

Mar. 20, 1923.

1,448,982

J. TREADWELL

BRIQUETTE PRESS

Filed Sept. 13, 1921

2 sheets-sheet 1

Fig. 1

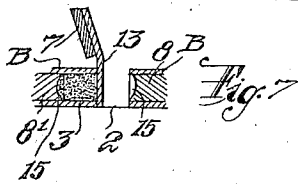
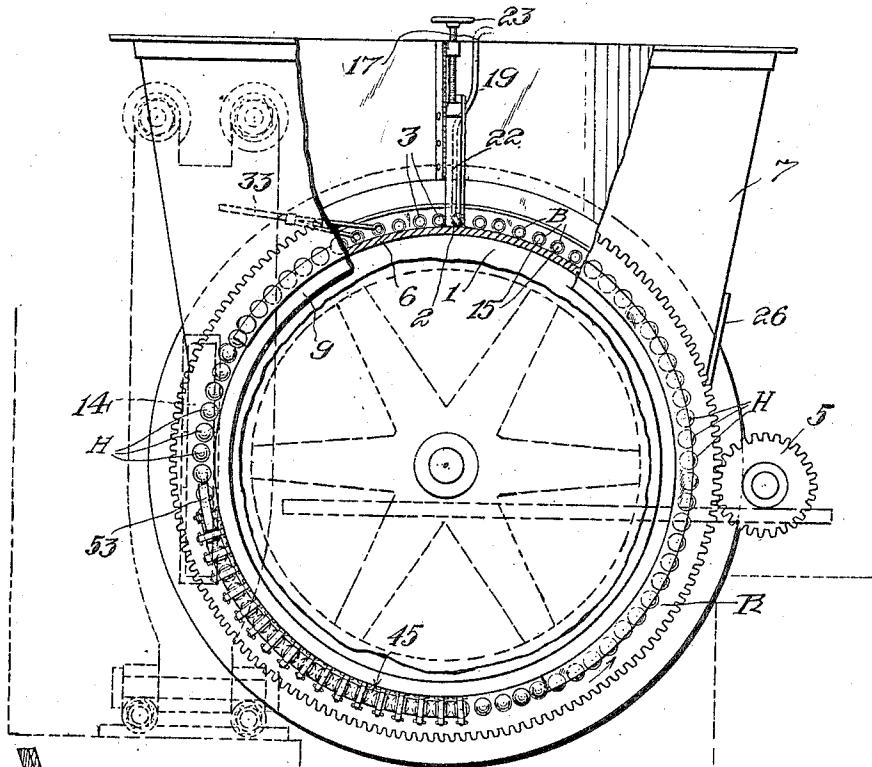
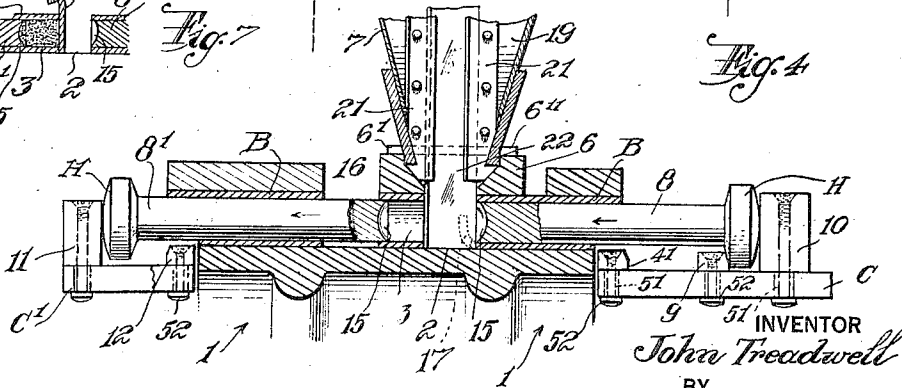


Fig. 4



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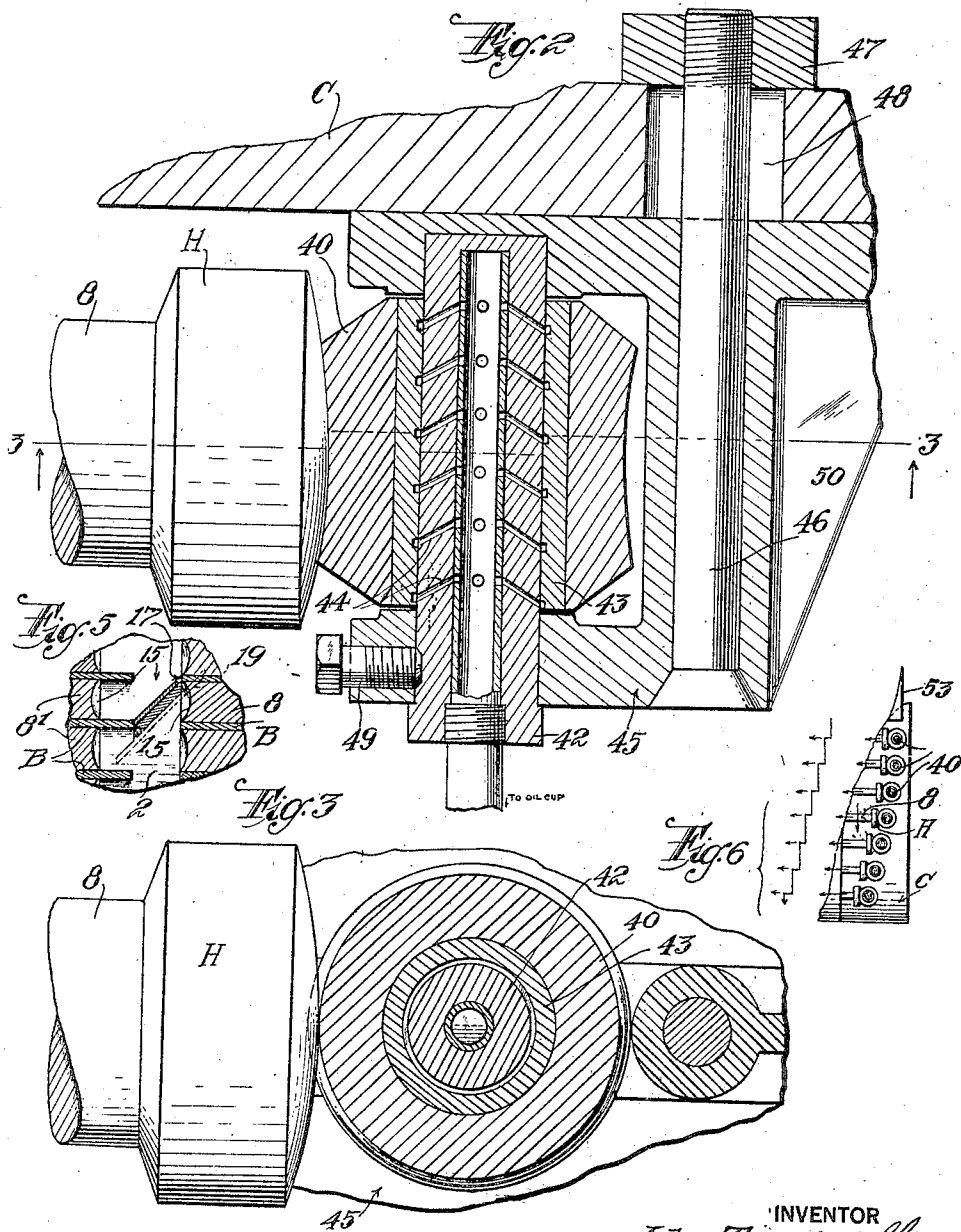
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UNITED STATES PATENT OFFICE.

JOHN TREADWELL, OF NEW YORK, N. Y.

BRIQUETTE PRESS.

Application filed September 13, 1921. Serial No. 500,342.

To all whom it may concern:

Be it known that I, JOHN TREADWELL, a citizen of the United States, residing at New York, N. Y., have invented certain new and useful Improvements in Briquette Presses, of which the following is a specification.

This invention relates to briquette presses and it constitutes an improvement and refinement over the briquette press forming the subject matter of my Patent Number 784,083, issued March 7, 1905.

The object of the invention is to improve the action of the press of said patent by causing the material to be moulded to be positively fed from the feed groove into the moulding chamber so that it will be pressed into moulding position more uniformly, compactly and completely.

I have selected one embodiment of my invention for the purpose of illustrating and describing it but it is to be understood that it is used only in an illustrative sense instead of a limiting one, for obviously, my invention is capable of a number of different embodiments without departing from its spirit and scope.

The chosen embodiment is shown in the accompanying drawings in which—

Figure 1 is a partly diagrammatic side elevation of my improved device with parts broken away and this view is comparable to the view shown in Fig. 1 of said patent;

Fig. 2 is a vertical sectional view through one of the rollers for engaging the moulding plungers or pins;

Fig. 3 is a horizontal sectional view taken along the lines 3—3 in Fig. 2;

Fig. 4 is a cross sectional view taken through the hopper and the wheel rim just forward of the feeder;

Fig. 5 is a plan view of the feeder in the feed groove between two coacting moulding plungers or pins. Figs. 6 and 7 show details.

The device is composed of a rotary wheel 1 provided on its exterior periphery with a feed groove 2, and a discharge groove 16, the groove 2 being between ribs 6 and 6' with the groove 16 running parallel to the groove 2 and having the rib 6' between the two grooves. In the rib 6' are transverse openings or moulding chambers or moulds 3, of which there are a series extending entirely around the wheel 1 and except beneath the feed hopper 7, these ribs are bridged over

with a circular guard 6". A slot is provided at the bottom of the circular guard 6" through which any material may drop which may possibly pass the feeder. On each side of the wheel 1, carried by it and working in pairs across its rim, are pistons, plungers, or pins 8 and 8' having rounded heads H. These are controlled by stationary drum sections C and C' placed adjacent to the rim of the wheel and which bear against the heads H of the plungers. The wheel 1 is rotated by means of a gear ring R mounted on the wheel 1 and driven from any suitable source of power by gear 5.

The material to be acted upon by this device is generally pulverized coal having mixed therewith a suitable binder but any other such plastic or mouldable medium may be operated upon by the machine, the only requirement being that although feeding readily it is capable of compression into a solid form. The material to be moulded is placed in the hopper 7 and in order to insure a positive feed of the material to the moulds 3, I provide across the hopper 7 a partition or bulkhead 19, having guides 21 thereon, in which is mounted a feeder 22, adjustable toward and away from the bottom of the groove 2 by means such as a screw 23. This feeder projects down through the open bottom of the hopper and into the feed groove 2 and the feeder is inclined in a vertical plane to extend diagonally across the groove 2.

The material delivered from the hopper 7 falls through its open bottom in advance of the feeder 22 so that the mass of material entering the feed groove 2 is carried forward against the feeder 22 by the motion of the wheel and as the feeder substantially fills the width of the feed groove 2 and is inclined across the groove, such material is compelled by the feeder to enter the open moulds 3. In order to keep the cupped portion 15 of the plunger 8 free from the materials, I provide any suitable fluid jet means 17 in the corner of the feeder 22, adjacent to said cupped portion whereby the jet can blow said cupped portion clean of the material, and this jet helps or assists to force the loosened material across the feed groove into the pockets 15 of the plungers 8'. Except for these means, some material would stick in said cupped portion with the result that some briquettes would have more material in them than others, and one aim of

this machine is to produce briquettes absolutely uniform in size and weight.

The feeder 22 being located diagonally in the feed groove 2 presses the material to be moulded into the mould 3, leaving the groove substantially clean and the jet means 17 insures the cupped portion on the plunger 8 being clean of any of the material. The plungers 8 on one side of the wheel are next caused to be pushed inwardly across the feed groove 2 into the moulds 3 and to hold the material therein, the pair of plungers 8 and 8' keeping the opposite ends of the moulds closed or rather forming the ends of the mould; thirdly, the plungers compress the material in the moulds and form the briquette; fourthly, one of the pair of plungers (8') is retracted and the other (8) further advanced to push the completed briquette out of the mould to discharge it through the open or discharge groove 16. The second and fourth operations are caused by the drum sections' cams 9, 10, 11 and 12; but the third step, which forms the briquette, is produced by a pair of plunger-pressing rolls such as 14, between which the plungers pass in contact. These rolls force the successive plungers toward each other and form a briquette at each instant when a pair of plungers passes the rollers. The pressing ends 15, of the plungers are cup-shaped, producing a briquette which is cylindrical, formed by the mould 3, but having convex ends, formed by the concave ends 15 of the plungers.

Any means 26 is provided on the front of the hopper 7 to prevent the material therein from dropping out through the feed groove 2.

The plungers 8 and 8' are preferably surrounded by bushings B for the purpose of taking up wear. To prevent the adhesion to the plungers 8 of the plastic material to be moulded, I provide a lubricating oil spray 33 therefor located in the feed groove 2 back of the feeder 22 so that prior to the pressing or moulding operation, the plunger 8 and its cupped portion 15 will be lubricated. The lubricant on the plunger 8 tends also to keep the mould 3 lubricated when the plunger passes therethrough for the purpose of discharging the briquette.

After the plungers have been pressed inwardly for the moulding operation by the pressing rolls 14, it becomes necessary to move the briquette out of the moulding chamber 3 into the discharge groove 16 so that the finished briquette may be delivered from the machine so to that end, the cam 10 is replaced by a plurality of rollers 40 set on a curved line to jerkily engage the heads H of the plungers 8 to loosen the briquette in its moulding chamber 3 and successively expel it therefrom, the path of movement of the plungers 8 being substantially that of

the line forming the left half of Fig. 6. Pressure inwardly on the plunger 8 by the rollers 40, causes it to be pushed inwardly which is communicated to the briquette and the plunger 8' and this continues until the plunger 8' has been pushed outwardly past the discharge groove 16, leaving the briquette free to fall out from the machine through the groove 16. The rib 41 on the part C acts as a limit for the inward movement of the plungers 8.

The rollers 40 are journalled on hollow shafts 42 and are provided with bushings 43, and the hollow shaft 42 has a lubricant feed to it from any suitable source such as an oil cup and this lubricant passes to the roller bushing 43 through oil grooves or ducts 44. The shafts 42 are secured in position by means of a casting or other suitable support 45, adjustably fastened to the drum section C by means of bolts 46 and nuts 47. The space 48 is provided for adjusting the support 45 with respect to the part C and the set screw 49 is provided to secure the shaft 42 within the support 45. The support is preferably strengthened by means of the webs 50.

The periphery of the roller 40 is curved to be complementary with the curvature of the head H of the plungers 8.

The cam-ribs 9, 10, 11, and 12 are preferably bolted on to the stationary cam-sections *c* and *c'* with spaces 51 left on each side of the bolts 52 in the drum sections C and C' so that the ribs may be adjusted with respect to the stationary sections.

After being acted upon by the pressing rolls 14 and just before being acted upon by the rollers 42, the heads of the plungers 8 engage a guide 53 to start them on their inward travel before the rollers 42 get to act on them.

Depending from the hopper wall 7 beginning close back of the feeder 22 is a plate 13 having one edge curved to be complementary to the periphery of the wheel 1 and projecting down to the bottom of the feed groove 2 to form a closure for the open end of the filled moulds 3 to prevent the material falling therefrom prior to the time the plunger crosses the feed groove for the pressing operation.

It will thus be seen that I have devised a very simple and efficient briquette press, one which will deliver briquettes absolutely uniform in size and weight as well as without defacement, and one which due to the novel treatment of the plungers during their expelling movement, will discharge the briquettes positively without having a part thereof left sticking to the plungers or in the mould.

What I claim is:

1. In a briquette press, a hopper, a wheel having a feed groove, moulding chambers 130

- adjacent said groove, a pair of plungers co-acting with each of said moulding chambers with one of said plungers adapted to cross said groove, and feeding means extending 5 into said groove from said hopper adapted to press the material in said feed groove to be moulded into said moulding chambers.
2. The apparatus of claim 1 in which the feeding means extends diagonally across 10 said groove.
3. The apparatus of claim 1 in which a bulkhead is provided in said hopper adapted to support said feeding means which means extends diagonally across said groove.
- 15 4. The apparatus of claim 1 with the addition of plunger-cleaning means associated with said feeding means.
5. The apparatus of claim 1 with the addition of fluid jet plunger-cleaning means 20 associated with said feeding means.
6. The apparatus of claim 1 with the addition of fluid jet means for cleaning the plunger which is adapted to cross said groove.
- 25 7. The apparatus of claim 1 with the addition of means for applying lubricant to the plunger adapted to bridge said groove prior to the coaction of the plunger with the moulding chamber.
- 30 8. The apparatus of claim 1 with the addition of means in the feed groove for applying lubricant to said plunger adapted to cross the feed groove.
- 35 9. In a briquette press, a wheel having a feed groove, and a discharge groove, a moulding chamber adjacent said feed groove, means for feeding material to be moulded from said feed groove into said chambers, a pair of plungers coacting with each said 40 moulding chamber to mould the material therein, and a string of relatively small roller means for moving said plungers to convey the briquette from the moulding chamber to the discharge groove.
10. The apparatus of claim 9 with the 45 addition of a stationary drum adjacent to said wheel, the roller means being mounted on said drum.
11. The apparatus of claim 9 with the addition of a stationary drum adjacent to 50 said wheel, and means for adjustably mounting said roller means on said drum.
12. The apparatus of claim 9, in which said roller means are set on a curved line.
13. The apparatus of claim 9 with the 55 addition of a stationary drum adjacent to said wheel, and a support carried by said drum with the roller means included in said support.
14. The apparatus of claim 9 with the 60 addition of starting means for said plungers in advance of said roller means.
15. The apparatus of claim 1 with the addition of means for preventing material 65 from falling from said moulding chambers prior to the co-action therewith of the plungers.
16. The apparatus of claim 1 with the addition of a plate having a curved edge for preventing material from falling from 70 said moulding chambers prior to the co-action therewith of the plungers.
17. The apparatus of claim 1 with the addition of a circular guard extending 75 around said groove and exit means for permitting any material remaining in the grooves to pass out said exit in the guide.
- In testimony whereof I have affixed my signature to this specification.
- JOHN TREADWELL.