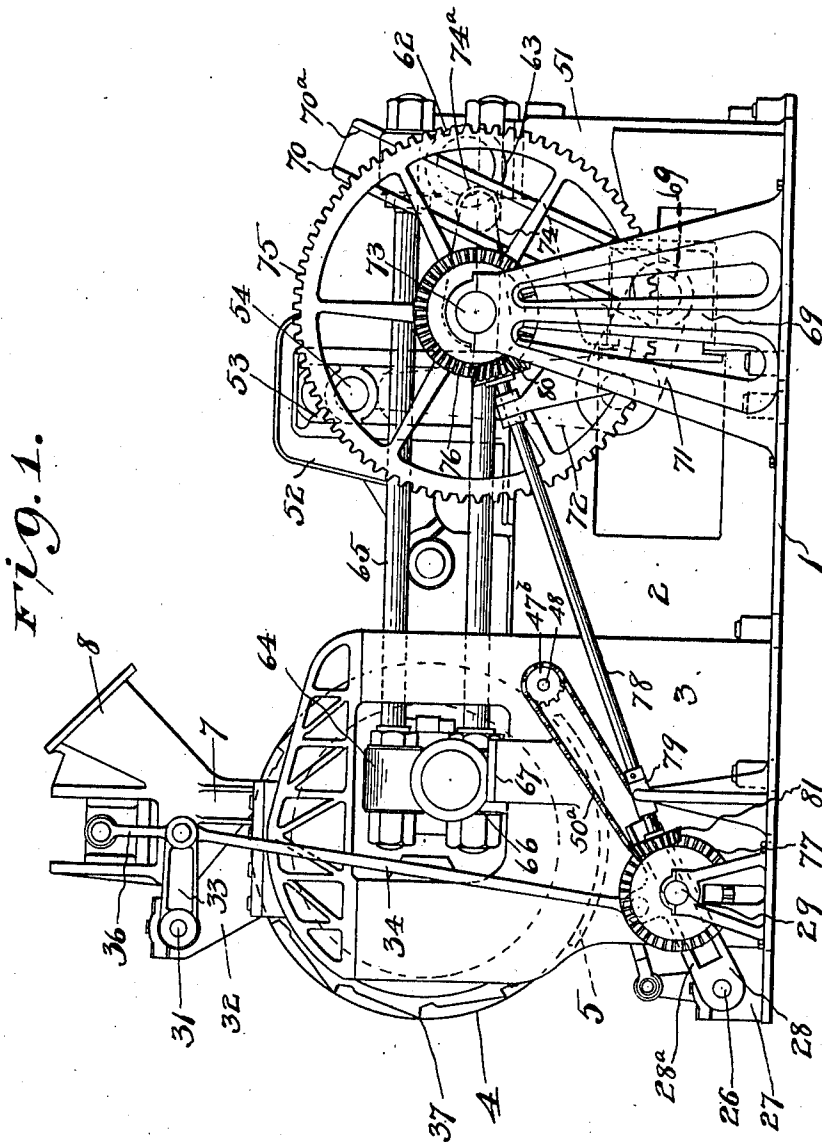


J. W. PETERS & D. I. BROWN.
BRIQUET MACHINE.
APPLICATION FILED SEPT. 28, 1908.

970,546.

Patented Sept. 20, 1910.
8 SHEETS—SHEET 1.



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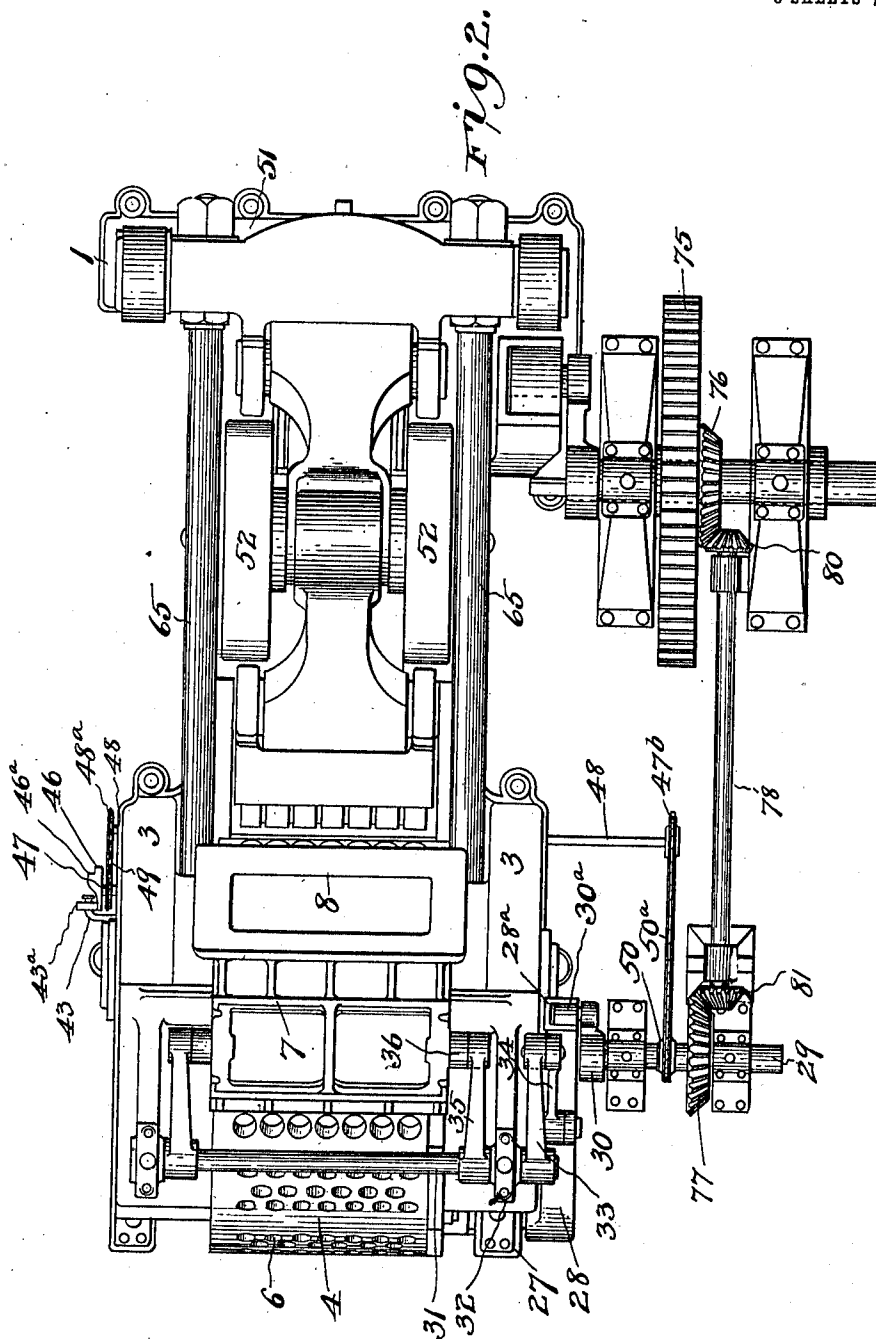
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8 SHEETS-SHEET 2.



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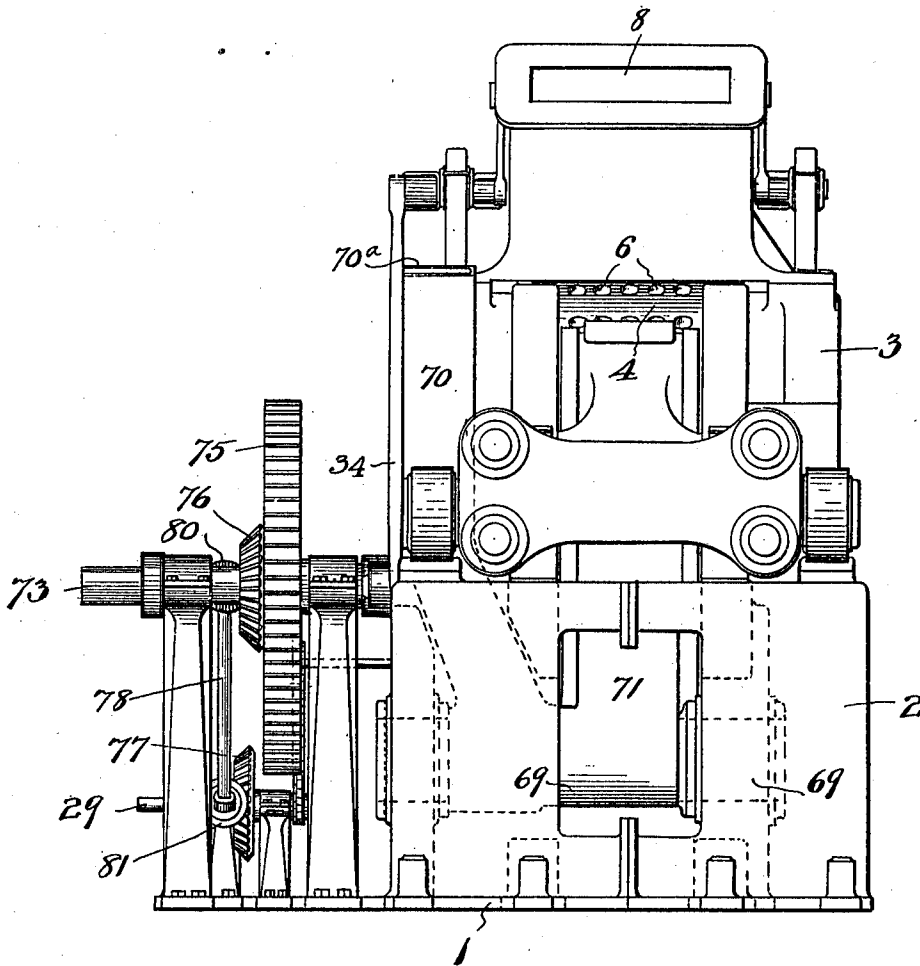
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8 SHEETS-SHEET 3.

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Fig. 3.



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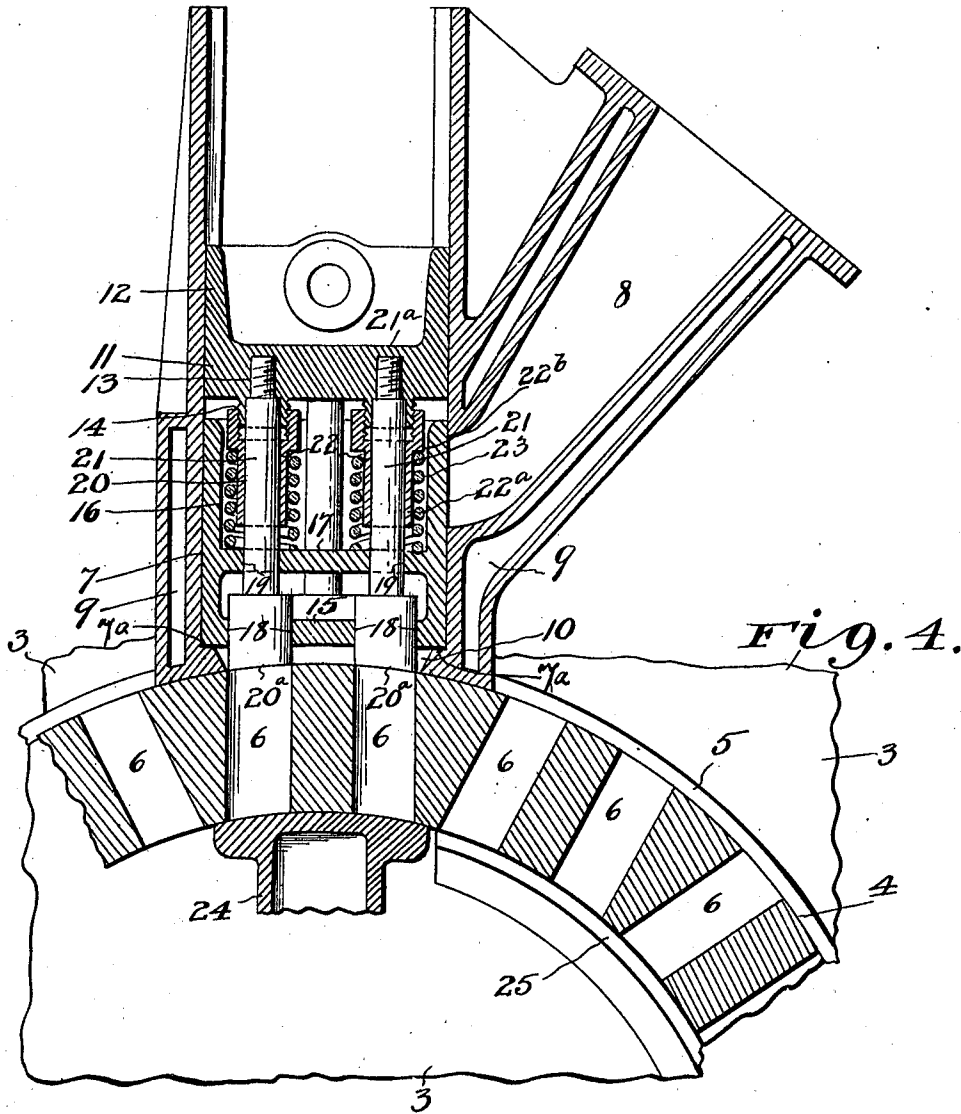
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APPLICATION FILED SEPT. 28, 1908.

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8 SHEETS—SHEET 4.

970,546.



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Patented Sept. 20, 1910.

8 SHEETS—SHEET 5.

Fig. 5.

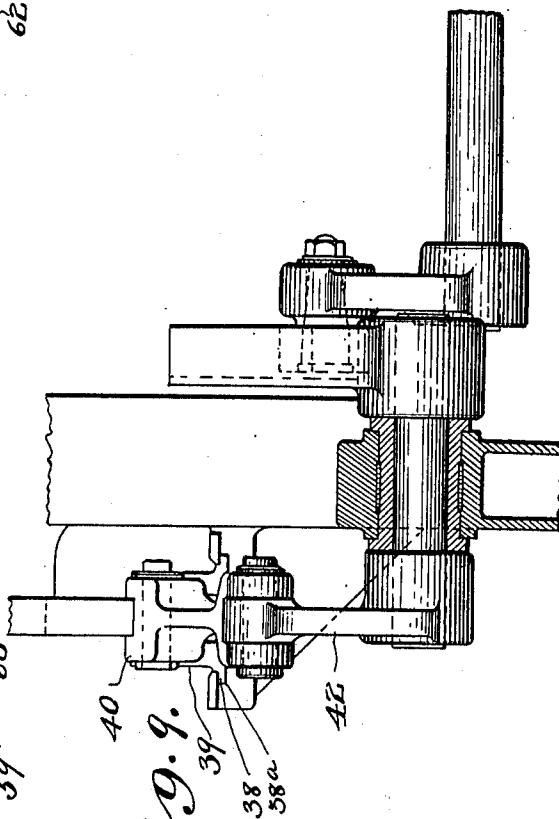
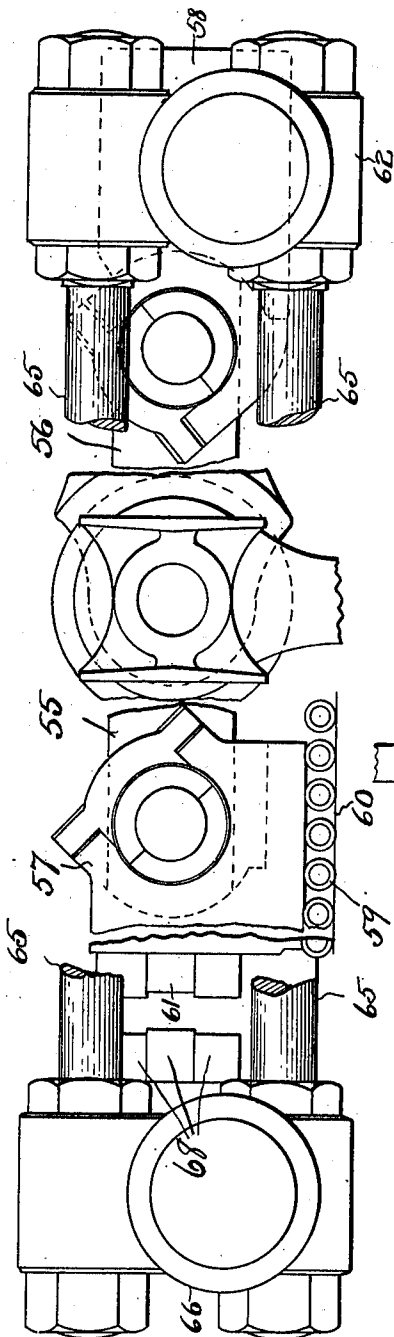


Fig. 9.

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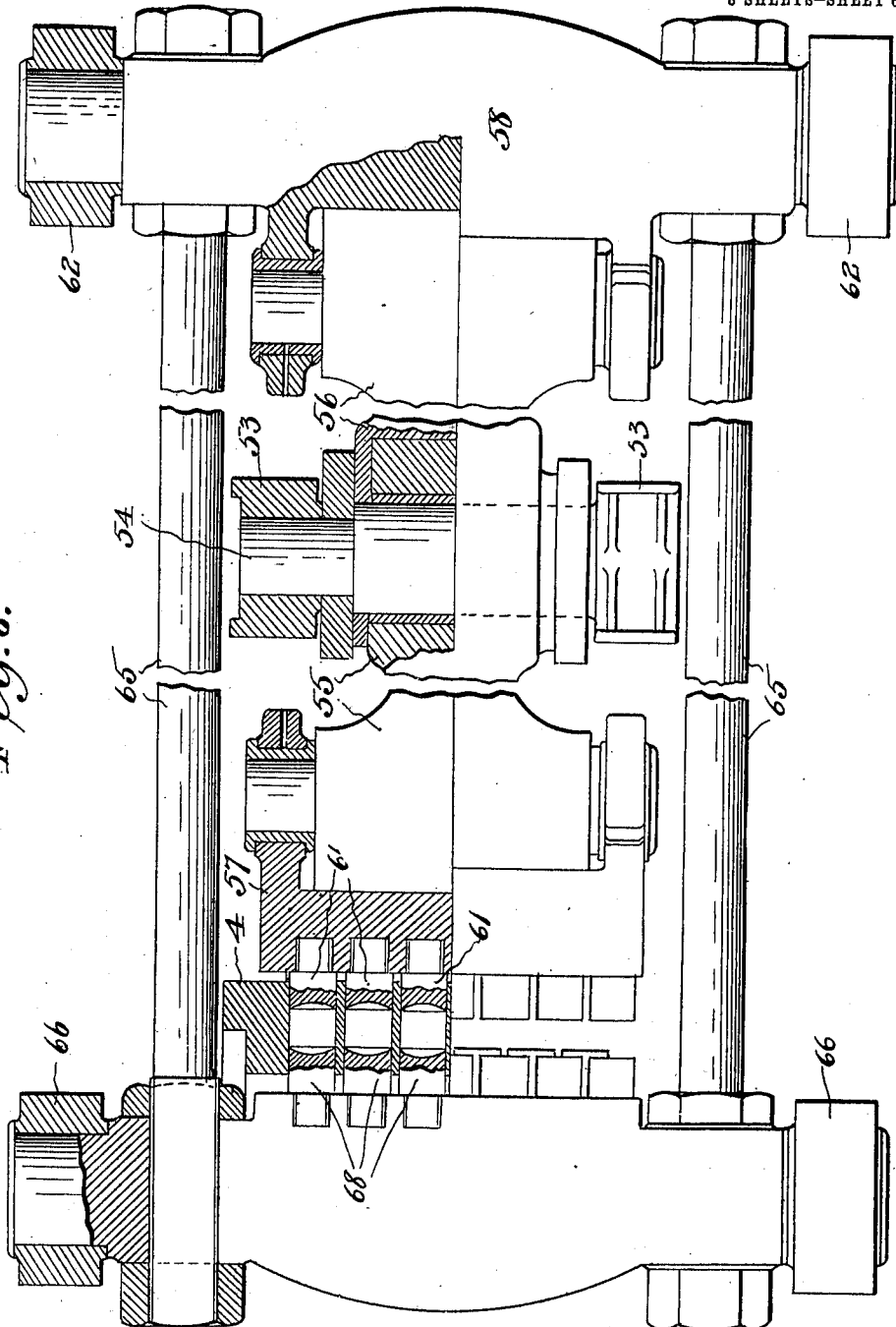
APPLICATION FILED SEPT. 28, 1908.

Patented Sept. 20, 1910.

8 SHEETS—SHEET 6.

970,546.

Fig. 6.



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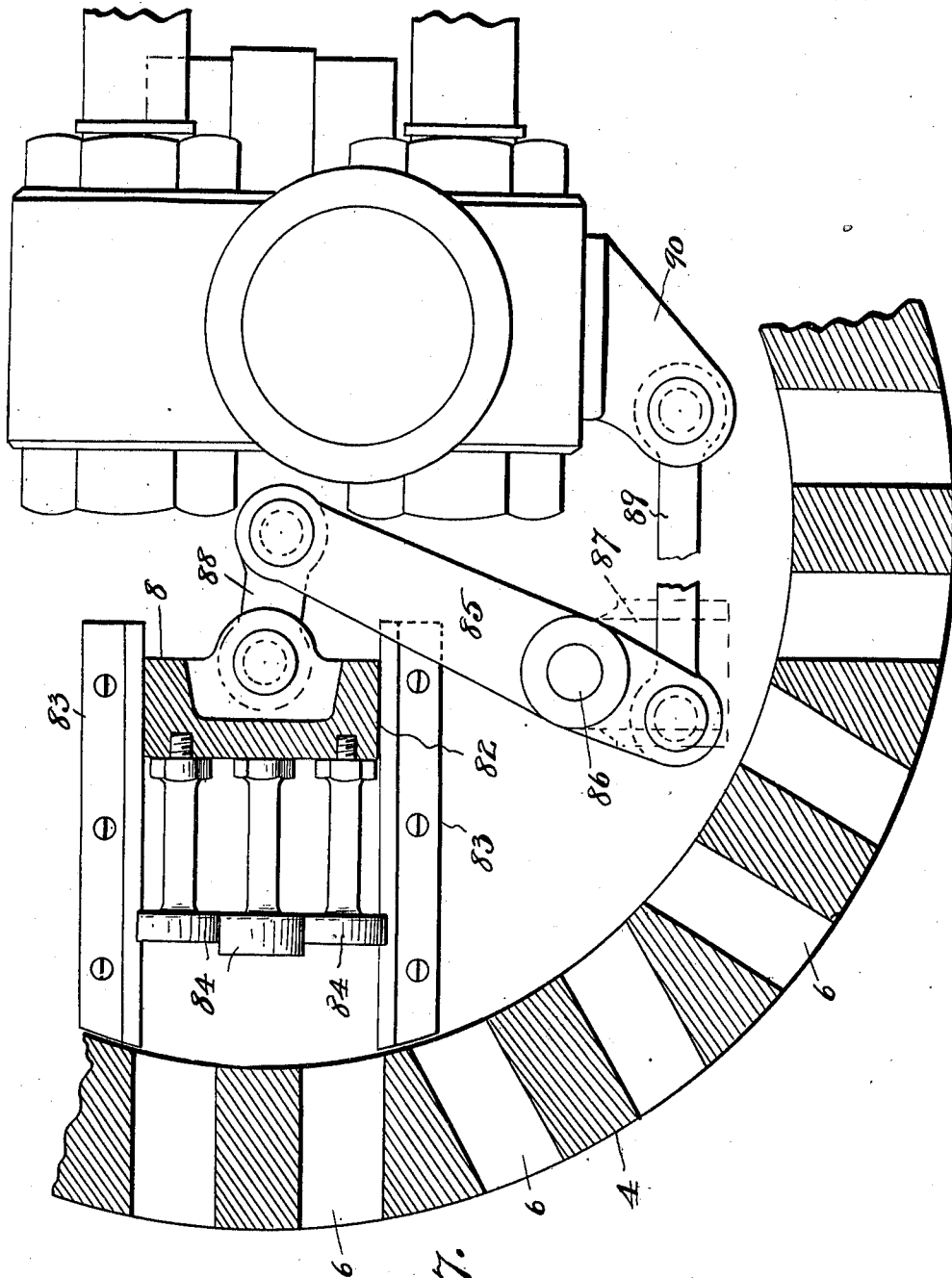
BRIQUET MACHINE.

APPLICATION FILED SEPT. 28, 1908.

970,546.

Patented Sept. 20, 1910.

8 SHEETS—SHEET 7.



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Fig. 7.

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APPLICATION FILED SEPT. 28, 1908.

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Patented Sept. 20, 1910.

8 SHEETS—SHEET 8.

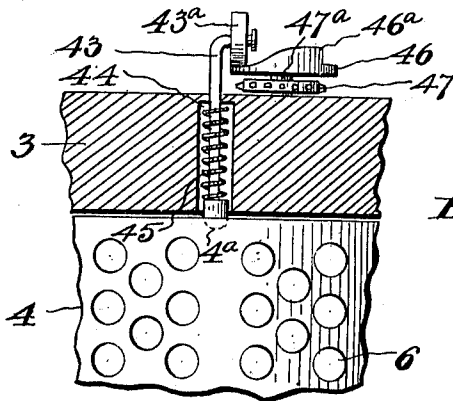
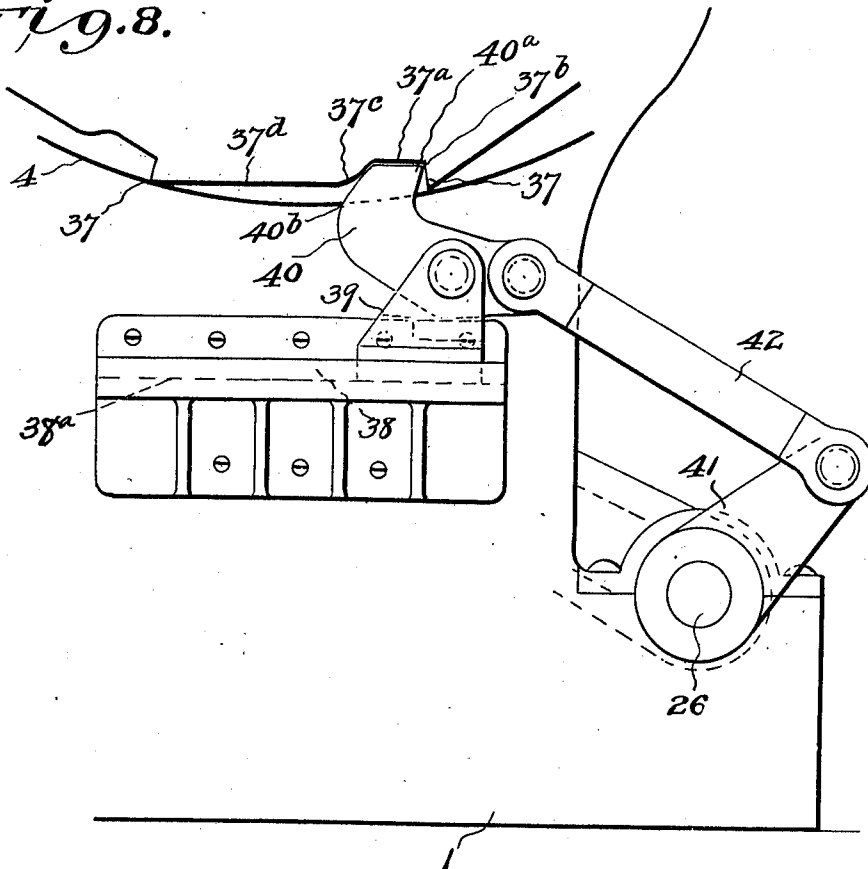


Fig. 10.

Fig. 8.



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UNITED STATES PATENT OFFICE.

JOSEPH W. PETERS AND DAVID IVES BROWN, OF PITTSBURG, PENNSYLVANIA.

BRIQUET-MACHINE.

970,546.

Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed September 28, 1908. Serial No. 455,000.

To all whom it may concern:

Be it known that we, JOSEPH W. PETERS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, and DAVID IVES BROWN, of the same place, citizens of the United States, have invented certain new and useful Improvements in Briquet-Machines, of which the following is a specification.

Our invention relates to machines for compressing comminuted material such as culm, lignite and other waste fuel products into briquets and has for its object the improvement of machines of this character looking to a more rapid, efficient and economical operation, and consists in providing a revolving cylindrical table with a series of groups of molds therein and providing mechanism by which the table is given a step by step motion so as to bring each group of molds successively into position to be filled with the material and have it slightly compressed therein, then moved to another position where the material is submitted to great pressure to form it into blocks or briquets and finally moved to a position where the briquets are removed from the molds.

Our invention will be described in detail hereinafter and illustrated in the accompanying drawings in which—

Figure 1 is a side view in elevation of our improved briquet machine, Fig. 2, a top plan view, Fig. 3, an end view, Fig. 4, a detail view of the filling device and mechanism for giving the initial compression to the briquet material, Fig. 5, a side view of the mechanism to give the material its final compression, Fig. 6, a top plan view of the mechanism shown in Fig. 5, Fig. 7, a detail view of the mechanism for ejecting the briquets, Figs. 8 and 9, detail views of the mechanism for revolving the drum, and Fig. 10, a detail view of the mechanism for locking the drum.

In the drawings similar reference characters will indicate corresponding parts in all of the views.

1 indicates the base of our improved machine having the casing 2 mounted thereon. At one end the casing 2 is formed with two upright portions 3 having a cylindrical table or drum 4 revolubly mounted therebetween on bearings 5 secured to the adjacent sides of said uprights 3, said table being provided

with a series of groups of holes 6 therein arranged at equal intervals around it and forming molds for forming the briquets by the mechanism to be hereinafter described.

Secured to the top of upright portions 3 is a filler-box 7 having a hopper 8 delivering thereto through which the material is fed to the box 7, said box 7 and hopper 8 being inclosed by double thick walls spaced apart to form a chamber 9 to hold steam to heat the box and hopper. The delivery orifice 10 of filler-box 7 is just large enough to uncover a single group of holes or molds 6 above described.

11 indicates a plunger block slidably mounted in box 7 having an upwardly extending flange 12 around its edge to engage the inner surface of the box. The lower surface of block 11 is provided with threaded sockets 13 in alinement with the holes in each group 6 under orifice 10 said sockets being surrounded by annular exteriorly threaded bosses 14.

15 indicates the pressure plate having an upwardly extending flange 16 around its edge and a horizontal web 17 formed integral with flange 16 and spaced apart from pressure plate 15. Plate 15 is provided with a plurality of holes 18 of substantially the same size as the holes in groups 6 and in alinement therewith while the web 17 is provided with holes 19 smaller in diameter than holes 18 but centrally alined therewith.

20 indicates plungers having heads 20^a mounted in holes 18 and stems 21 extending through holes 19 and formed with threaded ends 21^a that fit in threaded sockets 13.

22 indicates sleeves secured to threaded bosses 14 having their lower ends reduced in diameter as shown at 22^a to snugly fit stems 21^a of the plungers 20 and forming an exterior annular shoulder 22^b on the sleeve.

23 indicates a coil spring mounted on each sleeve 22 and engaging shoulder 22^b thereon and web 17.

It will be understood from this description that when block 11 is raised by the instrumentality hereinafter described that the plungers 20 will also be raised and when their heads 20^a engage web 17 the pressure plate 15 will be raised, this motion being continued until the delivery orifice of hopper 8 is uncovered by flange 16. The prod-

uct will then pour from hopper 8 into filler-box 7 and from filler-box 7 into the molds 6 until the block 11 is forced downwardly, when the springs 23 will hold the web 17 in engagement with the heads 20^a of plungers 20 so as to cut off the feed from hopper 8 in advance of the block, and the lower surface of plate 15 being substantially on the same plane as the bottoms of plungers 20 the material in the filler-box and molds 6 will be lightly compacted in advance thereof. When the lower surface of the plate 15 engages shoulder 7^a in filler-box 7 the plate and flange 16 and web 17 are halted so that the flange 16 remains in position covering the orifice of hopper 8, but the continued descent of the block 11 forces the plungers 20 downwardly through the plate 15 and still further compacts the material in advance of said plungers in molds 6. The operation just described is then repeated, the drum 3 being rotated by the mechanism hereinafter described so that the next succeeding group of holes or molds 6 are brought into position under the filler-box 7.

24 indicates a table secured to uprights 3 and positioned under filler-box 7 to cover the inner ends of molds 6 while being filled as above described and 25 a segmental plate secured to said uprights and extending from table 24 to the repress mechanism to be hereinafter described to hold the compressed material in the molds after leaving the table and before reaching the repress mechanism referred to.

26 indicates a shaft journaled in bearings 27 mounted on base 1 and 28 a slotted arm secured to said shaft, said arm and shaft being actuated by a drive shaft 29 journaled as shown and having a crank arm 30 secured thereto with a roller or shoe 30^a loosely secured thereon that engages the slot 28^a in the arm, it being understood that the rotation of shaft 29 and crank arm 30 imparts a rocking motion to the arm and shaft 26.

31 indicates another shaft journaled on supports 32 secured to the top of uprights 3, and 33 an arm secured to shaft 31 and connected to arm 28 by means of pitman 34. 35 indicates other arms secured to shaft 31 at each end of filler-box 7 and 36 links connecting arms 35 and the end flanges of block 11.

It will be understood from this construction that when shaft 26 is rocked a rocking motion is imparted to shaft 31 through arms 28 and 33 and pitman 34, and to block 11 and its connections above described by means of arms 35 and links 36 to raise and lower the pressure plate 15 and plungers 20.

37 indicates ratchet teeth formed in the outer surface of drum 4 there being as many teeth 37 in the drum as there are groups of

molds 6 formed therein, each of said teeth comprising a notch 37^a having the engaging end 37^b formed at substantially a right angle to the base thereof, and radially of the drum, and its rear end curved backwardly from the notch as shown at 37^c and merging into the inclined surface 37^d that ends at the next succeeding notch 37.

38 indicates a bearing plate secured to one of the uprights 3 and having a guide slot 38^a in its upper face to support a block 39 slidably mounted thereon.

40 indicates a hook or claw pivotally secured to block 39 and adapted to engage ratchet teeth 37, said hook or claw having its engaging end formed with an engaging point 40^a on its inner or forward side and a curved rear edge 40^b that engages the curved portion 37^c when the block 39 reaches the extremity of its forward stroke to stop the motion of the drum 4 and also to throw the claw out of engagement with notch 37^a preparatory to a reverse movement to engage the next tooth.

41 indicates an arm secured to shaft 26 and 42 a link connecting arm 41 and claw or hook 40, said arm 41 being so positioned on the shaft 26 that when the block 11, above-described, is in its lowermost position and the plungers 20 are compressing the material in molds 6 the claw 40 is at the extremity of its backward stroke, and ready to engage a tooth 37, so that when the block 11 starts upwardly the claw is swung into engagement with the notch 37^a and the drum is rotated the distance of the length of the tooth so as to bring the next group of molds under orifice 10.

43 indicates a pin slidably mounted in hole 44 in upright 3 and normally propelled by spring 45 so as to engage the end of drum 4 or seat in one of the sockets 4^a therein.

43^a indicates a roller on the end of pin 43, 46 a disk having a cam projection 46^a positioned so as to engage roller 43^a and 47 a sprocket wheel secured to the disk 46, said disk and sprocket wheel being journaled on a stud shaft 47^a secured to one of the uprights 3.

48 indicates a shaft journaled in uprights 3, 48^a a sprocket wheel on one end geared to sprocket wheel 47 by means of chain 49, and a sprocket wheel 47^b on its other end geared to sprocket wheel 50, keyed to shaft 29, by means of chain 50^a.

After leaving the initial press as above described the drum 4 is rotated so that each set of molds 6 is held in position to be repressed by the mechanism to be described now.

51 indicates the casing at the rear of the machine having the guides 52 secured to its top with the blocks 53 slidably mounted therein and connected by shaft 54.

55 and 56 indicate arms journaled on shaft 54, the free ends of said arms being pivotally secured to plunger block 57 and cross head 58 respectively. Block 57 is mounted by means of rollers 59 on bearing 60 secured to casing 51 and has plungers 61 secured thereto in alinement with the outer side of a group of molds 6 when the drum 4 is at rest. Cross head 58 is mounted on rollers 62 that bears on supports 63 adjacent to the rear end of casing 51 and are connected to plunger block 64 inside of the drum 4 by means of bars 65. Block 64 is mounted on rollers 66 that rest on supports 67 secured to uprights 3 and has secured thereto plungers 68 in alinement with the inner side of the group of molds 6 and opposite to plunger 61.

69 indicates a shaft journaled in casing 51 having an arm 70 secured thereto provided with a slot 70^a and another arm 71 also secured thereto.

72 indicates a link pivotally secured to arm 71 and having its free end bifurcated and pivotally secured to shaft 54 on each side of arms 55 and 56.

73 indicates a drive shaft suitably journaled and having crank arm 74 extending therefrom with a shoe 74^a that rides in slot 70^a.

It will be understood that during each complete rotation of shaft 73 the arm 70 is rocked so as to draw the shaft 54 downward pushing the plungers 61 and 68 toward each other, to compress the material in molds 6 into solid cakes or briquets, and then returned to their normal position, the compression being slow while the withdrawal of the plungers is made more quickly. Shaft 73 is actuated by means of gear wheel 75 keyed thereto and actuated by any suitable motor (not shown) to give the shaft a continuous rotation.

76 indicates a beveled gear wheel also keyed to shaft 73, 77 a beveled gear wheel keyed to shaft 29, and 78 a shaft journaled in boxes 79 and having beveled pinions 80 and 81 geared to beveled gear wheels 76 and 77 respectively so as to actuate said shaft 29.

The briquets are removed from the molds 6 by means of a block 82 slidably mounted in guides 83 secured to uprights 3 and having plungers 84 secured thereto to engage the briquets and push them out of the molds. The guides 83 are on the opposite side of uprights 3 from the position of the repress mechanism, the block 82 being operated by a lever 85 secured to an axle 86 journaled in bearings 87 secured to uprights 3, the upper arm of said lever being connected to block 82 by means of link 88 while its lower arm is connected to block 64 by means of a link 89 mounted in bearings 90 secured to said block.

It will be understood that when block 64 is moved so as to compress the material in the molds 6 as above described the block 75 is moved toward the drum 4 so that the punches 84 enter the molds 6 and remove the briquets therefrom and they drop onto any suitable table or conveyer (not shown).

Having thus described our invention what we claim is—

1. In a briquet machine, in combination with a filler-box having a hopper delivering into the side of the filler-box, a plunger block slidably mounted in said filler-box, and a plate slidably mounted relative to said plunger block and having an upwardly extending flange to close the entrance to the hopper at times.

2. In a briquet machine, in combination with a filler-box having a hopper delivering into the side of the filler-box, a plunger-block slidably mounted in said filler-box, plungers secured to said plunger block, and a plate slidably mounted on said plungers and having an upwardly extending flange to close the entrance to the hopper at times.

3. In a briquet machine, a mold filling device comprising a filler-box, a plunger block slidably mounted in said filler-box, plungers having stems secured to said block, a pressure plate having holes to receive the heads of the plungers and flanges extending upwardly from its edge, a web extending from said flanges having holes to receive the stems of said plungers, and springs bearing against said block and web.

4. In a briquet machine, a mold filling device comprising a filler-box, a plunger block slidably mounted in said filler-box, plungers having stems secured to said block, sleeves secured to the plunger block and inclosing the plunger stems, a pressure plate having holes to receive the heads of the plungers and flanges extending upwardly from its edge, a web extending from said flanges having holes to receive the stems of said plungers, and springs bearing against said plunger block and web, said pressure plate being slidable on said plunger stems, its movement thereon being limited by the engagement of the web aforesaid with the heads of the plungers and the sleeves.

5. In a briquet machine, a mold filling device comprising a filler box, a plunger block slidably mounted in said filler-box, plungers having stems secured to said block, sleeves secured to the plunger block and inclosing the plunger stems, a pressure plate having holes to receive the heads of the plungers, and flanges extending upwardly from its edge, a web extending from said flanges having holes to receive the stems of the plungers, springs mounted on said sleeves and bearing against said plunger block and web, said pressure plate being slidable on said

plunger stems, its movement outwardly thereon being limited by the engagement of the web aforesaid with the heads of the plungers, and shoulders in the filler box to
5 engage the pressure plate and hold it from movement relative to the plunger block and plungers.

In testimony whereof we hereto affix our signatures in the presence of two witnesses.

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