July 27, 1943. P. E. FLOWERS 2,325,119

SLUG PRODUCING PRESS

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FIG. 1.

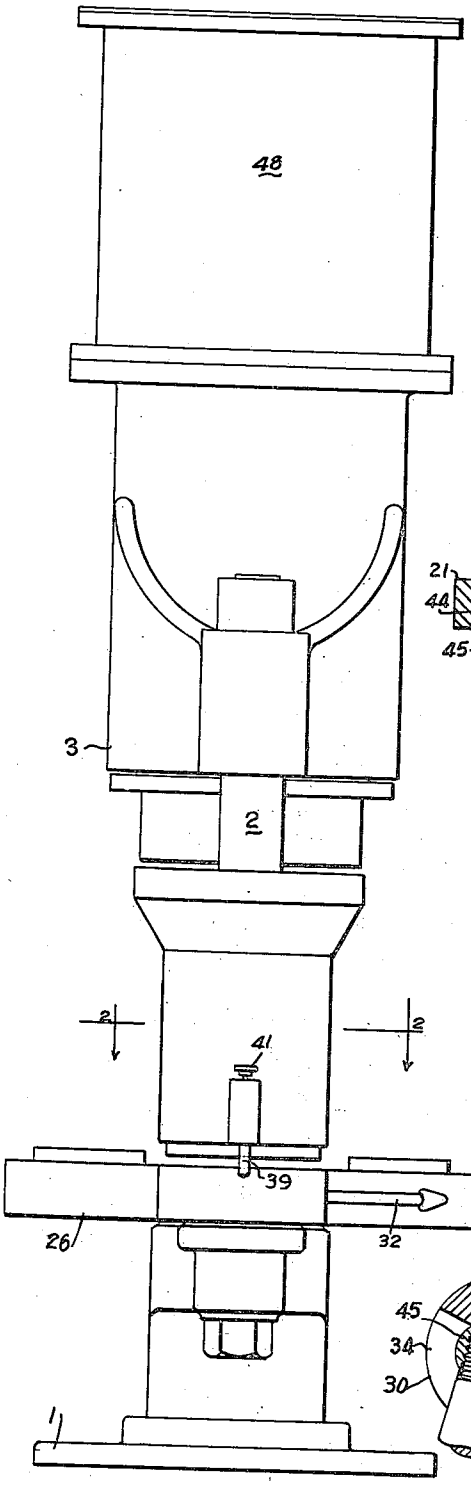


FIG. 2.

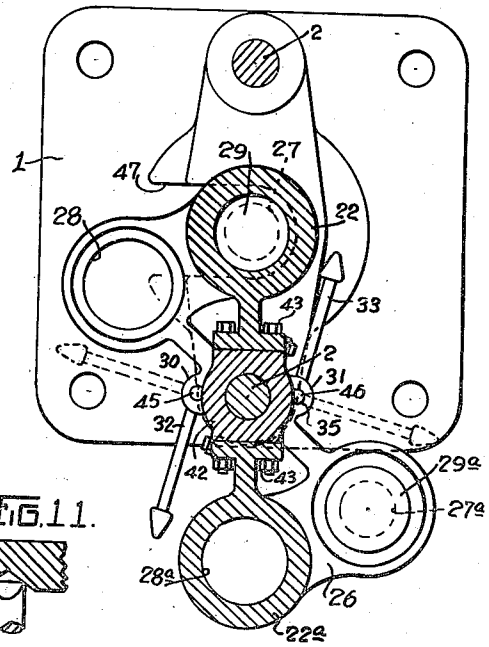


FIG. 11.

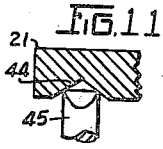


FIG. 3.

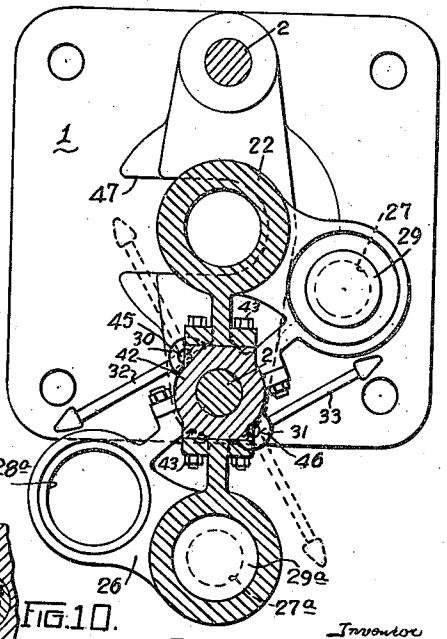


FIG. 10.

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FIG. 4.

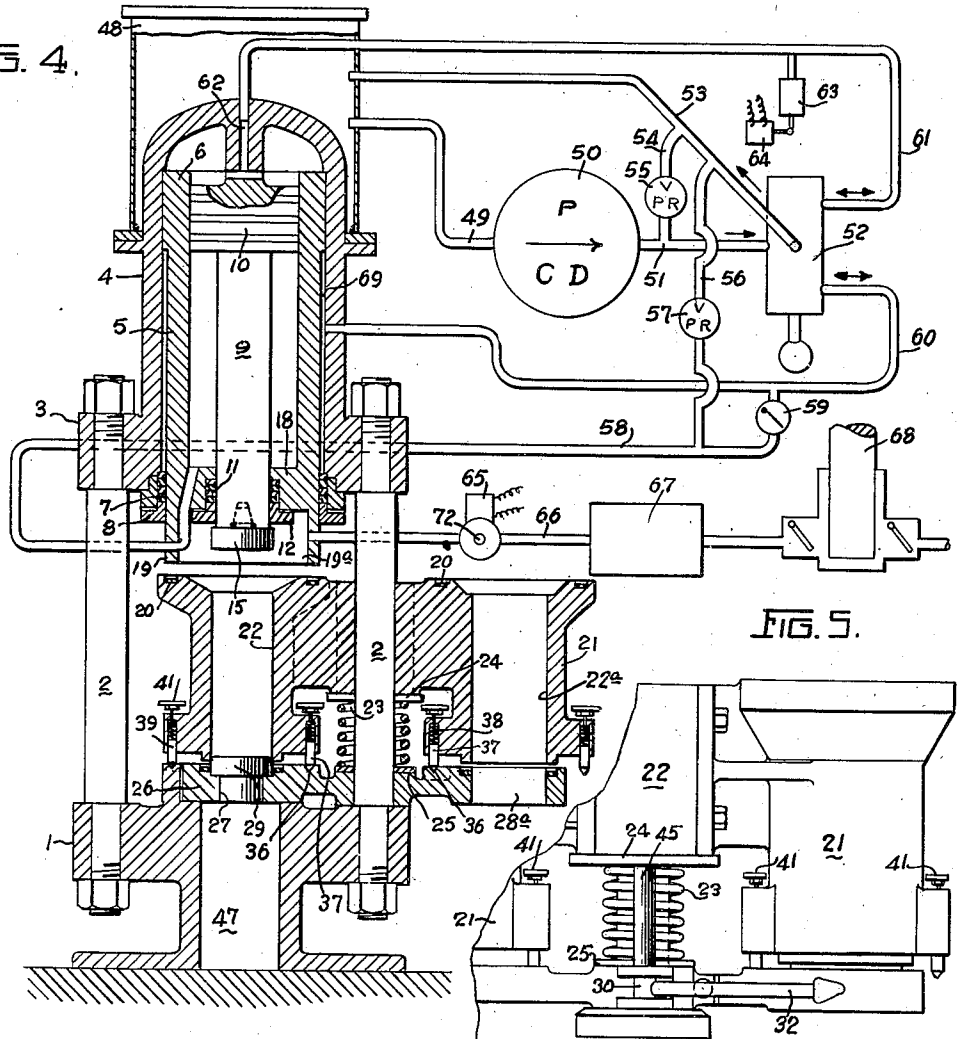


FIG. 5.

FIG. 9.

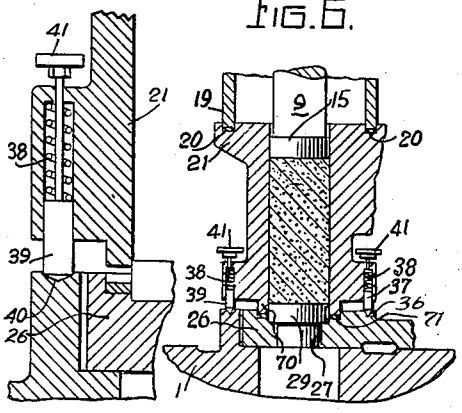


FIG. 6.

FIG. 7.

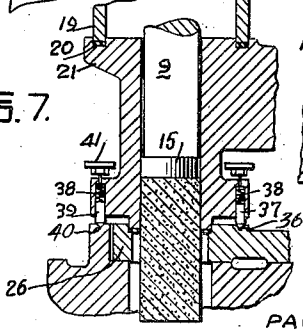
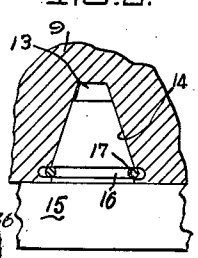


FIG. 8.



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UNITED STATES PATENT OFFICE

2,325,119

SLUG PRODUCING PRESS

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Application December 22, 1941, Serial No. 424,004

16 Claims. (Cl. 18—20)

This invention relates to presses and, in particular, to briquetting or slug producing presses.

One of the main fields of this kind of presses is the forming of coating material into so-called slugs, which are used for coating wires, welding rods, etc.

Presses of this type as heretofore known, work in the manner of a board drop forge hammer. More specifically, the ram is picked up and held while a scoopful of material to be briquetted is thrown into the material receiving chamber or cylinder, whereupon the ram is dropped and literally pounds one charge of the said material on top of another until the full slug is produced. Slugs made by these known presses, however, have the disadvantage that they are built up in laminations and often fall apart at the demarcation line between the said laminations. Moreover, these slugs contain still sufficient air to impair the proper coating operation for wires, welding rods, etc., with the material pressed into a slug.

Accordingly, it is an object of this invention to provide an improved briquetting or slug producing press, which will overcome the above mentioned drawbacks.

It is another object of the invention to provide an improved slug producing press, which will allow an easy cleaning of the material receiving chamber or forming cylinder each time the slug has been formed therein and ejected therefrom.

Another object consists in the provision of a slug producing press, which will make it possible practically to completely de-air the material in the forming cylinder, while said material is being formed into a slug.

It is still another object of the invention to provide a slug producing press, in which the pressing plunger is provided with means for facilitating the separation of said plunger from the formed slug.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

Figure 1 is a side view of a press according to the invention.

Figure 2 illustrates a section along the line 2—2 of Figure 1.

Figure 3 is a section similar to that of Figure 2, however, with the die carrying member in a different position.

Figure 4 shows the press of Figure 1 in section together with the hydraulic system therefor, the scale of Figure 4 being somewhat smaller than that of Figure 1.

Figure 5 is a view of the lower press portion in Figure 4 position.

Figures 6 and 7 show two different phases of the slug forming operation.

Figure 8 illustrates a detail in connection with the ram.

Figure 9 illustrates a detent mechanism which may be used in connection with the press according to the invention.

Figure 10 shows a detail of the die carrying turret.

Figure 11 shows a further detail in connection with the spacing of the turret, carrying the forming chambers, from the turret carrying die members.

Structural arrangement

Referring to the drawings in detail, 1 designates the press bed interconnected by means of strain rods 2 with the press head 3. The press head 3 comprises a main cylinder 4 having reciprocably mounted therein an auxiliary cylinder 5 with a piston portion 6.

To prevent leakage between the main cylinder 4 and the auxiliary cylinder 5, packing material 7 is provided compressed by a gland 8.

Reciprocably mounted in the auxiliary cylinder 5 is the press ram 9 with a double-acting piston portion 10. To prevent leakage between the ram 9 and the auxiliary cylinder 5, packing material 11 compressed by a gland 12 is arranged in the bottom of the auxiliary cylinder 5.

The ram 9 has a conical bore 13 (Fig. 8) engaged by a correspondingly shaped portion 14 of a pressing element or upper die 15. The die 15 is provided with a groove 16 engaged by a detaining spring 17, which holds the die 15 in the ram 9, but allows the die 15 to slip out of the bore 13 when a predetermined pull acts upon the die 15. The lower portion of the auxiliary cylinder 5, beneath the bottom 18 thereof, has a cylindrical extension 19 which is adapted sealingly to engage an annular gasket 20 in the turret 21. The turret 21 is rotatable about one of the strain rods 2 and is provided with two forming cylinders 22, 22*a*, which are widened at their upper end so as to facilitate the filling in of material to be formed in the slug.

The turret 21 is supported by a spring 23 interposed between a wearing plate 24 on the turret 21 and another wearing plate 25 on a die carrying turret 26. The spring 23 is of such thrust as to be able to hold the turret 21 normally spaced from the turret 26. The turret 26

is rotatable about the same strain rod about which the turret 21 carrying the forming cylinders is rotatable.

As will appear more clearly from Figures 2 and 3, the turret 26 is provided with four openings, 27, 28, 27a, 28a, of which the two openings 28, 28a have a larger diameter than the two openings 27, 27a. The diameters of the openings 28, 28a correspond substantially to the diameter of the forming cylinders 22 and 22a.

In the structure shown in Figure 4, the cylinder 22 has a diameter smaller than the cylinder 22a, so as to allow the forming of differently sized slugs, but it is, of course understood that, if desired, the cylinders 22 and 22a may be of the same diameter.

The openings 27, 28, 27a, 28a are arranged so, with respect to each other, that one opening, for instance 27, contains a lower die 29, while the adjacent opening 28 is empty. Similarly, the opening 27a contains a die, while the opening 28a is empty.

The turret 26 is provided with two lugs 30 and 31 having respectively pivotally mounted therein a rod 45, 46, to which are connected operating arms 32, 33. As will be seen from Figures 2, 3 and 10, each lug has a slot 34, 35 in which the respective arm 32, 33 is freely movable. However, when the respective arm 32, 33 has been moved in clockwise direction from one end of the slot pertaining thereto to the other end thereof, further movement of the arms in clockwise direction will cause rotation of the die carrying turret 26.

The die carrying turret 26 is provided with notches 36 adapted to be engaged by respective detent plungers 37, which are reciprocable in the turret 21 and continuously urged by springs 38 against the turret 26. In this way, a proper alignment between the turrets 21 and 26 is assured.

Similarly, detent plungers 39 are provided in the turret 21 and adapted to engage notches 40 in the press bed 1. Figure 9 illustrates a detent plunger, which happens to be one of the detent plungers 39. As will be seen therefrom, the detent plunger 39 is provided with a knob 41 for manually withdrawing the detent plunger from its respective notch.

Although the turret 21 may be a single cast member, it is preferable to form the turret 21 of a plurality of castings comprising a central member to which the forming cylinders 22 and 22a may be connected in any desired manner, preferably by screws 43. In this way, a simple exchange of differently sized forming cylinders is made possible.

The turret 21 is provided at the lower surface of its center portion with an inverted circular V-shaped groove 44 which is engaged by a wedge-shaped end of the rod 45. The slots 34 and 35 are of such a size that when the respective arms 32 and 33 are moved from one end thereof to another end, the rods 45 and 46 will be rotated by 90 degrees. Normally the rods 45 and 46 are in such position that the edge of their wedge-shaped end is substantially in alignment with the adjacent center line of the groove 44 so that the turret 21 may engage the annular gaskets 71 to form a seal therewith. When the rods 45 and 46 are shifted by 90 degrees, so that the edge of their upper wedge-shaped end is transverse to the center line of the adjacent portion of groove 44, a spacing action is exerted upon the turret 21 so as to space the latter from the turret 26 to such an extent that the lowermost surface of the turret 21 is free from the uppermost surface of the dies 29 and 29a, thereby enabling a shifting movement of the turret 21 relative to the turret 26.

The press bed 1 is provided with a recess 47 in alignment with the ram 9 for receiving the formed slugs when ejected by the ram 9.

Mounted on top of the main cylinder 4 is a fluid tank 48 which is connected by means of conduit 49 with the suction side of a pump 50, the pressure side of which is connected by conduit 51 to a four-way valve 52. The four-way valve 52, which may be of standard design, is connected with an exhaust line 53 leading to the tank 48. The conduits 51 and 53 are adapted to communicate with each other through a conduit 54 comprising a pressure relief valve 55. Also communicating with the conduit 53 is a conduit 56, likewise comprising a pressure relief valve, namely valve 57, and leading to a conduit 58. One end of the conduit 58 communicates with the auxiliary cylinder 5, while the other end comprises a check valve 59 and communicates with a conduit 60. One end of the conduit 60 is connected to the annular portion between the main cylinder 4 and the auxiliary cylinder 5 beneath the piston portion 6 of the auxiliary cylinder 5, whereas the other end of the conduit 60 is connected to the four-way valve 52. The four-way valve 52 is furthermore connected by means of conduit 61 with a bore 62 in the upper end of the main cylinder 4.

Also connected to the conduit 61 is a pressure responsive switch actuating mechanism 63 for actuating a switch 64, which is electrically connected with a three-way valve 65 in the conduit 66. The conduit 66 leads to the interior 19a of the cylindrical extension 19 and is connected with a vacuum tank 67. A vacuum is maintained in the tank 67 by means of a vacuum pump 68.

The three-way valve 65 is so arranged that in one position it establishes fluid connection between the chamber 19a and an exhaust line 72, while simultaneously preventing fluid connection between the tank 67 one one hand and chamber 19a and the exhaust line 72 on the other hand. In the other position of the valve 65, fluid connection is established between the tank 67 and the chamber 19a, while fluid connection is prevented between the exhaust line 72 on one hand and the tank and chamber 19a on the other hand.

Operation

Assuming that all parts of the press occupy the position shown in Figure 4, and that the cylinder 22 is filled with the material to be briquetted, the operator, in order to carry out a working cycle, first starts the pump 50 and shifts the four-way valve 52 so as to establish connection between the conduits 61 and 51, while fluid connection is established between the conduits 60 and 53.

Pressure fluid will then be conveyed from the pump 50 through conduits 51 and 61 into the upper portion of the main cylinder 4. This fluid will then cause downward movement of the auxiliary cylinder 5, and fluid expelled by the piston portion 6 of the auxiliary cylinder 5 during its downward stroke will flow from the cylindrical space 69 through conduit 60, four-way valve 52 and conduit 53 into the tank 48. A simultaneous initiation of the downward stroke of the ram 9 is prevented by the check valve 59, since the latter opens only in the direction from conduit 60

into conduit 58, but not vice versa, so that no fluid can escape from beneath the piston portion 10. On the other hand, no fluid can escape from beneath the piston portion 10 through conduits 58 and 56 into conduit 53, since the pressure relief valve 57 only opens after a predetermined pressure has been established in conduit 58.

Consequently, the auxiliary cylinder 5 moves downwardly alone until its cylindrical extension 19 engages the adjacent gasket 20 so as properly to seal the chamber 19a formed by the extension 19 and the bottom 18 of the auxiliary cylinder 5. When the auxiliary cylinder 5 thus comes to a halt, pressure builds up in the upper portion of the main cylinder 4 to such an extent that the ram 9 is forced downwardly and at this time the pressure in conduit 58 reaches such a value as to cause opening of the pressure relief valve 57, thereby enabling the fluid expelled from beneath the piston portion 10 to escape through conduits 56 and 53 into the tank 48.

When the ram 9 has moved downwardly to such an extent that the upper die 15 begins to compress the material in the forming cylinder 22, the friction between the forming material and the wall in the forming cylinder 22 causes the annular extension 70 to engage the adjacent gasket 71 and to form a seal therewith. It will be noted that the extension 19 remains in contact with the gasket 20 due to the fact that the pressure in the upper portion of the main cylinder 4 acts simultaneously on the piston portion 6 of the auxiliary cylinder 5 and on the piston portion 10 of the ram 9.

As soon as the turret 21 engages the gasket 71, as shown in Figure 6, pressure begins to build up in conduit 61, which is conveyed to the pressure responsive device 63 so as to cause the latter to actuate the switch 64, which in its turn causes movement of the three-way valve 65 into such position as to establish connection between the vacuum tank 67 and the chamber 19a, while preventing fluid connection between the tank 67 and chamber 19a on one hand and the exhaust opening 72 on the other hand.

Consequently, a vacuum will be created in the chamber 19a which serves the purpose to de-air the material in the cylinder 22. The vacuum pump 68 is connected with the vacuum tank 67 so as automatically to maintain a predetermined vacuum.

When the ram 9 has compressed the material in the cylinder 22 to the desired extent, the operator actuates the four-way valve 52 so as to establish fluid connection between the conduits 60 and 51, while simultaneously connecting the conduits 53 and 61 with each other. The connection between conduits 51 and 60 immediately causes a drop in the conduit 61, thereby returning the pressure actuating device 63 into its previous position where it disengages the switch 64. Therefore, the circuit controlling the three-way valve 65 is broken, and the latter returns to its previous position in which fluid connection is established between the exhaust opening 72 and the chamber 19a, while fluid connection is interrupted between the tank 67 and the chamber 19a. The vacuum in the chamber 19a is, therefore, broken.

Fluid pressure from the pump 50 now flows through conduit 60, check valve 59 and conduit 58 beneath the piston portion 10 so as to move the latter upwardly. The fluid expelled by the piston portion 10 passes through conduits 61 and 53 into the tank 48. Simultaneously, fluid pressure passes from the pump 50 through conduit 60 beneath the piston portion 6, thereby causing upward movement of the auxiliary cylinder 5. The upward movement of the auxiliary cylinder 5 is followed by an upward movement of the turret 21 due to the expanding force of the previously compressed spring 23.

Due to the smaller retraction area of the piston portion 6 with regard to the retraction area of the piston portion 10, the auxiliary cylinder 5 moves upwardly with a higher speed than the ram 9. As soon as the auxiliary cylinder has been retracted to a predetermined extent, at which time the upper die 15 is still within the cylinder 22, the operator actuates the hand lever 32 so as to swing the same first by 90 degrees, thereby causing the spacer rod 45 connected thereto to lift the turret 21 so as to clear the upper end of the lower die 29 from the adjacent extension 70. Further shifting movement of the lever arm 32 in clockwise direction causes shifting movement of the turret 26.

It will be noted that the detent plungers 37 easily click out of their adjacent notches 36 when the turret 26 is thus shifted. When, during the shifting movement of the turret 26, the plungers 37 again click into corresponding notches in the turret 26, the opening 28 has come into alignment with the cylinder 22. The operator then stops the shifting movement of the turret 26 and shifts the lever 32 in anti-clockwise direction by 90 degrees into its previous position relative to the slot 34. This returns the upper end of the spacer rod 45 into its previous position with respect to the center line of the groove 44. Now the operator reverses the valve 52 so as to again convey fluid from the pump 50 into the upper portion of the main cylinder 4, while exhausting the fluid from beneath the piston portion 10 and the piston portion 6 into the tank 48. Therefore, the auxiliary cylinder 5 again moves downwardly so as to form a seal with the gasket 20 whereupon, as previously mentioned, the ram 9 moves downwardly and ejects the slug in the cylinder 22 into the recess 47 through the opening 28.

While the ram 9 carries out this ejecting operation, the operator fills the cylinder 22a which is now in alignment with the opening 27a carrying a die 29a. As soon as the work piece has been ejected from the cylinder 22, the operator again shifts the valve 52 so as to establish fluid connection between the conduits 51 and 60, while connecting the conduits 61 and 53 with each other. The auxiliary cylinder 5 and ram 9 then again start a retraction stroke, as previously described.

When the auxiliary cylinder 5 and ram 9 have reached the end of their retracted position, they come to a halt and the delivery of the pump 50 is then by-passed through relief valve 55 and conduit 53 into the tank 48.

In case a new working cycle is to be initiated, the operator shifts the arm 33 in clockwise direction so as to cause the rod 46 to lift the turret 21 from the turret 26 to such an extent as to clear the extensions 70 from the dies in the turret 26 and, by further movement of the arm 33, brings the cylinder 22 above the die 29a together with the latter into alignment with the ram 9, whereupon a new cycle may be started, as previously mentioned.

It will be noted that when the die 29 is brought out of alignment with the cylinder 22, as stated, for allowing ejection of the slugs in the cylinder 22, the actuation of the lever arm 32 will not cause a shifting movement of the turret 21, since

the latter is held in its position by the upper die 15, which is still in the cylinder 22 at that time. However, when the ram 9 has completely withdrawn from the turret 21, a shifting movement of the turret 26 will also cause simultaneous shifting movement of the turret 21, since the latter is connected with the turret 26 by means of the detent plungers 37.

It will furthermore be clear that since the upper die 15 is connected with the ram 9 only by means of the detaining spring 17, the adherence of the upper die 15 to the slug causes the upper die 15 to disconnect itself from the ram 9 when the latter is retracted. When the slug is then ejected, the upper die is easily removed from the slug, and then re-inserted into the ram 9 if a slug of the same size is to be produced, or replaced by another die if a differently sized slug is to be made.

It will be understood that I desire to comprehend within my invention such modifications as come within the scope of the claims and the invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination in a press, a main cylinder, an auxiliary cylinder reciprocably mounted in said main cylinder and provided with a cylindrical extension, a press plunger reciprocably mounted in said auxiliary cylinder, a forming cylinder for receiving material to be briquetted, means for advancing said auxiliary cylinder toward said forming cylinder to cause said extension to form a substantially air tight chamber with said forming cylinder, means for creating a vacuum in said chamber for de-airing the material to be briquetted, and means for causing said plunger to exert a pressing action upon material in said forming cylinder.

2. In combination in a press, a main cylinder, an auxiliary cylinder reciprocably mounted in said main cylinder and being provided with an end chamber, a press plunger reciprocably mounted in said auxiliary cylinder, a molding cylinder for receiving material to be briquetted, means for advancing said auxiliary cylinder toward said molding cylinder to cause the said end chamber to form a substantially air tight chamber with said molding cylinder, means responsive to a predetermined pressure on said auxiliary cylinder for creating a vacuum in said air tight chamber, and means responsive to a predetermined pressure exerted on said auxiliary cylinder for initiating the advancement of said press plunger into said molding cylinder for briquetting the molding material therein.

3. In combination in a press, a molding chamber for receiving molding material, a reciprocable cylinder operable to form a vacuum chamber with said molding chamber, a press plunger reciprocably mounted in said reciprocable cylinder for compressing the molding material in said molding chamber, means for reciprocating said reciprocable cylinder and said press plunger in a predetermined sequence, and means responsive to a predetermined pressure on said press plunger for creating a vacuum in said vacuum chamber.

4. In combination in a press, a main cylinder, an auxiliary cylinder reciprocably mounted in said main cylinder and having associated therewith fluid operable advancing and retracting means, said auxiliary cylinder comprising a press cylinder and a hollow extension, a fluid operable press plunger reciprocable in said press cylinder and having a ram portion extending through said extension, a molding chamber in alignment with said auxiliary cylinder, means for advancing said auxiliary cylinder, toward said molding chamber to form a vacuum chamber therewith, means for advancing said press plunger to cause said ram to exert a molding pressure upon molding material in said molding chamber, pressure responsive means responsive to a predetermined pressure acting on said press plunger for creating a vacuum in said vacuum chamber to de-air the molding material in said molding chamber, and means for withdrawing the bottom from said molding chamber to allow ejection of the molded material.

5. In combination in a press, a press head, a press bed, an upper turret carrying a molding cylinder open at its ends, a lower turret rotatably mounted on said press bed and carrying a die member adapted to enter said molding cylinder and to close one end thereof, yielding means supporting said upper turret so as normally to cause said die member to extend into said molding cylinder, while spacing said turrets from each other, a press plunger reciprocably mounted in said press head for briquetting the material in said molding cylinder, said yielding means being adapted to allow said upper turret to rest on said lower turret in response to a predetermined pressure exerted upon said upper turret and conveyed thereto from said press plunger through the material in said molding cylinder, means responsive to a predetermined pressure on said press plunger for creating a vacuum in at least a portion of said molding cylinder to de-air the molding material in said molding cylinder, and means for spacing said two turrets to allow free shifting movement of said die member out of alignment with said molding cylinder to allow ejection of the molded material.

6. In combination in a press, a first turret comprising a molding cylinder open at its ends, a second turret movable relative to said first turret, a die member supported by said second turret and movable into alignment with said molding cylinder so as to partially extend into said molding cylinder to close the adjacent end thereof, a reciprocable press plunger adapted to enter said molding cylinder and to compress molding material therein, means for spacing said turrets from each other to allow withdrawal of said die member from said molding cylinder and also to allow angular shifting movement of said die member relative to said molding cylinder, and a lever operable sequentially to bring about the spacing of said turrets from each other and the angular shifting movement of said die member relative to said molding cylinder.

7. In combination in a press, a first turret comprising a molding cylinder open at its ends, a second turret movable relative to said first turret, a die member supported by said second turret and movable into alignment with said molding cylinder so as to partially extend into said molding cylinder to close the adjacent end thereof, a reciprocable press plunger adapted to enter said molding cylinder and to compress molding material therein, means for spacing said turrets from each other to allow withdrawal of said die member from said molding cylinder and also to allow angular shifting movement of said die member relative to said molding cylinder, a lever operable sequentially to bring about the spacing of said turrets from each other and the angular shifting

movement of said die member relative to said molding cylinder, and detaining means for selectively retaining said turrets in a predetermined relative position.

8. In combination in a press, a main cylinder having an auxiliary cylinder reciprocably mounted therein, a press plunger reciprocably mounted in said auxiliary cylinder, a molding cylinder for receiving material to be briquetted, means for advancing said auxiliary cylinder toward said molding cylinder for forming a substantially air tight chamber therewith, means operable subsequently to the said advancing movement of said auxiliary cylinder for causing advancing movement of said press plunger, means responsive to a predetermined pressure acting on said press plunger for connecting said air tight chamber with a vacuum producing means to de-air the molding material in said molding cylinder, a die member partially extending into said molding cylinder and closing one end thereof, shiftable means for supporting said die member, and means operable to subsequently space said die member from said molding cylinder and to shift said die member out of alignment with said molding cylinder to allow ejection of the molded material from said molding cylinder.

9. In combination in a press, a press bed, a first turret rotatably supported by said bed, said turret comprising a first bore of smaller diameter and a second bore of larger diameter, a die member mounted in said first bore, a second turret carrying a molding chamber open at its ends, said turrets being rotatable selectively relative to or in unison with each other, yielding means normally spacing said turrets from each other so that said die member partially extends into said molding chamber, a reciprocable press plunger to bring said turrets into engagement with each other and to compress molding material in said molding chamber, and means for subsequently withdrawing said die member from said second turret and shifting said second turret so as to bring said second bore into alignment with said molding chamber.

10. In combination in a press, a first turret comprising a central member and a plurality of molding cylinders detachably connected thereto for receiving material to be molded, said cylinders being open at their ends, a second turret comprising a plurality of first bores of smaller diameter and a plurality of second bores of larger diameter, a die member in each of said first bores, means for selectively aligning one of said dies or one of said second bores with one of said cylinders, said dies normally extending partially into said cylinders, and means for sequentially spacing said turrets from each other to withdraw said die member from the respective cylinder and bringing one of said second bores into alignment with said last mentioned cylinder to allow ejection of molded material from said cylinder through said bore.

11. In combination in a press, a molding cylinder for receiving material to be briquetted, a main cylinder, a fluid operable auxiliary cylinder reciprocable in said main cylinder and movable into contact with said molding cylinder to form a vacuum chamber therewith, a fluid operable press plunger reciprocable in said auxiliary cylinder for briquetting the material in said molding cylinder, and fluid pressure responsive means hydraulically connected with said press plunger for preventing advancing movement of the latter prior to the initiation of the advancing movement of said fluid operable auxiliary cylinder.

12. In combination in a press, a molding cylinder for receiving material to be briquetted, said cylinder being open at its ends, a pressing plunger operable to enter said molding cylinder for exerting pressure on the material to be briquetted, die means slidably extending into said cylinder to close one end thereof, a shiftable support for said die means, actuating means associated with said support for withdrawing said die means from said cylinder, and lever means shiftable in a slot in said support and connected with said actuating means, said lever means being adapted in response to its movement within said slot to operate said actuating means for withdrawing said die means from said cylinder, and also being adapted, when moved while engaging one end of said slot, to angularly shift said support.

13. In combination in a molding press, a molding chamber for receiving molding material, a reciprocable cylinder operable to form a vacuum chamber with said molding chamber, a press plunger reciprocably mounted in said reciprocable cylinder for compressing the molding material in said molding chamber, a die member supported by said plunger, yielding means detachably connecting said die member with said plunger, means for reciprocating said reciprocable cylinder and said press plunger in a predetermined sequence, and means responsive to a predetermined pressure on said plunger for creating a vacuum in said vacuum chamber.

14. In combination in a press, a first turret comprising a molding cylinder open at its ends, a second turret movable relative to said first turret, a first die member supported by said second turret and movable into alignment with said molding cylinder so as to partially extend into said molding cylinder to close the adjacent end thereof, a reciprocable press plunger having detachably connected thereto a second die member adapted to enter said molding cylinder and to compress molding material therein, yielding means detachably connecting said second die member with said plunger, spacing means operable to space said turrets from each other to allow withdrawal of said first die member from said molding cylinder and also to allow angular shifting movement of said first die member relative to said molding cylinder, and a lever operable sequentially to actuate said spacing means and to bring about the angular shifting movement of said first die member relative to said molding cylinder.

15. In combination in a press, a first turret comprising a molding cylinder open at its ends, a second turret movable relative to said first turret, a first die member supported by said second turret and movable into alignment with said molding cylinder so as to partially extend into said molding cylinder to close the adjacent end thereof, a reciprocable press plunger, said press plunger having a recess at one end thereof with a groove, a second die member having an annular groove and extending into said plunger, yieldable detaining means engaging the groove in said plunger and the groove of said second die member for connecting the latter to said plunger, said second die member being adapted to enter said molding cylinder and to compress molding material therein, spacing means operable to space said turrets from each other to allow withdrawal of said first die member from said molding cylinder and also to allow angular shifting move-

ment of said first die member relative to said molding cylinder, and lever means operable to sequentially actuate said spacing means and to bring about the angular shifting movement of said first die member relative to said molding cylinder.

16. In combination in a press, a first turret comprising a molding cylinder open at its ends, a second turret movable relative to said first turret, a first die member supported by said second turret and movable into alignment with said molding cylinder so as to partially extend into said molding cylinder to close the adjacent end thereof, a reciprocable press plunger, a second die member detachably connected to said plunger and operable thereby for compressing molding material in said molding cylinder, spacing means operable to space said turrets from each other to allow withdrawal of said first die member from said molding cylinder and also to allow angular shifting movement of said first die member relative to said molding cylinder, lever means operable to actuate said spacing means and to bring about the angular shifting movement of said first die member relative to said molding cylinder, and means responsive to a predetermined adhesion of said second die member to said molding material during the movement of said plunger away from said molding cylinder for causing said second die member to disengage said plunger.

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