No. 860,342. PATENTED JULY 16, 1907.

G. W. TAYLOR.

BRIQUET MACHINE.

APPLICATION FILED JULY 3, 1905.

3 SHEETS—SHEET 1

Fig. 1.

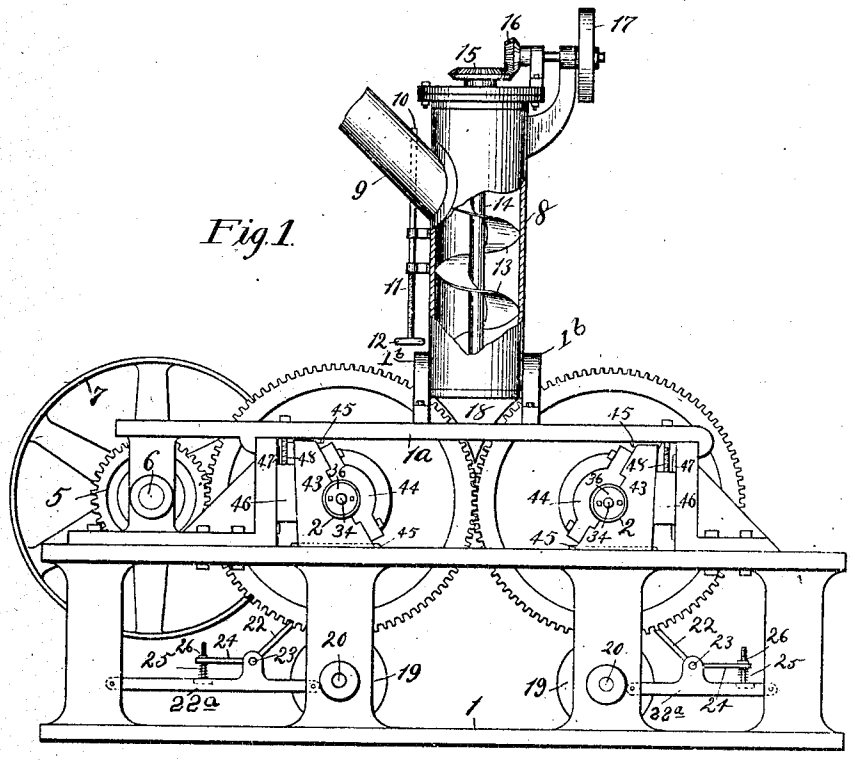
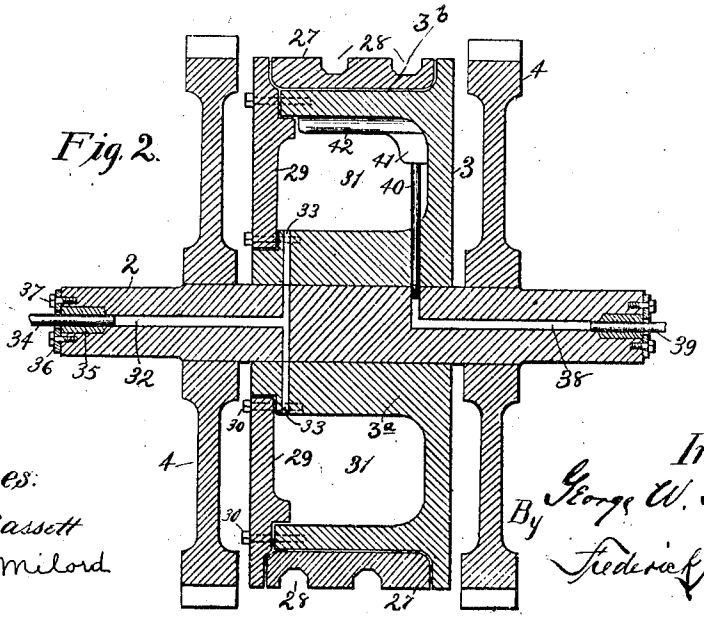


Fig. 2.



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3 SHEETS—SHEET 2.

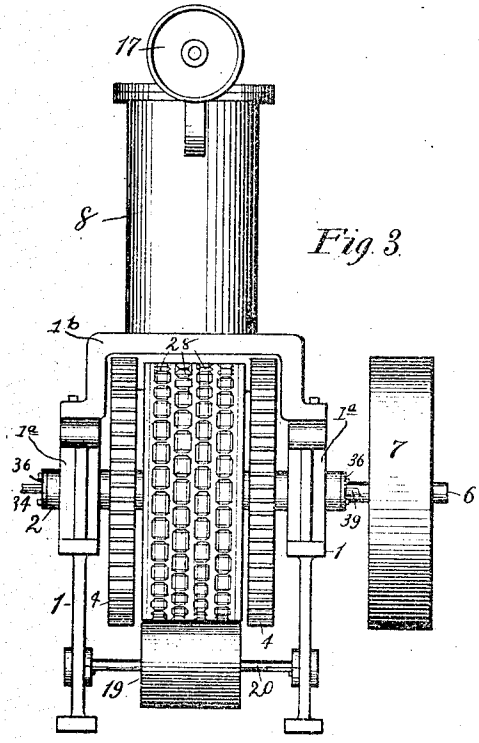
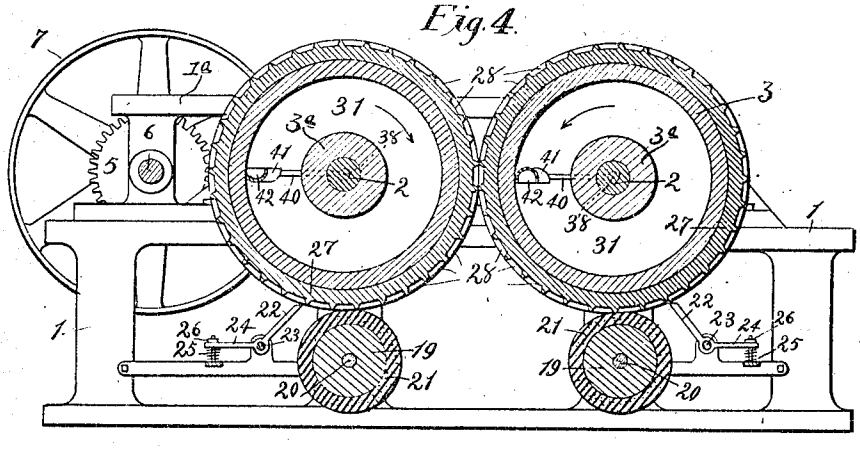


Fig. 3.

Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

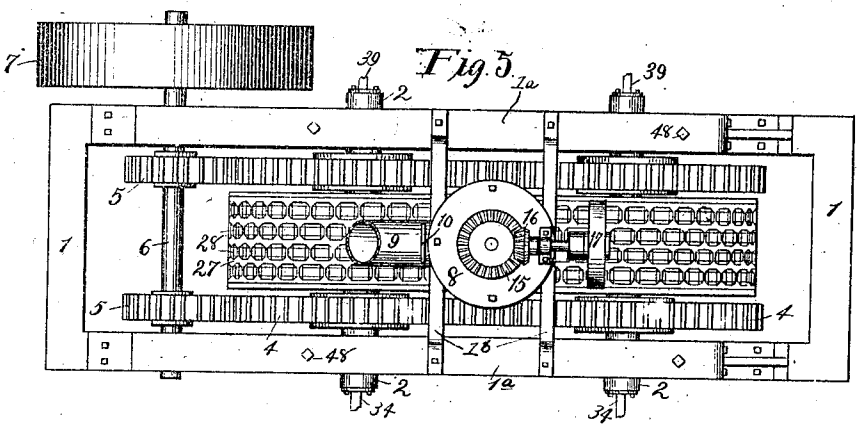


Fig. 6.

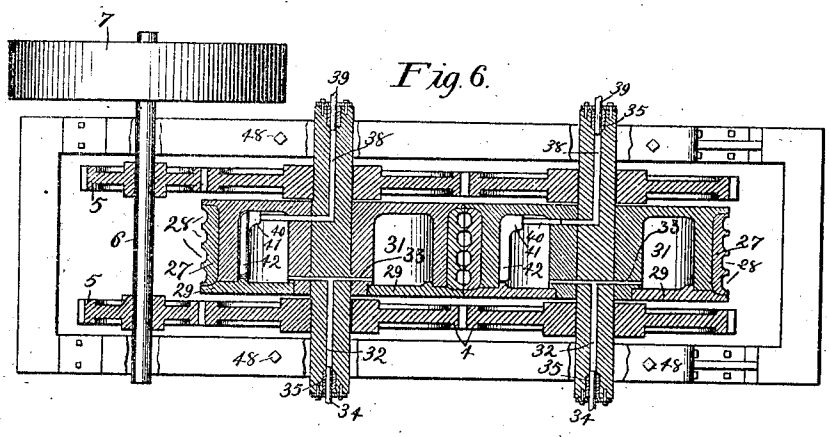


Fig. 7.

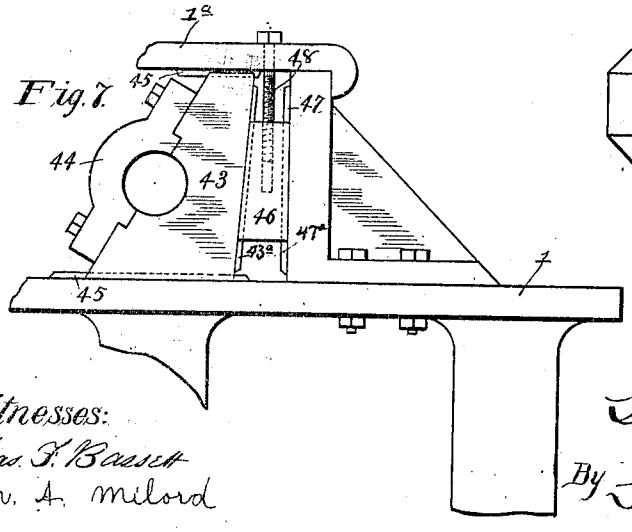
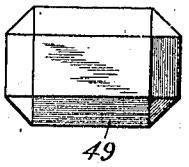


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE W. TAYLOR, OF ST. PAUL, MINNESOTA.

BRIQUET-MACHINE.

No. 860,342. Specification of Letters Patent. Patented July 16, 1907.

Application filed July 3, 1905. Serial No. 268,098.

To all whom it may concern:

Be it known that I, GEORGE W. TAYLOR, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Briquet-Machines, of which the following is a specification.

This invention relates to improvements in briquet making machines of the type which comprises revolving cylinders having peripheral registering mold sections which are filled from a suitable hopper, and in which the briquets are formed by compression in the molds between the co-acting cylinders and are discharged by suitable means.

The particular improvements which form the subject matter of this application relate to the construction of the mold cylinders; to means for introducing steam to the interior of the cylinders; to means for catching and discharging the condensation from the steam; and to means for discharging the molded briquets from their respective mold sockets where such discharge is not effected through gravity.

An important object of this invention is to produce a machine of the character named which will be of simple construction and therefore can be built economically; in which material adapted to the manufacture of briquets or similar products can be economically manufactured and in which the manufacturing processes are facilitated through the application of heat.

Having the aforegoing and other objects of general utility in view I have produced a machine which is shown in preferred construction in the accompanying drawings which form a part of this application and in which:—

Figure 1 is a side elevation of the machine with a portion of the hopper broken away; Fig. 2 is a vertical section on an enlarged scale through one of the cylinders which forms an important element of my invention; Fig. 3 is an end elevation of the machine; Fig. 4 is a longitudinal section through the machine with the hopper removed; Fig. 5 is a top plan view of the machine complete; Fig. 6 is a longitudinal section in a horizontal plane through the machine; Fig. 7 is a detail on an enlarged scale of one of the adjustable journal blocks which form an element of my invention, and Fig. 8 is a plan view of one of the briquets as produced by my machine.

Referring to the details of the drawings, 1 represents the main supporting frame of my machine which is a parallelogram in form and is provided with suitable vertical standards, and a top rail all of which may be formed and connected in any manner desirable. Rotatably mounted in suitable bearings to be described, are two shafts 2, 2, on which are respectively mounted and secured, in any suitable manner, cylinders 3, 3, and also, on opposite sides of each cylinder, gears 4, 4. Suitably journaled in upper extensions 1^a of the frame 1 is a shaft 6 on which pinions 5, 5, are fixed and on the outer end of which is secured a drive-wheel 7 to which power may be communicated in any approved manner. Extending transversely of the frame extensions 1^a, about midway between the ends of the machine, are two yokes 1^b, 1^b, the ends of which are bolted to the frame extensions referred to. Supported by said yokes is a cylindrical hopper 8 with the upper part of which is connected an inclined feed-spout 9, only a portion of the latter being shown in this connection. The passage of material through the spout to the hopper is controlled by a gate 10 which is slidably mounted in a vertical position across the spout and said gate is manually operated through a rod 11 which is supported in suitable brackets secured to the hopper with one of which it has a threaded engagement, and is supplied with a hand-wheel 12 at its lower end. Arranged in the hopper is a spiral conveyer blade 13 which is fixed on a vertical shaft 14 carrying at its upper end a bevel gear 15 which meshes with and is driven by a bevel gear 16 on one end of a horizontal shaft 17^a which is journaled in brackets secured to the hopper, and carries a drive pulley 17 at its outer end which may be driven in any suitable manner. Secured to the lower end of the hopper is a shoe 18 which fits between and conforms to the curvature of the cylinders and serves to guide the material from the hopper between said cylinders.

Journaled in the lower portion of the frame 1, are two shafts 20, 20, on which are fixed solid rollers 19, 19, faced with soft rubber coverings 21, the surface of which is in close frictional contact with the periphery of the respective cylinders, so that the rotation of the latter drives said rollers.

Secured to the standards of the frame are horizontal bars 22^a in which are journaled shafts 23 on which are mounted scrapers 22 having extensions 24 through holes in which pass threaded rods 26 supplied with nuts. An expansion spring 25 surrounds each of said rods between the extension 24 and the bar 22^a thus exerting an upward pressure on the extension 24 whereby the scraper is held in close frictional contact with the periphery of the cylinder, and is thereby enabled to remove any surplus material adhering to the face of the cylinder adjoining the mold sections. Each of the cylinders 3 is formed with a hub portion 3^a through which the shaft 2 passes, and with a countersunk peripheral face 3^b. On the face 3^b is fitted a steel tire 27 in which are formed, by countersinking, a plurality of mold-sections 28. One side of each cylinder 3 is open and has fitted thereto a circular plate 29 which is fitted and bolted by bolts 30 to the hub and peripheral portions of the cylinder, and the joints are suitably packed to make the interior chamber 31 of the cylinder, steam-tight. Each of the shafts 2 is centrally bored to form a longitudinal pas-

sage 32 the inner end of which connects with radial passages through the shaft which register with corresponding passages 33 in the hub portion 3^a of the cylinder. A pipe 34 passes through a stuffing-box 35—37 secured in the end of the shaft 2, and communicates with the passage 32. The pipe 34 may be connected with any suitable means for supplying steam thereto.

The shaft 2 is bored from its opposite end to provide a passage 38 the outer end of which communicates with a pipe 39 passing through a stuffing-box like that provided for the pipe 34. The inner end of the passage 38 is bored at right angles and communicates with a pipe 40 the outer end of which communicates with the covered portion 41 of the condensation gathering pan 42 which is arranged in the cylinder chamber 31 and suitably secured to the inner peripheral wall of same. The pan is open for the greater portion of its length which extends transversely of the cylinder so that it will catch or gather the condensation of the steam that fills the chamber 31. Bearing-blocks 43 having slideways 43^a are mounted on slideways 45 on the frame 1, 1^a, (Fig. 7) and together with the plates 44 furnish journal bearings for the shafts 2. Angular uprights 47 formed with slideways 47^a are bolted to the frame 1. Wedge-block 46 is slidably fitted to the slideways 43^a—47^a, and is operated by a screw bolt 48 which enters a suitable recess in the block and has a threaded engagement with the frame extension 1^a, whereby the screwing up or down of the bolt will serve to vertically adjust the block 46 and consequently horizontally adjust the bearing block 43, the effect of such adjustment being to throw the cylinders 3—3 toward or away from each other.

49 represents one of the briquets as formed in this machine.

A machine constructed as above described will operate substantially as follows in the production of briquets:—Steam will be introduced through the pipe 34 and channels 32—33 to the interior 31 of each cylinder 3 until it and the tire 27 are sufficiently heated to effect the best results, the degree of heat required depending upon the nature and condition of the material being manufactured. The cylinders are then rotated toward each other and the material fed from the hopper 8 between them, the mold-sections being filled by compression and the resulting briquets will be more or less dried on their surface, so that when they reach the under side of the cylinder they will drop by gravity on any suitable conveyer (not shown). Should any briquets fail to drop they will be carried around until they come in contact with the soft rubber roller covering 21 which will drive out the air, produce a partial vacuum and pull out the briquet which will be discharged from the periphery of the roller by the expansion of the rubber as soon as it is relieved from pressure. As the cylinders revolve, the condensed steam falls into the pans 42 and is carried therefrom by gravity through the pipes 40, conduits 38 and pipes 39.

It will be understood that the cylinders rotate slowly thus giving sufficient time to subject the surface of the briquets to the heat of the tire and adjacent part, and that the drying of the exterior of the briquets not only facilitates the removal by gravity, but serves to form a shell which materially aids in preventing the disintegration of the briquet until it has permanently set from subsequent thorough drying.

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

1. In a briquet machine, a supporting frame, shafts adjustably mounted on said frame, hollow cylinders secured to said shafts, said cylinders having one of their sides removable, a removable tire arranged on the periphery of each of said cylinders, said tire having recesses in its outer face, means for introducing steam into said cylinders, means for rotating said cylinders and means for feeding material into said recesses.

2. In a briquet machine, a supporting frame, shafts adjustably mounted on said frame, hollow cylinders secured to said shafts, each of said cylinders having peripheral flanges, a recessed tire seated on said cylinders between said flanges, means for introducing steam to the interior of said cylinders, means for carrying off condensed steam from said cylinders, means for rotating said cylinders, and means for feeding material to the recesses in said tires.

3. In a briquet machine, cylinders having recesses in their peripheral faces, means for feeding material to said recesses, means for heating said cylinders, and means for expelling the compressed material from said recesses, said means adapted to expel the air from the material and produce an outward suction on the material.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. TAYLOR.

Witnesses:
O. A. FRENCH,
F. A. JAMES.