

E. B. A. & R. A. ZWOYER.

BRIQUET.

APPLICATION FILED NOV. 25, 1912.

1,258,849.

Patented Mar. 12, 1918.

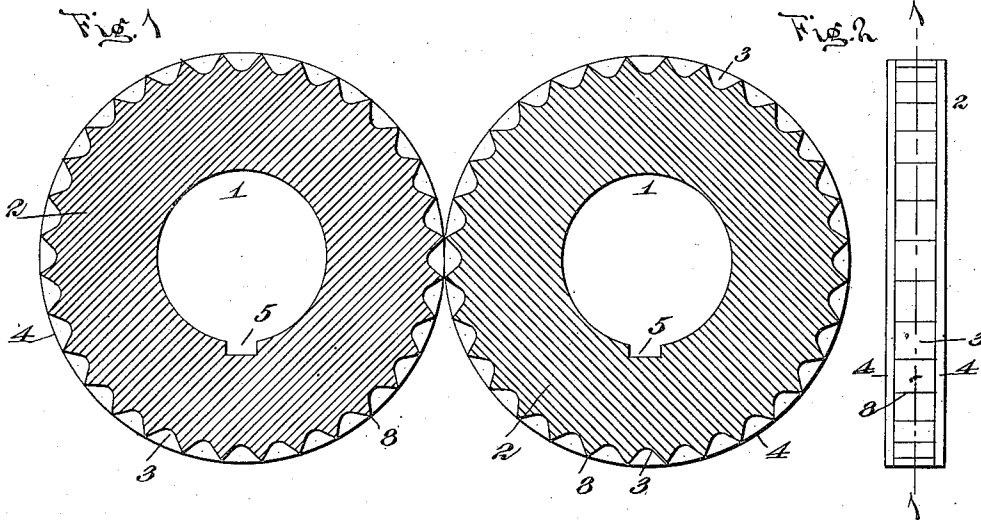


Fig. 3

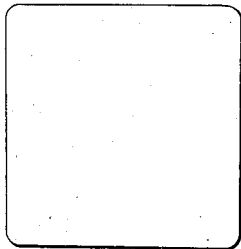


Fig. 4

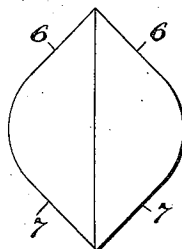
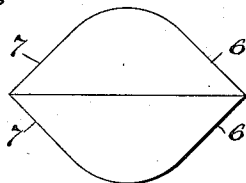


Fig. 5



Witnesses:

*John L. Fitch.*  
*Geo. J. Hanson*

Inventor

*Ellsworth B. A. Zwoyer*  
*Roland A. Zwoyer*  
*By Adam Taylor* Attorneys.

# UNITED STATES PATENT OFFICE.

ELLSWORTH B. A. ZWOYER, OF PERTH AMBOY, NEW JERSEY, AND ROLLAND A. ZWOYER, OF PORTSMOUTH, RHODE ISLAND, ASSIGNORS TO THE ZWOYER FUEL COMPANY, A CORPORATION OF NEW JERSEY.

## BRIQUET.

1,258,849.

Specification of Letters Patent.

Patented Mar. 12, 1918.

Original application filed October 26, 1908, Serial No. 459,576. Divided and this application filed November 25, 1912. Serial No. 733,329.

*To all whom it may concern:*

Be it known that we, ELLSWORTH B. A. ZWOYER and ROLLAND A. ZWOYER, both citizens of the United States, said ELLSWORTH B. A. ZWOYER being a resident of Perth Amboy, county of Middlesex, State of New Jersey, and the said ROLLAND A. ZWOYER being a resident of Portsmouth, county of Newport, State of Rhode Island, but formerly of Perth Amboy, county of Middlesex, State of New Jersey, have invented certain new and useful Improvements in Briquets, of which the following is a specification.

Our invention is directed particularly to improvements in briquets, which are molded or formed between two tangentially arranged molding rolls or drums provided with briquet forming pockets, and is a division of an application for patent filed by us October 26, 1908, Serial No. 459,576.

The objects of the invention are to provide a briquet of such novel shape that it will have great strength and durability and of equal density throughout its mass. These and further objects will more fully appear from the following specification and accompanying drawings, considered together or separately.

In the drawings,

Figure 1 is a sectional view of a pair of rolls, having pockets of the proper shape to make the novel briquet, such section being taken on the line 1—1 of Fig. 2.

Fig. 2 is an edge view, illustrating the nature of the briquet making pockets of the rolls, and the manner of constructing the same.

Fig. 3 is a plan view of the briquet.

Fig. 4 is an edge view of the same; and

Fig. 5 is a similar view, at right angles, to Fig. 4.

In all of the several views, like parts are designated by the same reference characters.

In U. S. Patent No. 667,050 is disclosed a form of briquet which resulted from the use of the machine illustrated in that patent. This form of briquet, however, does not possess the required density nor strength, being somewhat fragile, and by reason of the structural nature of the forming cups or pockets disclosed in said patent, the best results are not had in transportation and construction with such briquet. The present

improvement is designed also to overcome this objectionable feature.

In Figs. 1 and 2 are illustrated the detail structure of the rolls or drums 1, 1 and the manner of constructing the same. Each drum consists of a series of annular disks 2, 2, each being cast in the manner illustrated in Fig. 2; with a series of complete integral pockets 3, 3 in their outer or edge faces. Each pocket has the conformation of the frustum of a pyramid with a rounded apex or top and rectangular base. After they are thus cast with relatively heavy marginal surfaces 4, 4 upon the side faces of the disks (see Fig. 2), they are then placed in a planer, and these surfaces planed off so that the lateral edges of the pockets on both sides assume a knife-edge configuration. The edges between the pockets are dressed with a tool to the sharpest possible condition.

These disks are each provided with a keyway 5, and are then grouped and bolted together upon the supporting shafts (not shown), in the same manner as disclosed in our pending application for patent before identified, so that all of the edges of the pockets are in alinement with each other, both tangentially and radially, and by these means we are enabled to produce a roll or drum in which the completed pockets are absolute duplicates of each other throughout the entire surfaces of the rolls and are located in such relation to each other that the nicest cutting effect is had in the dividing up of the material as it is fed forward during the process of making the briquets. When these disks are assembled on their supporting shafts, the edges of the pockets are all in alinement in planes in each direction.

We have ascertained that by the use of such briqueting rolls, we are enabled to produce a briquet like that illustrated in Figs. 3, 4 and 5 of the drawings, each having the cleanest possible surfaces and edges, and one in which the density is practically constant throughout its mass, and also of such structural form that the greatest possible strength is given thereto, thus making it not only an article which will permit of transportation without undue breakage, but also one which, as we have ascertained in practice, gives a

maximum combustion effect. The form of this briquet is, as will be obvious on inspection of Figs. 3, 4 and 5, that of the frustum of two pyramids having their rectangular bases integrally united, while the frustum ends thereof are slightly rounded.

It will be apparent by reference to the drawings that the lines 6 and 7 of the sides of the briquet bear a relation of substantially 90° to one another. When the material is going through the pocket in commercial quantity, the briquet being formed is subjected to compressing and grinding action, caused by the rolling motion of the pocket in its movement through space, first compressing the leading edge of the briquet as the front edge of the pocket is in the position immediately in line with the axes of the roll, then compressing the rear edges of the briquet as the rear portion of the pocket arrives at this position, thus forcing the briquet against the forward sides of the pocket whose inclination is such as to maintain the shape of the forward end of the briquet and further compressing it and avoiding any tendency for it to split as the forward edges of the pocket begin to open. This we have found in practice produces a briquet of great strength, much greater than if the inclination of the lines 6 and 7 were materially different from 90° to one another.

If the angle between the sides 6 and 6 or 7 and 7 were materially increased over 90°, then the shape of the pocket would be such that the briquets could not be discharged from it without splitting, owing to their tendency to adhere to the leading sides of the pocket which now have a greater inclination or obtuseness; and further, the separating wall 8 between the pockets would necessarily be thinner and would be prone to break in use. These results we have found to be actually so in practice when using a hot mixture of coal-dust and pitch binder.

If the angle between the sides 6 and 7 be materially increased, thus decreasing the angle between the sides 6, 6, and 7, 7, a too shallow and fragile briquet will be produced.

The shape of the briquet illustrated is therefore highly advantageous to produce an article of maximum strength and density and at the same time capable of being formed by the rolls in commercial quantity with the least possible waste of material

passing through them. As shown in Fig. 3, the corners of the united bases are rounded. This is a desirable construction, because it produces a briquet that will free itself from the pocket without breaking.

In accordance with the provisions of the patent statutes, we have described the principle of our invention, together with the apparatus which we now consider to represent the best embodiment thereof; but we desire to have it understood that the apparatus shown is merely illustrative and that the invention may be carried out in other ways.

Having now described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. A briquet formed of compressed pulverulent material, and having the conformation of two truncated pyramids of the same size and shape with integrally united bases.

2. A briquet formed of compressed pulverulent material, and having the conformation of two truncated pyramids of the same size and shape with rectangular bases integrally united.

3. A briquet formed of compressed pulverulent material, and having the conformation of two truncated pyramids of the same size and shape with their bases integrally united, and the truncated ends rounded.

4. A briquet formed of compressed pulverulent material and having the conformation of two truncated pyramids of the same size and shape with rectangular bases integrally united, the truncated ends being rounded.

5. A briquet formed of compressed pulverulent material and having the conformation of two truncated pyramids with rectangular bases integrally united, the sides bearing a relation of approximately ninety degrees to one another.

6. A briquet, formed of compressed pulverulent material and having the conformation of two truncated pyramids of the same size and shape with rectangular bases integrally united, the truncated ends being rounded and the corners also being rounded.

This specification signed and witnessed this 21st day of November, 1912.

ELLSWORTH B. A. ZWOYER.  
ROLLAND A. ZWOYER.

Witnesses:

HOWARD B. PECK,  
THOMAS J. WALLACE, Jr.