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1,448,339.

F. W. FERNHOLTZ.
DIES.
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Fig. 1.

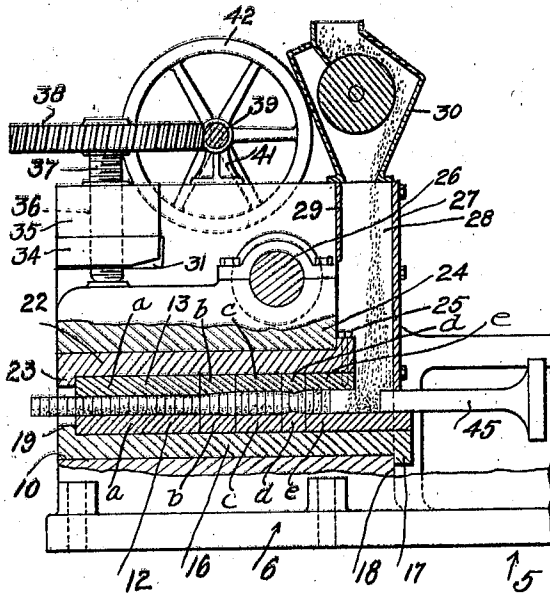


Fig. 2.

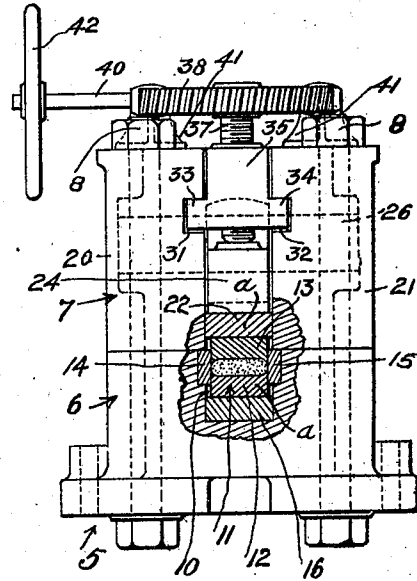
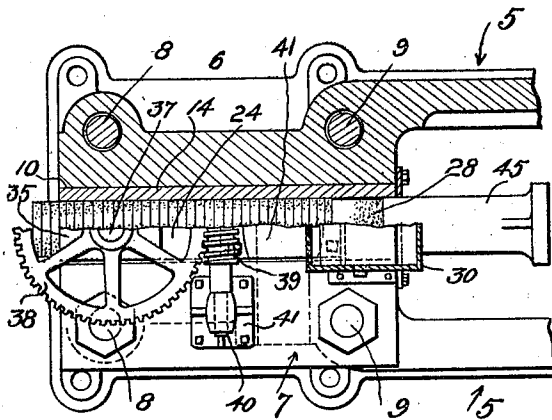


Fig. 3.



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FREDERICK W. FERNHOLTZ, OF LOS ANGELES, CALIFORNIA.

DIES.

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To all whom it may concern:

Be it known that I, FREDERICK W. FERNHOLTZ, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Dies, of which the following is a specification.

My invention relates more particularly to the class of die molds employed in coal briquetting machinery.

It is a main object of my invention to provide a sectional die mold whereby worn or pitted sections may be readily replaced, without the necessity of substituting entirely new die plates.

A further object of my invention is to provide a sectional die mold, in which the die molding cavity is of irregular form, whereby to regulate the density of the finished product.

Other objects and advantages will appear from the following description:

I accomplish the above objects by means of the regulating mechanism herein described and illustrated in the accompanying drawing, in which:

Fig. 1, is a side elevation of a portion of a briquetting machine illustrating my die regulating mechanism, parts being in section to more clearly disclose the structure.

Fig. 2, is a front end elevation of the briquetting machine showing the die regulating mechanism.

Fig. 3, is a plan view of the mechanism, parts of the same being illustrated in section.

In the formation of commercial briquets intended for fuel purposes, powdered or pulverized lignite has been generally employed, that material being readily compressed into suitable forms. The main difficulty heretofore experienced in compressing lignite is its ready absorption of moisture, its hardness, softness, plastic, or non-plastic condition, all of the above characteristics contributing in no small degree to the hardness and uniformity of the finished product.

Die molds generally employed in compressing the material above referred to, have been formed of two members, the opposing faces of the members when placed together forming the die molding cavity. This cavity heretofore has been of a form tapering from the cavity entrance to its exit.

to form a "choke," whereby the required density of the finished product may be attained. Owing to the fact that the compressing material often varies in texture, sometimes being moist and more or less plastic in its nature, and at other times extremely dry and non-plastic in consistency, the form of the die cavity has to be varied to suit conditions. During successive molding operations the forward portions of the upper and lower plates of the die mold often times become excessively worn and pitted requiring the substitution of new die plates.

By means of my sectional die mold the interior configuration of the die mold cavity may be readily altered to suit the varying conditions of the material being operated upon. Further when any of the sections become worn new ones may be readily substituted therefor without the necessity of replacing entirely new die members.

In the drawings, 5 designates the frame of the compression end of a briquetting machine of usual construction, the frame being bolted or otherwise secured to a support in any suitable manner. Frame 5 is divided transversely into a lower part 6 and an upper part 7, both parts being secured together by means of vertically disposed bolts 8 and 9, as clearly shown in Figs. 2 and 3 of the drawing. The lower part 6 of the frame 5 is provided on its upper face with a centrally disposed longitudinally extending recess 10, preferably rectangular in configuration, as shown, in which is disposed the lower and side portions of a briquet molding die 11. The die preferably consists of a lower plate 12 and an upper plate 13, each plate being divided into a plurality of sections *a*, *b*, *c*, *d* and *e*, the opposing faces of each of said sections forming a cavity of irregular form when placed in the die press, as clearly shown in Fig. 1 of the drawings, sections *b*, *b* and *d*, *d* of the two plates forming choked portions. By means of the choked portions formed by the sections, *b*, *b* and *d*, *d* the required density of the finished product may be readily regulated, and furthermore if the material being operated upon varies in texture or moisture, the sections *b*, *b* and *d*, *d* may be removed and other sections having opposing faces of different formation substituted therefor.

The side wall plates 14 and 15 of the die

are disposed in recesses formed in the upper side walls of recess 10, and the upper edges of said plates lie flush with the top surface of lower part 6 of the frame. The lower plate 12 of the die rests upon a bed plate 16 that extends from the outer end of the recess rearwardly, terminating in a downwardly extending lip 17 adapted to engage the transversely extending rear wall 18 of the frame to prevent any forward movement of said member. The forward end of member 16 is provided with an upwardly extending lip 19 against which bears the outer end of lower plate 12 of the die mold.

The upper part 7 of the frame preferably consists of two members 20 and 21 secured by the bolts 8 and 9 to the lower part of the frame, their outside faces lying flush with the side faces of lower part 6 of the frame. Members 20 and 21 are spaced apart so that the distance between their inner oppositely disposed side faces will be equal to the width of the recess 10 formed in the lower part 6 of the frame.

Mounted between the two members 20 and 21 and resting upon the upper removable die plate 13, is a removable plate 22 similar in configuration to the bed plate 16, with the exception that the lower transverse front end of said plate 22 is provided with a downwardly extending lip which engages the rear end face of a pivoted member 24. Plate 22 is rigidly connected to die member 13 at the rear end of bolts 25 or other suitable securing means, the bolts 25 maintaining the rear section of plate 13 of the die in position.

Member 24 is substantially the same length as plate 22 upon which it rests, and is pivoted at its rear end to a transversely disposed shaft 26, the ends of said shaft rotating in bearings formed in the sides of members 20 and 21 of frame part 7. Upper frame members 20 and 21 are connected at the rear end thereof by a plate 27, said plate forming a wall of a material chute 28, the front wall 29 of the chute 28 being secured between the two members 20 and 21 in any suitable manner. The removable plate 22 and the upper die plate 13 terminate short of the rear end of members 20 and 21 so as to form a passage for the material from the chute 28 to the interior of the die. Mounted directly over the upper end of material chute 28 is a feed hopper 30 of any suitable configuration through which material is fed downwardly to the die cavity.

Formed in the inner oppositely disposed faces of members 20 and 21 are longitudinally disposed recesses 31 and 32 which extend from the front end rearwardly a short distance. Mounted in recesses 31 and 32 are the lower projecting side walls 33 and 34, of an inverted T-shaped screw block 35, the upper end of said block terminating

flush with the top face of members 20 and 21. This block is provided with a threaded aperture 36 in which is mounted a vertically disposed threaded shaft 37, the lower end of said shaft bearing against the outer end of pivoted member 24. To the upper end of shaft 37 is rigidly secured a worm wheel 38, said wheel meshing with the worm 39 rigidly secured to a shaft 40, mounted in a pair of bearings 41 secured to the upper face of members 20 and 21, as clearly shown in Figs. 1 and 2 of the drawings. To the outer end of shaft 40 is pivotally secured an operating wheel 42 by means of which the worm is rotated to raise or lower the vertical shaft 37 when it is desired to increase or diminish the size of the die mold.

The operation of my die regulating mechanism will be clearly apparent from the following description:

When the machine is ready for a briquetting operation, the material is fed downwardly through the hopper 30 and chute 28 to the die mold entrance, the hopper feeding the exact quantity of material required for forming a single briquet. The plunger 45 on a reciprocation forces the material delivered to the mold into the same until the entire length of the mold has been filled. Each time the plunger is withdrawn after a compressing operation a partial vacuum will be formed within the mold at the entrance thereof that will suck a fresh charge therein for the succeeding operation of the plunger, the finished briquets being continually discharged from the front end of the die. The operator then examines the briquets for any defects and tests their density or hardness, and if the same are not of sufficient hardness for commercial use, the hand wheel 43 is turned slightly to rotate the vertical shaft 37 downwardly or against the outer end of pivoted block member 24 to tilt the same, thereby diminishing the size of the mold cavity. The adjustment of pivoted block member 24, above or below its normal horizontal position, is not over one-sixteenth ($\frac{1}{16}$) of an inch, often a much slighter adjustment being all that is necessary to obtain the desired results. The movement of shaft 37 is so slight that the worm wheel will not become disengaged from the worm.

If for any reason some of the forward end die mold sections should become badly worn or pitted during successive molding operations, they may be readily replaced, also if it is desired to change the tapered formation of some of the forward sections, new ones of a different formation may be substituted therefor, this being impossible with die plates formed of two single members.

From the above description it will be apparent that I have devised an extremely simple and sensitive mechanism, whereby

it will be possible to quickly regulate the size of a die mold to accommodate the same to the particular type of material that is fed thereto.

5 What I claim is:

A die mold, comprising upper and lower members divided transversely into a multiplicity of sections, the opposing faces of said members being of such configuration
10 that a molding cavity will be formed having

a plurality of choked portions intermediate the ends of said members, whereby the configuration of the molding cavity may be readily changed to suit the varying conditions of the material that is being molded. 15

In witness that I claim the foregoing I have hereunto subscribed my name this 9th day of March, 1918.

F. W. FERNHOLTZ.