in closed position, a vertically movable platen having means cooperating with the mold, means for detachably connecting the platen with the chase at the end of the downward movement of the platen for raising the chase during the upward movement of the platen, and a hydraulic ram connected with the chase for lowering the same independently of downward movement of the platen. 90
6. A hydraulic press including a mold having hinged walls adapted to swing to and from a vertical position, a chase surrounding the walls of the mold and holding the same in closed position, a vertically movable platen provided with means cooperating with the mold, means for automatically connecting the platen to the chase at the end of the downward movement of the platen to cause the latter to be lifted out of engagement with the mold by the upward movement of the platen. 95
7. A hydraulic press including a mold having hinged walls adapted to swing to and from a vertical position, a chase surrounding the mold and holding the walls thereof in closed position, a vertically movable platen provided with means cooperating with the mold, means for automatically connecting the platen to the chase at the end of the downward movement of the platen to cause the latter to be lifted out of engagement with the mold by the upward movement of the platen, and manually operable means for disconnecting the chase from the platen to permit the chase to move downwardly into engagement with the mold independently of the downward movement of the platen. 100
8. A hydraulic press including a collapsible mold having movable walls and adapted to be opened and closed, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen provided with means cooperating with the mold, means for detachably connecting the platen with the chase at the end of the downward movement of the platen for raising the chase during the upward movement of the platen, and a hydraulic ram connected with the chase for lowering the same independently of downward movement of the platen. 105
9. A hydraulic press including a collapsible mold having movable walls and adapted to be opened and closed, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen provided with means cooperating with the mold, means for detachably connecting the platen with the chase at the end of the downward movement of the platen for raising the chase during the upward movement of the platen, hydraulic rams located at opposite sides of the press and connected with the same, and cylinders mounted on the chase and cooperating with the rams for lowering the chase independently of the downward movement of the platen. 110
10. A hydraulic press including a collapsible mold having movable walls and adapted to be opened and closed, a chase surrounding the mold and holding the walls thereof in closed position, a vertically movable platen having means cooperating with the mold, hooks depending from the platen, links pivoted to the chase and provided with means for engaging the hooks for connecting the platen to the chase for raising the latter to permit the mold to open, and a gravity acting operating lever connected with the shaft and adapted to be manually operated to disconnect the chase from the platen, said lever operating to maintain the links normally in position to be engaged by the hooks. 115

ble mold having movable walls and adapted to be opened and closed, a chase surrounding the mold and holding the walls in closed position, a vertically movable platen provided with means cooperating with the mold, means for connecting the platen with the chase for raising the latter during the upward movement of the platen, brackets carried by the chase and arranged in pairs at opposite sides thereof, and side rams having cylinders mounted on the said brackets, said rams being arranged to move the chase downwardly independently of the movable platen.

11. A hydraulic press including a collapsible mold having hinged at their lower edges and walls adapted to swing inwardly and outwardly to open and close the mold, a chase surrounding the mold and holding the walls in their closed position, said walls being composed of inner and outer sections relatively adjustable to vary the thickness of the individual walls to provide a tight fit between the chase and the mold, both of said inner and outer sections being carried by the walls in their inward and outward swinging movements.

12. A hydraulic press including a chase and a collapsible mold fitting within the chase and having walls hinged at their lower edges and adapted to swing inwardly and outwardly to open and close the mold, said walls being composed of relatively adjustable inner and outer sections, and adjustable wedges interposed between the inner and outer sections of the walls for producing a tight fit between the walls and the chase, both of said inner and outer sections being carried by the walls in their inward and outward swinging movements.

13. A hydraulic press including a collapsible mold having movable walls adapted to open and close the mold, said walls being composed of relatively adjustable inner and outer sections, adjustable wedges interposed between the inner and outer sections of the walls for producing a tight fit between the walls and the chase, adjusting screws for manipulating the wedges and clamping screws connecting the sections of the walls for securing the same in their adjustment.

14. A hydraulic press including a stationary bed, a collapsible mold having fixed inner longitudinal and transverse walls mounted upon the stationary bed and forming the inner walls of four mold cavities, hinged outer walls cooperating with the inner walls mounted upon the bed and adapted to swing to and from a vertical position to open and close the mold, and a vertically movable chase surrounding the mold for holding the hinged walls in their closed position and adapted to be raised to release the hinged walls to permit the mold to open.

15. A hydraulic press including a stationary bed, a mold mounted upon the bed and having a wall hinged at the lower edge and

adapted to swing downwardly from a vertical position to a horizontal position to open the mold and upwardly to a vertical position to close the mold, vertically movable means for holding the hinged wall in closed position and adapted to be raised to release the hinged wall to permit the mold to open, and means for automatically opening and closing the hinged wall when the first mentioned means is raised and lowered.

16. A hydraulic press including a stationary bed, a collapsible mold mounted upon the bed having walls at their lower edges and adapted to swing downwardly from a vertical position to a horizontal position to open the mold and upwardly from a horizontal position to a vertical position to close the mold, a vertically movable chase surrounding the mold and holding the hinged walls in closed position, and cooperating means between the hinged walls and the chase for opening and closing the mold automatically when the chase is raised and lowered.

17. A hydraulic press including a stationary bed, a collapsible mold mounted upon the bed and having walls hinged at their lower edges and adapted to swing downwardly from a vertical position to a horizontal position to open the mold and upwardly from a horizontal position to a vertical position to close the mold, a vertically movable chase surrounding the mold and holding the hinged walls in closed position, rocker arms connected with the hinged walls, and means carried by the chase for engaging and operating the rocker arms to open and close the hinged walls automatically when the chase is raised and lowered.

18. A hydraulic press including a collapsible mold having hinged walls adapted to swing to and from a vertical position to open and close the mold, a vertically movable chase surrounding the mold and holding the hinged walls in closed position, rocker arms connected with the hinged walls, and push rods depending from the chase and provided with projecting means arranged at different elevations and adapted to engage and operate the rocker arms for automatically opening and closing the hinged walls when the chase is raised and lowered.

19. A hydraulic press including a collapsible mold having walls arranged to swing upwardly and downwardly to open and close the mold, pintle shafts carrying the said walls and provided with rocker arms having rollers, a vertically movable chase surrounding the mold and holding the hinged walls in closed position, and push rods depending from the chase and provided with projecting brackets arranged to engage the said rollers and adapted to actuate the pintle shafts when the chase is moved upwardly and downwardly to open and close the mold automatically.

20. A hydraulic press including a stationary bed, a mold mounted upon the bed and having hinged walls arranged to swing downwardly from a vertical position to a horizontal position to open the mold and upwardly from a horizontal position to a vertical position to close the mold, a vertically movable platen provided with means cooperating with the mold, a vertically movable chase surrounding the mold and holding the walls thereof in closed position, means for detachably connecting the chase with the platen at the end of the downward movement of the latter for elevating the chase when the platen moves upwardly, and means operated by the chase for opening and closing the mold.

21. A hydraulic press including a stationary bed, a mold mounted upon the bed and having hinged walls arranged to swing downwardly from a vertical position to a horizontal position to open the mold and upwardly from a horizontal position to close the mold, a vertically movable platen provided with means cooperating with the mold, a vertically movable chase surrounding the mold and holding the walls thereof in closed position, means for detachably connecting the chase with the platen at the end of the downward movement of the latter for elevating the chase when the platen moves upwardly, pressure actuated means for moving the chase downwardly, and cooperating means connected with the walls and with the chase for automatically opening and closing the mold when the chase is raised and lowered.

22. A hydraulic press including a stationary bed, a mold mounted upon the bed and having hinged walls adapted to swing downwardly from a vertical position, a vertically movable platen having means cooperating with the mold, a vertically movable chase surrounding the mold and holding the walls in position, means for automatically connecting the chase with the platen at the end of the downward movement thereof for raising the chase when the platen moves upwardly, manually operable means for disconnecting the chase from the platen, means for moving the chase downwardly independently of the platen, and means controlled by the chase for opening and closing the mold when the chase is raised and lowered.

In testimony whereof I have hereunto set my hand.

ABRAM C. WISNER.