Aug. 23, 1932. E. E. JONES 1,873,596

COAL BRIQUETTING MACHINE

Filed Jan. 6, 1931 3 Sheets-Sheet 1

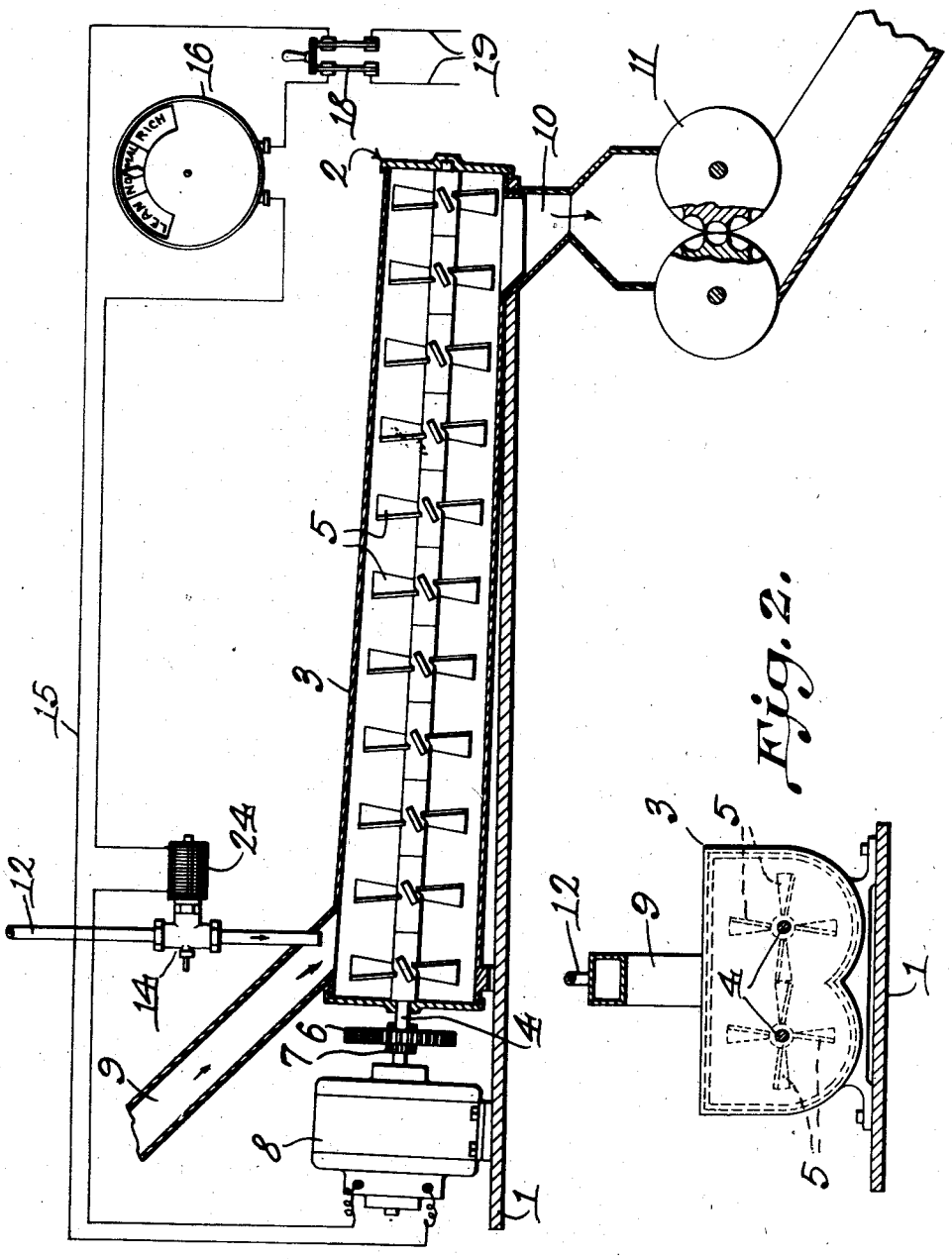


Fig. 1.

Fig. 2.

Emory E. Jones Inventor

By C. A. Snow & Co.

Attorneys.

Aug. 23, 1932. E. E. JONES 1,873,596

COAL BRIQUETTING MACHINE

Filed Jan. 6, 1931 3 Sheets-Sheet 2

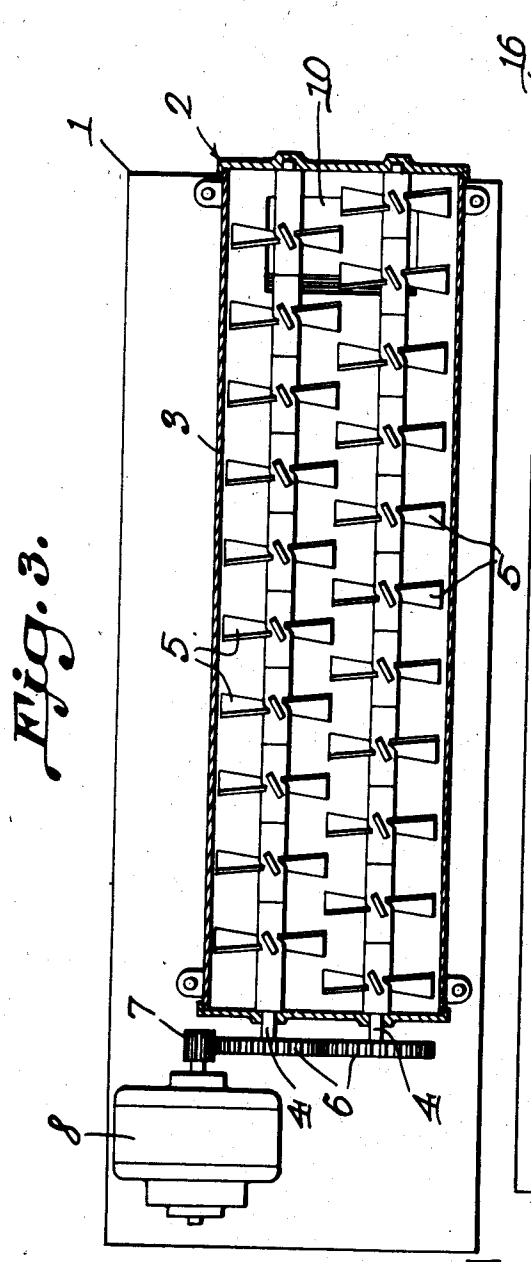


Fig. 3.

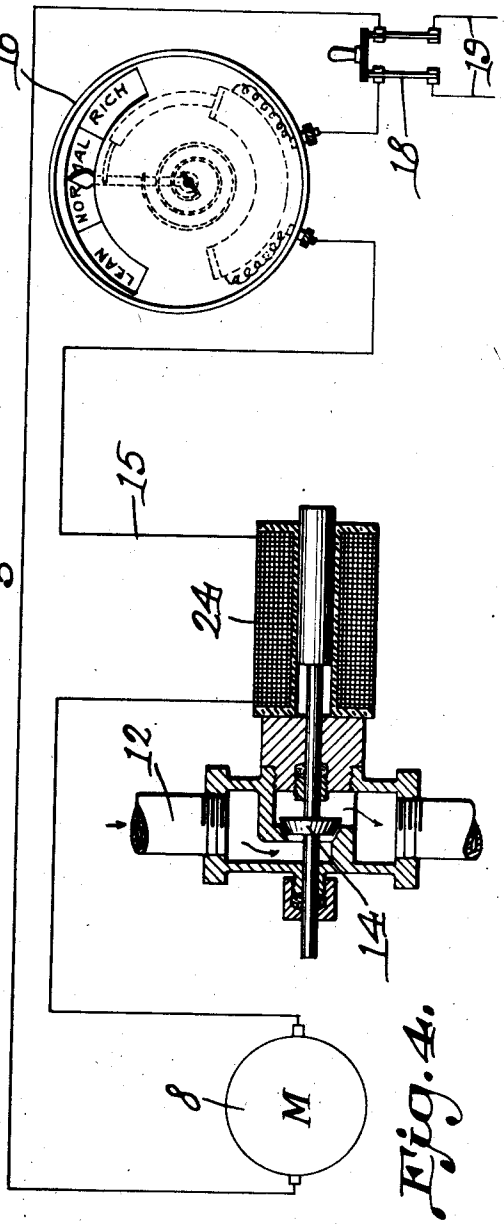


Fig. 4.

Emory E. Jones Inventor

By C. A. Snow & Co.
Attorneys.

Aug. 23, 1932. E. E. JONES 1,873,596

COAL BRIQUETTING MACHINE

Filed Jan. 6, 1931 3 Sheets-Sheet 3

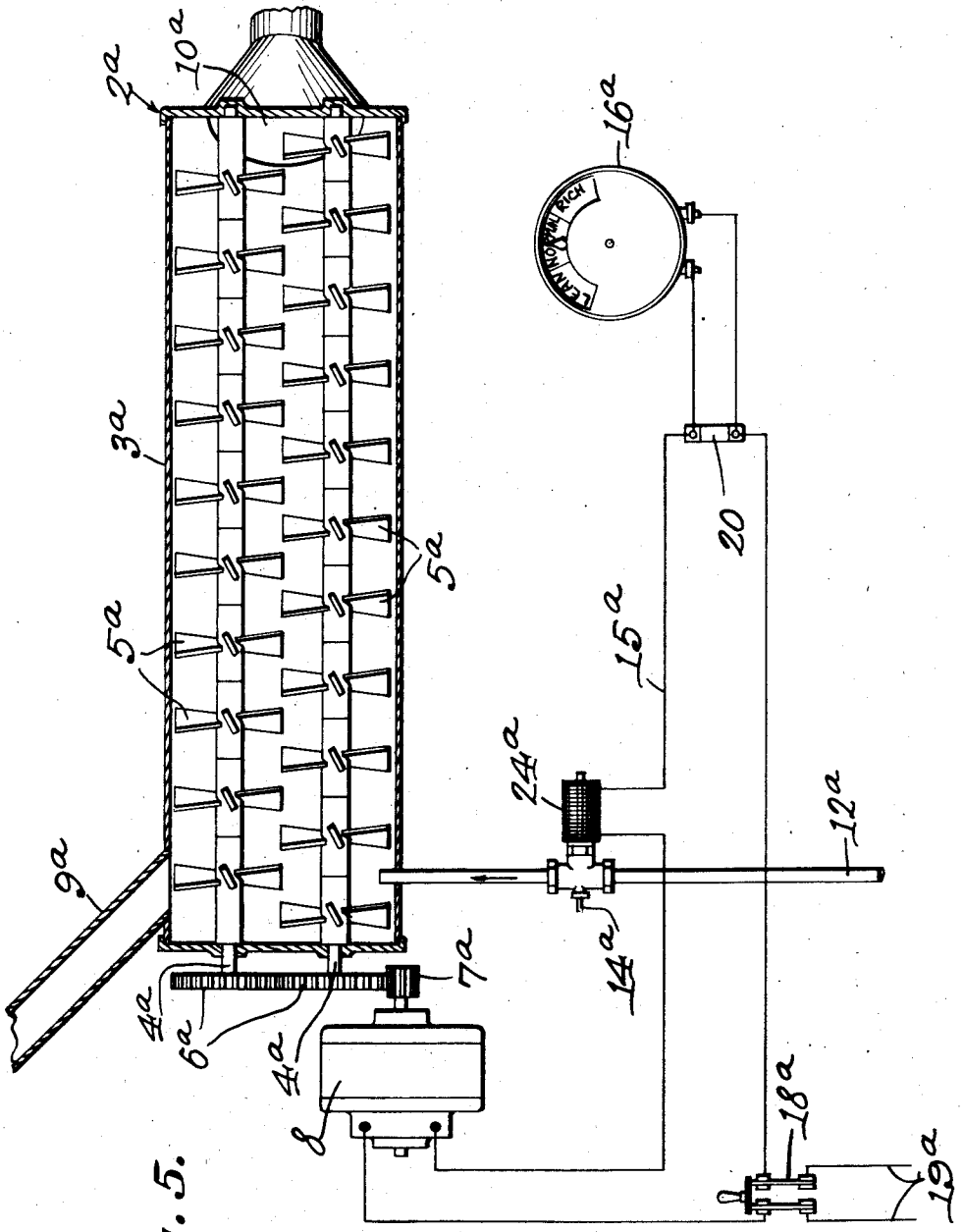


Fig. 5.

Emory E. Jones Inventor

By C. A. Snow & Co.
Attorneys.

Patented Aug. 23, 1932 1,873,596

UNITED STATES PATENT OFFICE

EMORY E. JONES, OF BLUEFIELD, WEST VIRGINIA, ASSIGNOR TO WINDING GULF COLLIERIES, OF BLUEFIELD, WEST VIRGINIA

COAL BRIQUETTING MACHINE

Application filed January 6, 1931. Serial No. 507,022.

In the manufacture of coal briquettes, several operations are involved, among which are drying, crushing, heating, mixing, conditioning and pressing.

The present application has reference to the mixing or fluxing and conditioning of the material. In the operations last above referred to, coal in a more or less finely divided condition is mixed with a binding material, and is stirred by rotating paddles, until a "fluxed" condition is reached. Usually, steam is introduced at this stage to assist in the mixing operation, but since the present invention has nothing to do with the steam control, the steam will be left out of consideration entirely, in the present application.

The mixing or fluxing may be carried out by a mixer, which is driven either by shafting, or by an individual motor. In order to simplify the showing of the drawings, but without prejudice to some other embodiment of the invention which is not shown, the present application will be confined to the type in which an individual motor is used.

During the mixing stage, in any type of paddle mixer, I have observed that the amount of power used varies directly with the amount of binder required, and in order to produce a briquette of uniform character, it is necessary to keep the supply of binder at a constant and predetermined ratio with respect to the coal which is discharged into the mixer, although the actual amount of binder that is supplied, must be changed continually to keep the aforesaid ratio constant.

Since the amount of power varies directly with the amount of binder used, and since it is difficult, if not impossible, under all conditions, for an operator to maintain the binder in proper proportion to the coal, the present invention proposes a means whereby the flow of binder may be regulated automatically; and, especially, to provide a means whereby the flow of binder may be regulated responsive to the changes in the amperage in the current of the motor which operates the paddles of the mixer.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 shows diagrammatically, a device constructed in accordance with the invention, parts being in section;

Figure 2 is a transverse section;

Figure 3 is a horizontal section of the mixer;

Figure 4 is a circuit diagram;

Figure 5 is a section showing a modification.

In Figures 1 to 4, there is shown a base 1, on which is mounted a mixer or pug mill 2, comprising a casing 3, in which parallel shafts 4 are journaled, the shafts carrying mixing paddles 5. By way of illustration, merely, the shafts 4 are shown as being provided with gear wheels 6, one of which meshes with a pinion 7, forming part of an electric motor 8 on the base 1.

The divided coal is delivered into one end of the casing 3 through a chute 9, and the mixture leaves the opposite end of the casing 3 through an outlet 10, and passes thence to the briquette press 11.

A source of supply for binding material discharges into the casing 3, the aforesaid source preferably being a pipe 12 which enters the lower end of the chute 9. The binder is a sticky and combustible substance, and is mixed with the divided coal that enters by way of the chute 9, the mixing taking place in the casing 3, under the influence of the paddles 5, which are operated by the shafts 4, the gear wheels 6, and the pinion 7, from the motor 8.

In the pipe 12 is interposed a valve 14 operated by mechanism shown at 24, and this mechanism is so constructed that it will tend to close the valve 14, as the amperage in the circuit 15 of the motor 8 increases. The circuit 15 is connected by the usual switch 13, or in any other suitable way, to the elec-

tric mains 19. In the circuit 15 is interposed an ammeter 16, which is calibrated to indicate the relative richness of the mixture in the casing 3, that is, the amount of binder that is in the casing 3, considered relatively to the amount of divided coal, at any time during the mixing operation.

As the amount of binder increases, the shafts 4 and the mixing paddles 5, become correspondingly difficult to turn and the amperage in the circuit 15 increases. As the amperage in the circuit 15 increases, the mechanism indicated at 24 operates to move the valve 14 toward closed position and to cut down the amount of binder delivered through the pipe 12. The result is that a uniform briquette is produced, the amount of binder being governed automatically, by the amperage in the circuit 15 of the motor 8. The operator, by glancing at the specially calibrated ammeter 16, may ascertain at any time whether the mixture is lean, normal or rich.

The specific form shown in Figures 1 to 4 need not be rigidly adhered to, and it is impossible to show all of the forms which the invention will take. In Figure 5, however, one modification has been shown. There is a slight change in the arrangement of the gearing 6*a*—7*a*, and in the outlet 10*a*. The binder supply pipe 12*a* is mounted in the casing 3*a*, instead of being mounted in the chute 9, as shown in Figure 1. Moreover, a shunt 20 may be employed in the motor circuit 15*a*. These are matters well within the skill of a mechanic, and they show that the invention is not confined to any one particular form.

Having thus described the invention, what is claimed is:

In the art of continuously forming coal briquettes which are characterized by uniform relative proportions of coal and binder, a casing having an inlet and an outlet, spaced apart, a mixer in the casing and acting as a feeder between the inlet and the outlet, mechanism for operating the mixer, said mechanism including an electric motor, a circuit for the motor, means for supplying divided coal to the mixer, a normally flowing source of binder supply discharging into the casing, at a point closely adjacent to the inlet, an electric valve interposed in the source of binder supply, and operating mechanism for the valve interposed in the circuit of the motor, the valve-operating mechanism being so constructed as to move the valve toward closed position when the amperage of the current in the circuit in the motor increases.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

EMORY E. JONES.