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METHOD OF MANUFACTURING BRIQUETTES

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Fig. 1.

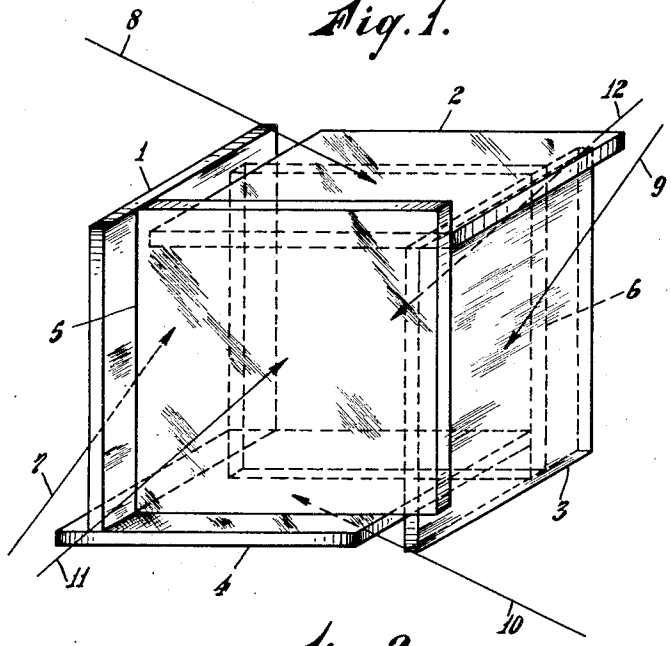
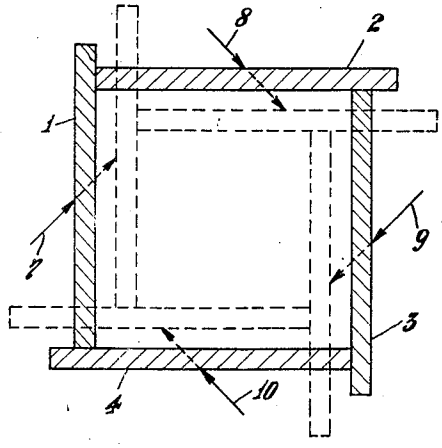


Fig. 2.



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METHOD OF MANUFACTURING BRIQUETTES

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3 Claims. (Cl. 44—10)

The present invention relates to a method of manufacturing briquettes and forms a continuation in part of my copending application Serial No. 737,476 filed July 28, 1934.

In the manufacture of compressed masses or blocks of anthracite dust, lignite dust, coal dust and the like for example in a plunger press, the mass to be compressed in order to form briquettes is subjected to a very high pressure, exceeding 3000 kilograms per square centimeter. In carrying out such a method it has been found that the compressed blocks break up after the maximum pressure has been exerted thereon and when the compression ram, or compression rams, or one or more thereof, has or have been moved back.

In order to avoid this drawback it has already been proposed in the manufacture of briquettes without using a binding agent and by means of a press having a compression chamber and one or more compression rams to relieve the pressure—after the compression has beeen completed—from all surfaces of the compressed mass simultaneously. A satisfactory result however was not obtained by this method.

The present invention is based on the recognition of the fact that even when simultaneously relieving the pressure from the entire surface of the briquettes, the latter still break up because, after the completion of the compression, when relieving the compression on the briquette, the internal tension equilibrium in the briquette is disturbed.

This drawback can be removed to a satisfactory degree by combining with the above described step of simultaneously relieving the pressure from the entire surface of the briquette the step, in which after the compression, the pressure while decreasing is kept equal per unit of surface throughout the entire surface of the briquette.

According to a further development of the invention and for the purpose of obtaining equally good results by carrying out the method in a more simple economic and practical manner by means of a press of simplified and more durable construction it appeared to be possible while relieving the pressure from the entire surface of the briquette to allow certain differences in the pressures per unit of surface, provided said differences do not exceed a magnitude dependent on the nature and the properties of the substance under treatment. The special nature and properties are to be determined for any particular case separately. If, for example, the compression strength of a certain material has a smaller value than the resistance to other loads, care will be taken that during the pressure release the allowed differences in pressure per unit of surface on the various faces of the briquette are kept smaller than said compression strength.

Instead of the compression strength another factor may be determinative for the magnitude not to be exceeded by the difference in the pressure per unit of surface of the substance under treatment, for instance the sheering strength, resilience or work of deformation per unit of volume, etc.

It should be kept in mind that the main characteristic of the invention does not reside in the simultaneous movement of all the compressing members, but in the fact that during the release of the compressing pressure the pressures exerted on each square centimeter of the briquette in the mould are continuously kept equal with regard to each other. It may perhaps be said with regard to known similar methods, that the movement of the compressing members takes place simultaneously, but it cannot be said that during the release of the compression pressure the pressures exerted on each square centimeter of the briquette in the mould are continuously kept equal with regard to each other.

Owing to the acknowledgment of the above mentioned difference in pressure per unit of surface on the various faces of the mass under treatment, it now becomes possible to carry out the method in a press of simple construction.

The above description is taken from the earlier application.

The accompanying drawing illustrates diagrammatically, and by way of example, one embodiment of an apparatus according to the invention.

Figure 1 is a diagrammatic view of the compression plates forming the compression chamber;

Figure 2 is a vertical cross-section of the compression chamber shown in Figure 1 with the enclosing compression plates.

The press, which is shown diagrammatically, comprises six plates 1 to 6, which form a cubical or parallelepiped shaped compression chamber. These plates are mutually so arranged that if moved in the direction of their guides which are provided in the direction of the arrows 7 to 12, that is to say, each parallel to one of the diagonals of the cube, they will always form a cubical or parallelepiped shaped compression chamber, the center of which will always coin-

cide with the center of the compression chamber before the plates are moved. The pressure is thus applied to the briquette on three axes mutually at right-angles.

By interconnecting the driving mechanism of the plates, which may be hydraulic, it is possible to reduce the pressure per unit of surface on the entire surface of the briquette, which is constantly supported on its full surface by the plates, simultaneously uniformly and gradually when relieving the compression, so that the equilibrium of the internal tension of the briquette, during the transfer from the condition under high compression to the condition under atmospheric pressure, is maintained, and still the required liberty of necessary expansion is given to the briquette.

As the briquette is consequently brought from one condition of equilibrium to another without disturbing the equilibrium in the meantime, there will be no reason for the briquette to break up, so that it will be delivered by the press in an unbroken condition.

I claim:

1. A method of manufacturing parallelepiped shaped briquettes from a pulverized material consisting principally of coal dust which comprises, subjecting the pulverized material to a compression pressure to form a briquette, said pressure being applied on each surface of the material simultaneously and in the direction of the diagonal axes of the briquette in such a manner that each unit area of the material is subjected to an equal pressure, and thereafter relieving the pressure from all surfaces of the briquette simultaneously while keeping equal the pressures on each unit area of each surface of the briquette.

2. A method of manufacturing parallelepiped shaped briquettes from normally non-coherent pulverized coal which comprises, arranging the pulverized coal in a parallelepiped shaped mold, translating each face of the mold towards the center of the material in the direction of the diagonal axes of the mold so as to simultaneously subject each unit area of the pulverized coal to a pressure equalling the pressure applied to each other unit area and thus provide a briquette, and thereafter retracting all faces of the mold simultaneously so as to relieve the pressure on all surfaces of the briquettes simultaneously while keeping equal the pressures on each unit area of the surfaces of the briquette.

3. A method of manufacturing cubical shaped briquettes from normally non-coherent powdered coal which comprises, arranging the powdered coal in a cubical shaped mold, translating each face of the mold towards the center of the powdered coal in a direction parallel to one of the diagonal axes of the mold so as to simultaneously subject each unit area of the powdered coal to a pressure equalling that applied to each other unit area to thus provide a compressed briquette, and thereafter retracting all faces of the mold along paths corresponding to said translating movement so as to relieve the pressure from all surfaces of the briquette simultaneously while keeping equal the pressures on each unit area of each surface of the briquette.

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