

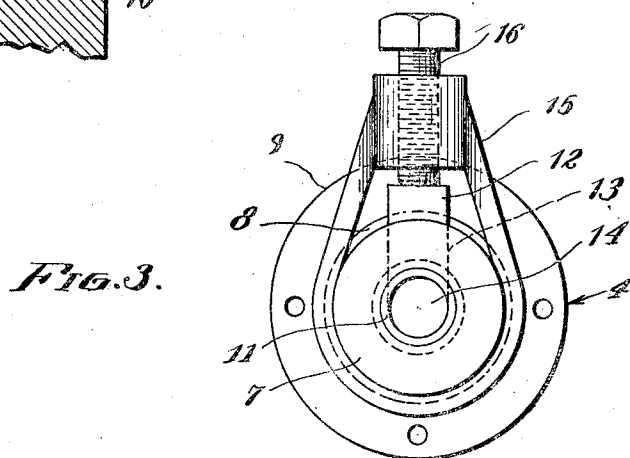
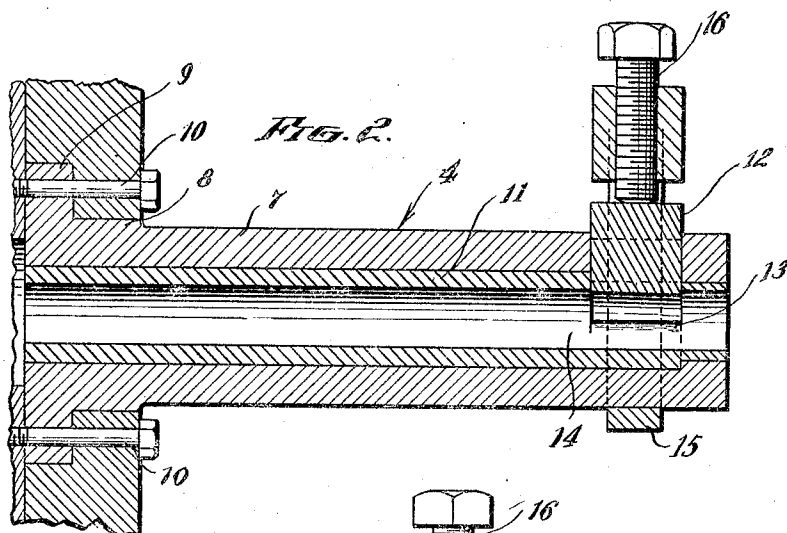
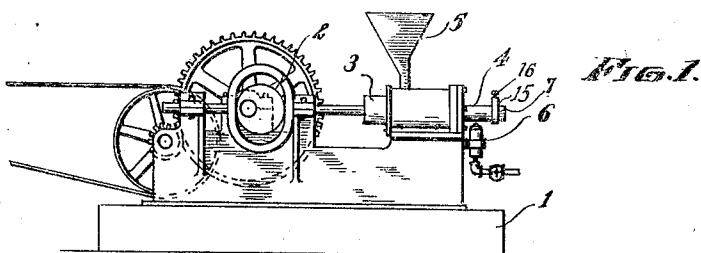
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DIE FOR THE CONTINUOUS PRODUCTION OF CELLULOSIC FUEL

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UNITED STATES PATENT OFFICE.

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DIE FOR THE CONTINUOUS PRODUCTION OF CELLULOSIC FUEL.

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This invention relates to a die for molding cellulosic material and is more particularly directed to a die having a restricted passage for continuously molding a fuel from finely divided cellulosic materials while the said cellulosic material is being subjected to heat. Sawdust, straw, shavings, and other cellulosic materials have been used in some places as a fuel. The disadvantage of the employment of these cellulosic materials is that they are too bulky and difficult to handle, while their heating value, which depends upon the amount of moisture they contain, is seldom more than one-third to one-half of that of good coal. Any of these finely divided cellulosic materials thrown into a furnace in such a finely divided state likewise have a tendency to choke the fire.

Heretofore, many attempts have been made to produce a compact fuel from such cellulosic materials, which attempts have been more or less limited to what might be called "baling" of the loose particles of said cellulosic materials. This invention relates primarily to a die in which the cellulosic material is bound together to form a compact fuel while said cellulosic material is being heated and subjected to pressure, producing a fuel more compact than ordinary wood, having the advantages of ordinary wood, and in addition being less expensive, as the materials used, for the most part, are what might be termed "industrial waste."

An object of this invention is to produce a die in which the cellulosic material may be bound together to form a compact fuel by subjecting the cellulosic material to the effects of heat and pressure.

A further object of this invention is to provide a die which may be employed in connection with a continuous process for the production of such a compact fuel of cellulosic material.

Further objects and advantages of this invention will be apparent from the following detailed description of a preferred embodiment thereof.

In the drawing:

Figure 1 is a side elevation of a machine to which this die may be adapted, illustrating a means of feeding the waste cellulosic ma-

terial into the die, and a means of heating the die while in position on the machine.

Fig. 2 is a sectional side elevation of a die embodying this invention.

Fig. 3 is an end elevation of a die embodying this invention, taken from the right to the left of Figure 1.

A compression machine 1 comprises a means 2 for providing a reciprocating motion to a plunger or piston 3, which plunger or piston is adapted to reciprocate within the die 4, forcing the finely divided cellulosic material, as received from a feeding mechanism 5, into and through the die 4. Any suitable means 6 may be provided for heating the die 4, or the cellulosic material may be heated in the feeding mechanism 5.

The construction of this novel die is substantially as follows:

The body 7 is formed as a solid cylinder of steel having a collar 8 and a flange 9, the flange 9 being adapted to be secured in position on a suitable compression machine, as illustrated at 10. The collar 8 is provided to aid in the centering of the die on the machine and likewise aid in reinforcing the die. The pressure is applied to the cellulosic material injected into the die by the plunger 3. A core 11 having an interior diameter of substantially the size fuel desired is adapted to fit within the cylindrical body 7 and is preferably constructed of cast iron, and may be removed or replaced as it wears.

A choke block 12 is adapted to fit within a recess 13 cut in the cylindrical body 7 and the core 11. The choke block 12 is adapted to be forced into the passage 14 within the core 11 to restrict the passage 14 so that the cellulosic material will be forced to choke in the die at this point. By this means, in connection with the plunger 3, the desired pressure is obtained upon the cellulosic material as the same is heated by any suitable means 6. A stirrup 15 having a screw 16 is adapted to encircle the cylindrical body 7 so that the screw 16 abuts the choke block 12 in such a manner that by turning the screw 16, the choke block may be forced into or allowed to recede from the interior 14 of the core 11 in such a manner that the pressure

obtained upon the cellulosic material is thereby determined.

The manner in which this novel die 4 is employed is substantially as follows:—

5 The plunger 3 is reciprocated by a suitable means 2 and is adapted to receive the finely divided cellulosic material from the feeding mechanism 5, forcing the cellulosic material into the die 4, the material being properly
10 heated in the die. As the passage 14 is restricted by the choke block 12, the cellulosic material is compressed in the die and, as the compression proceeds, is forced past the choke block 12 and leaves the die 4 as a com-
15 pressed stick of fuel bound together by the organic constituents of the cellulosic material. As the compressed stick of fuel leaves the die 4 it is sawed or otherwise broken in-
20 to the desired lengths for use in furnaces, stoves, or the like.

Having fully described a preferred embodiment of this invention, it is to be understood that I do not wish to be limited to the

exact construction herein disclosed, which may obviously be varied without departing
25 from the spirit of this invention as set forth in the appended claim.

I claim:

A die for the continuous production of cellulosic fuel comprising a tubular body, a
30 tubular core mounted within the tubular body and having a uniform central passage therethrough, a flange formed at one end of the body to detachably mount the said die,
35 a slot formed in the body and in the core at the opposite end thereof, a segmental choke block mounted in the slot, a stirrup surrounding the body and having means
40 screw threaded therethrough for engaging the segmental choke block for adjustably holding the said block in position within the said slot.

Signed at Los Angeles, California, this
29th day of February, 1924.

GEORGE C. HUMPHREY.