March 16, 1926. 1,577,015

H. L. GLAZE

FUEL FORMING DIE

Filed August 18, 1924

Fig. 1

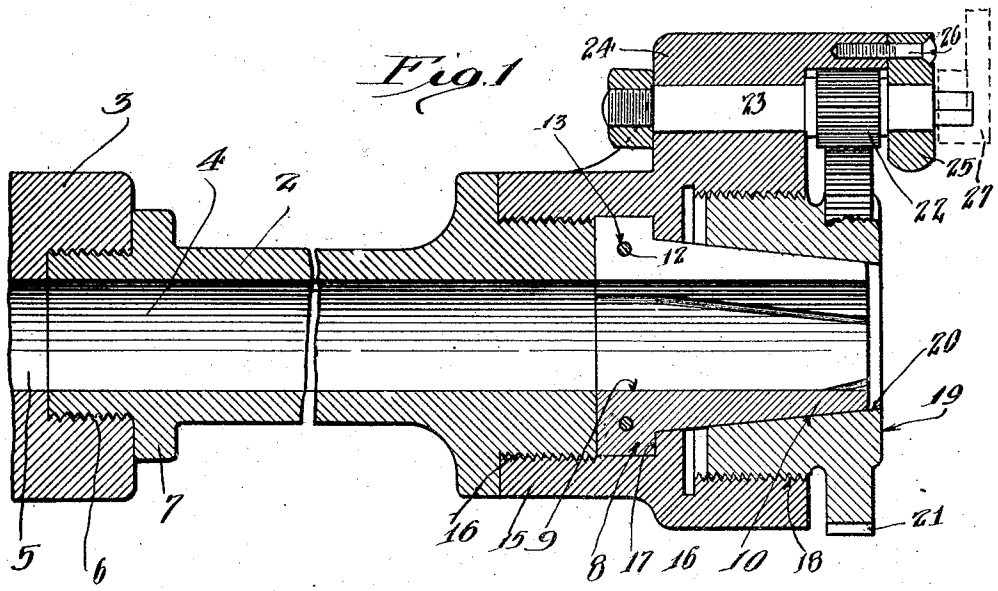


Fig. 2

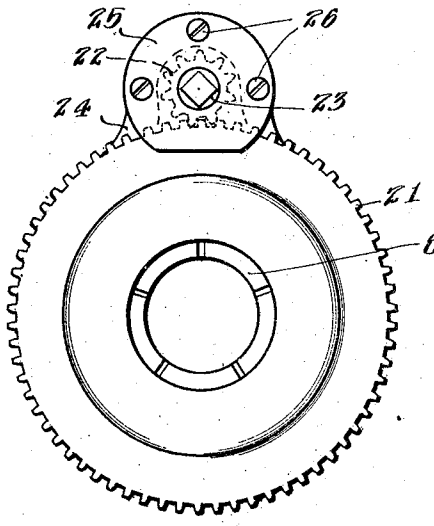


Fig. 3

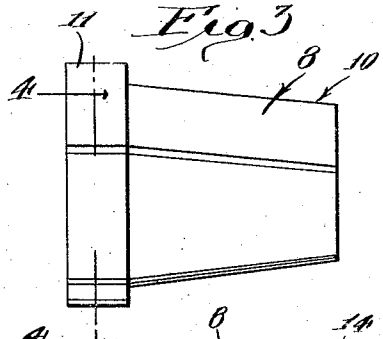
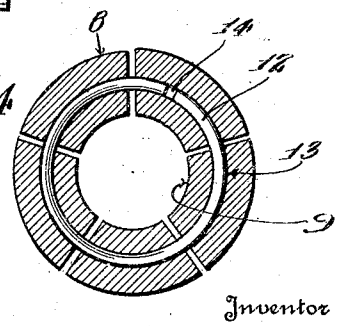


Fig. 4



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Patented Mar. 16, 1926. 1,577,015

UNITED STATES PATENT OFFICE.

HERBERT L. GLAZE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO UNITED PRODUCTS COMPANY, INC., OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

FUEL-FORMING DIE.

Application filed August 18, 1924. Serial No. 732,739.

To all whom it may concern:

Be it known that I, HERBERT L. GLAZE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented a new and useful Fuel-Forming Die, of which the following is a specification.

This invention relates to a fuel forming die for molding cellulosic material into fuel as it is continuously received from an extruding machine, and has for its principal object to provide an improved form of fuel forming die for such a machine.

Sawdust, straw, shavings, and other cellulosic materials have been used in some places as fuel. These materials are very bulky and difficult to handle in their original state, and when thrown into a furnace in their original, finely divided state operate to smother or choke the fire. To overcome this disadvantage, attempts have been made to produce a compact fuel from such cellulosic material. In the copending application of George C. Humphreys, Serial No. 697,454, filed March 7, 1924, is described a die for the continuous production of cellulosic fuel by means of which die it is rendered possible to take finely divided cellulosic material and, by subjecting the same to heat and pressure, and through a suitable extruding machine, this material is forced through the die, where it is continuously pressed into solid sticks which may be broken up and used as lump or stick fuel with great advantage over the employment of the finely divided cellulosic fuel.

An object of the present invention is to provide a die by which the cellulosic material may be more readily bound together to form a compact fuel when the cellulosic material is subjected to heat and pressure and expelled from the extruding machine.

Another object of the invention is to provide a die for compressing such cellulosic material into fuel, which includes certain novel means for restricting the discharge of material from the cellulose extruding machine, which restricting means may be readily varied to control the outlet from the machine and the resulting pressure applied upon the cellulosic fuel.

Various further objects and advantages of this invention will be apparent from a description of a preferred form of fuel compressing die embodying the invention, for which purpose reference is made to the accompanying drawings in which the invention is shown in its preferred form.

In the drawings:

Figure 1 is a side elevation, mainly in longitudinal section, of the die embodying the invention.

Fig. 2 is an end view of Figure 1.

Fig. 3 is a side elevation of the segmental choke members employed in the die, and

Fig. 4 is a sectional end view, taken on the line 4—4 of Figure 3.

The die shown in the drawing embodies a member 2 through which the cellulosic material is forced in order to compress and pack the same into a stick of solid fuel, the cellulosic material being fed to the member 2 from a suitable cellulosic material extruding machine, such, for example, as is disclosed in the copending application of George C. Humphreys, previously referred to, 3 indicating a portion of such machine. The member 2 is provided with a central bore 4 aligning with the bore 5 of the machine, and is preferably held to the machine by threads 6 at one end, the member 2 having an annular flange 7 abutting the portion of the machine illustrated at 3 to provide a means for aligning the die therewith. The bore 4 of the member 2 discharges through a plurality of segmental choke members 8, the details of which are more clearly shown in Figures 3 and 4. The choke members have segmental, cylindrical walls 9 which, together, define a varying discharge bore for the die, and through the greater portion of their length, the outer walls outwardly contract, as shown at 10, the walls being curved frusto-conically, and the inner end of the segmental choke members are flanged outwardly, as at 11, for a purpose hereinafter to be pointed out.

The segmental choke members 8 are held together by a wire 12 extending through openings 13 in the enlarged portion 11 of the members 8, the wire 12 having one or more breaks, as indicated at 14 so that it may contract or expand to bring the members closer or further apart to vary the cylindrical discharge port formed thereby.

The segmental choke blocks 8 are held by a head 15 against the end of the member 2, the head 15 being screw-threaded to the member 2 as indicated at 16. 17 indicates a shoulder on the head 15 engaging the

outer side of the flanges 11 of the members 8 to maintain the segmental choke member 8 against longitudinal movement. The head 15 is provided at its outer end with a threaded socket 18 which receives a collar 19 having an outwardly tapering bore 20 which engages the outer tapered walls 10 of the choke members. The collar 19 is provided with gear teeth 21, exteriorly of the socket 18, by which gear teeth the collar 19 is screwed into or out of the socket 18 so as to contract the choke members 8 or permit the same to expand, said gear 21 being driven by a gear 22 mounted on a shaft 23, the shaft 23 being supported in a lug 24 on the head 15 at one end, and the outer end of the shaft being supported in a bracket 25 held to the lug 24 by suitable means, such as screws 26. The outer end of the shaft is provided with suitable control means, such as the handle 27.

The operation of the die will now be described:

The cellulosic material, preferably heated, is fed into the member 2 by the extruding machine of which 3 is a part, and caused to pass through the bore 4 thereof, which initially forms the same into a bar or stick of fuel. In order to properly compress and solidify the same the outlet of the bore 4 is restricted by means of the segmental choke members 8, these members being brought together a desired distance by screwing the collar 19 into the socket 18 through operation of the handle 27. It will be observed that any desired restriction of opening may be readily obtained by motion of the handle 27, and this form of restricting the choking means permits a small force upon the handle 27 to cause constriction of the discharge bore due to the reduced form of gearing provided by the combination of parts. The restriction of the discharge bore causes the cellulosic material to be thoroughly compressed in the die and the material leaving the segmental choke blocks 8 is firmly bound into a bar or stick of fuel, which may be broken or sawed into desirable pieces for use in furnace, stove, or the like.

While the fuel forming die herein described is well suited for accomplishing the purposes of this invention, it is to be understood that various modifications may be made in details of construction without departing from the spirit of the invention. This invention is of the scope set forth in the appended claims.

I claim:—

1. A fuel forming die comprising means providing a fuel forming bore, and segmental choke members operative to restrict the discharge from the bore, the segmental members having tapered outer surfaces, means engaging the outer surfaces shiftable relative thereto to expand or contract the segmental members and expandible means mounted with the segmental members for holding the said members together.

2. A fuel forming die having segmental choke members forming the discharge opening of the die, a collar engaging the choke members operative on a longitudinal motion relative thereto to expand or contract said members, a head supporting said segmental members screw-threaded to said collar, and gear actuated means for screwing the collar into or out of the head so as to cause said longitudinal movement.

3. A fuel forming die comprising a head, a collar threaded to said head, said collar having a tapered bore, segmental choke members engaging said bore, a gear formed on said collar, and a gear engaging said first mentioned gear, means for turning the second gear and a wire secured to the segmental members for maintaining the said members together.

4. A fuel forming die comprising a head, segmental choke members supported in the head, the segmental choke members defining a discharge opening for the die, a wire connecting said members, a collar threaded to said head having a tapered engagement with the segmental members, and reduction gear connected to the collar operative to screw the same relative to the head, thereby expanding or contracting the segmental members.

Signed at Los Angeles, California, this 18 day of July, 1924.

HERBERT L. GLAZE.