

W. D'A. RYAN.
PROCESS OF MAKING BRIQUETS.
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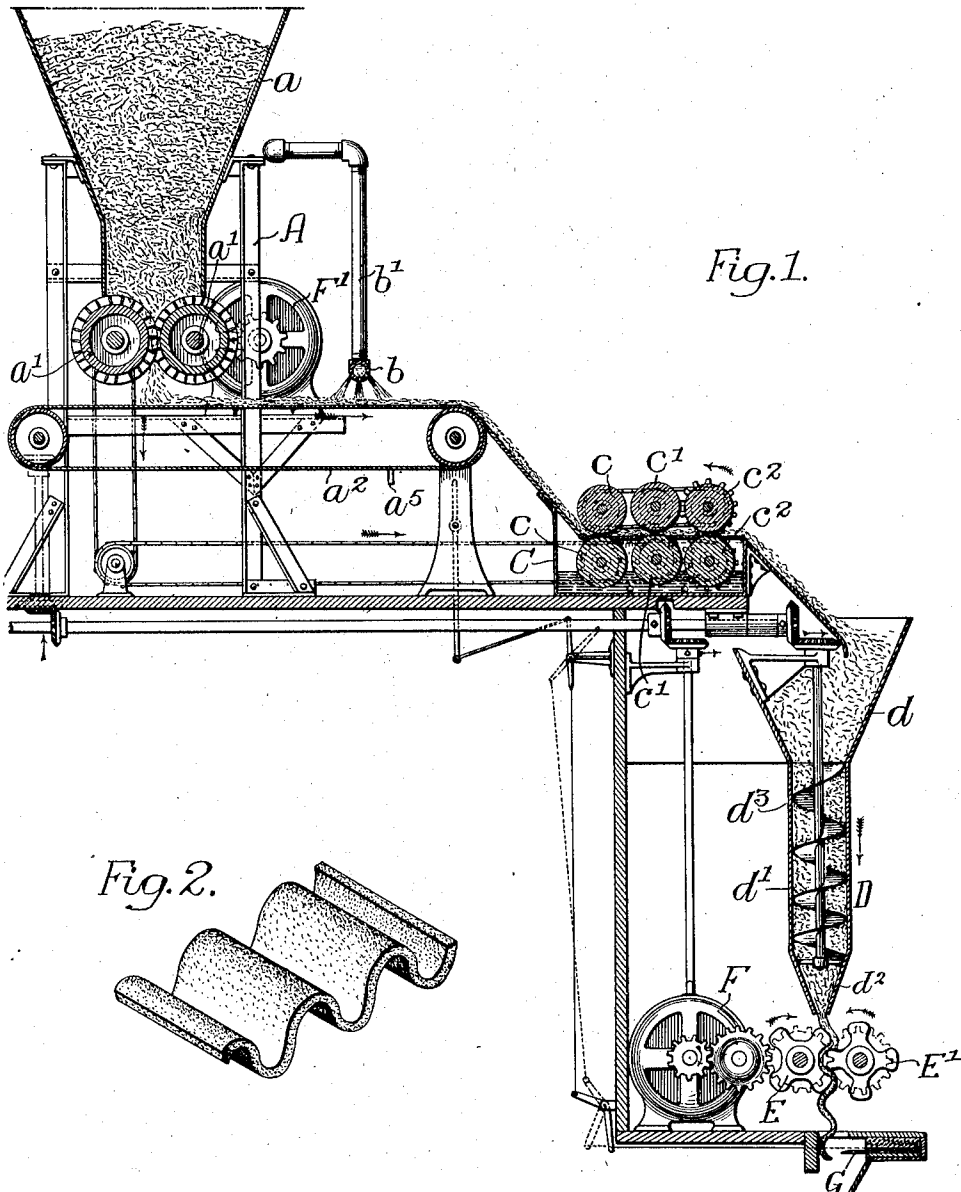
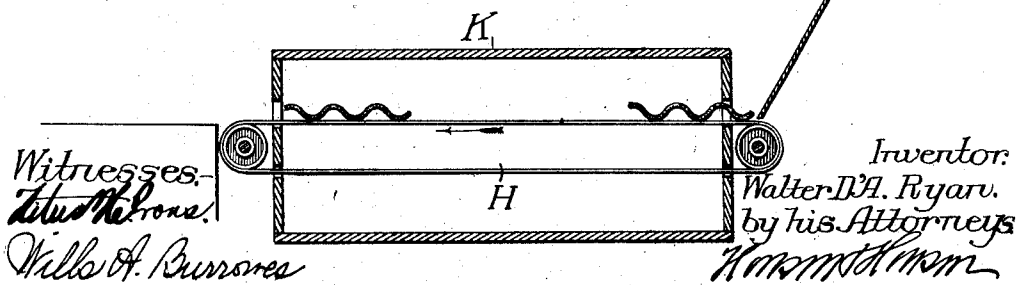
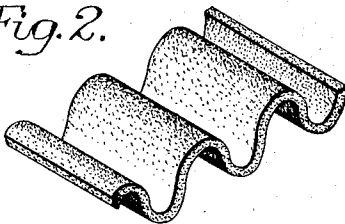


Fig. 1.

Fig. 2.



Witnesses:
John H. Malone
Wills H. Burrows

Inventor:
Walter D'A. Ryan.
by his Attorneys
Wm. H. H. H. H.

UNITED STATES PATENT OFFICE.

WALTER D'A. RYAN, OF WATERTOWN, SOUTH DAKOTA, ASSIGNOR OF ONE-HALF TO ANTHONY C. DOUGLAS, OF NIAGARA FALLS, NEW YORK.

PROCESS OF MAKING BRIQUETS.

1,003,296.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER D'A. RYAN, a subject of the King of Great Britain and Ireland, (having declared my intention of becoming a citizen of the United States,) residing in Watertown, South Dakota, have invented certain Improvements in Processes of Making Briquets, of which the following is a specification.

One object of my invention is to provide a novel method of treatment for material capable of being made into briquets whereby this may be compacted and finally delivered in such form as to render it available for use as a practicable fuel in stoves or furnaces.

Another object of my invention is to provide a process for manufacturing briquets from vegetable substances such as straw and the like.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1, is a vertical section, somewhat diagrammatic in form, illustrating a combination of apparatus which may be employed for carrying out my invention; and Fig. 2, is a perspective view of the novel form of briquet produced by my method.

In certain sections of the country, notably those in which wheat is largely grown, there are produced each year immense quantities of straw for which no commercial use has as yet been found, and it is now customary at the end of the harvest season to burn the same.

While various forms of stoves and furnaces have been devised for utilizing straw as a fuel, these have not been practical owing to the loose and uncompact nature of the straw and of the relatively large combustion chambers necessarily required.

I have therefore devised a process whereby straw may be practically and inexpensively formed into briquets of such a form as to be available for use in furnaces of the ordinary construction.

In carrying out my process I may employ the apparatus shown in the drawing, in which a is a hopper of suitable size for the reception of loose straw. This is mounted upon a supporting frame-work A and is designed to deliver the straw to any desired form of comminuting mechanism such as

the two rotary cutting wheels a' from which the finely divided straw will be directed to a traveling conveyer a^2 . Although the length of the cut pieces may vary within the wide limits, I prefer that such length should not exceed about one inch.

While supported on the conveyer I saturate the cut straw with some inexpensive binder delivered from a nozzle or head b connected to any suitable source of supply by a pipe b' . I may employ coal tar, molasses or any other liquid or viscous material as a binder depending upon its cost or availability for the purpose, and in order to free the cut straw from any surplus of such material, I deliver it to one or more pairs of press rolls c , c' and c^2 , below which is a receptacle C for collecting the expressed liquid.

It will be understood that after passing through these press rolls the straw is still sticky or tacky and is collected in the hopper d of a briqueting press D whereby it is given the form of the finished briquets. In carrying out my process I prefer that it should be continuous in operation, and with this idea in view said press D is provided with a cylindrical casing d' leading from the hopper d and terminating in an elongated rectangular nozzle d^2 .

Within the cylindrical portion of the casing is mounted a screw conveyer d^3 the pitch of whose blades preferably increases from the hopper to the nozzle by an amount found most efficient under operating conditions and with the size of the nozzle orifice depending on the pressure to which it is desired the material shall be compressed.

In the present instance I have mounted below the briqueting press two intermeshing corrugated rolls E and E' which may be driven at a suitable speed from a motor or other source of power indicated at F , and for the purpose of cutting off the briqueted material into suitable lengths, I provide a knife G . Said knife may be actuated in any desired manner; and in the present instance it is driven through a series of links and levers from a pivoted bar g which is periodically actuated by abutments a^5 mounted on the conveyer a^2 . Through suitable driving mechanism the motor F may be caused to actuate the screw press conveyer d^3 as well as the apron conveyer a^2 . The press rolls c , c' and c^2 with the rotary

cutters *a'* may be driven from a second motor or other source of power indicated at *F'*.

Under operating conditions the straw is fed into the hopper *a* and after being cut or finely divided by the cutter *a'*, is sprayed or saturated with a binding material delivered from the nozzle *b*. It then passes through the press rolls *c*, *c'* and *c''* whereby the surplus of such binding material is removed and is then delivered to the hopper *d*. From this it is continuously taken by the press screw *d'* by which it is subjected to heavy pressure as it is forced through the casing *d''* into the nozzle *d''*. The compressed material escapes from said nozzle in a flat continuous sheet which is more or less flexible and is continuously corrugated by being caused to pass between the rolls *E* and *E'*. The periodic action of the knife *G* cuts the strip of compressed material into sections of predetermined length of the form shown in Fig. 2.

In the present instance I have illustrated the corrugated briquets as being delivered onto a conveyer *H* which, if desired, may be made to operate within a baking or drying oven *K* whereby said briquets may be raised to such temperature as to cause the binder to be coked or otherwise changed in order to render the briquets hard or water proof as may be desired, depending upon the nature of the material used. It is obvious

that in some instances this oven may be dispensed with and the briquets merely permitted to dry in the air. 35

It is obvious that the dimensions of the various pieces of the apparatus and of the parts thereof may be varied to suit the treatment not only of various grades of straw and of binders, but also for the purpose of rendering the process available for the briqueting of other forms of vegetable material such as weeds, brush, waste lumber, sawdust or the like. 40 45

In treating straw or other tubular fiber I find it advisable to saturate it with a binder after it has been cut in order that its inner surfaces may stick together after passage through the press or briqueting machine. 50

I claim:

A method of making briquets which consists in comminuting straw, adding a surplus of binder thereto sufficient to moisten the interior surfaces of the straw; removing the excess of binder; and compressing the remaining mixture of binder and straw in the form of a sheet. 55

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses. 60

WALTER D'A. RYAN.

Witnesses:

A. W. RANSOM,
BROWNIE MATHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."