

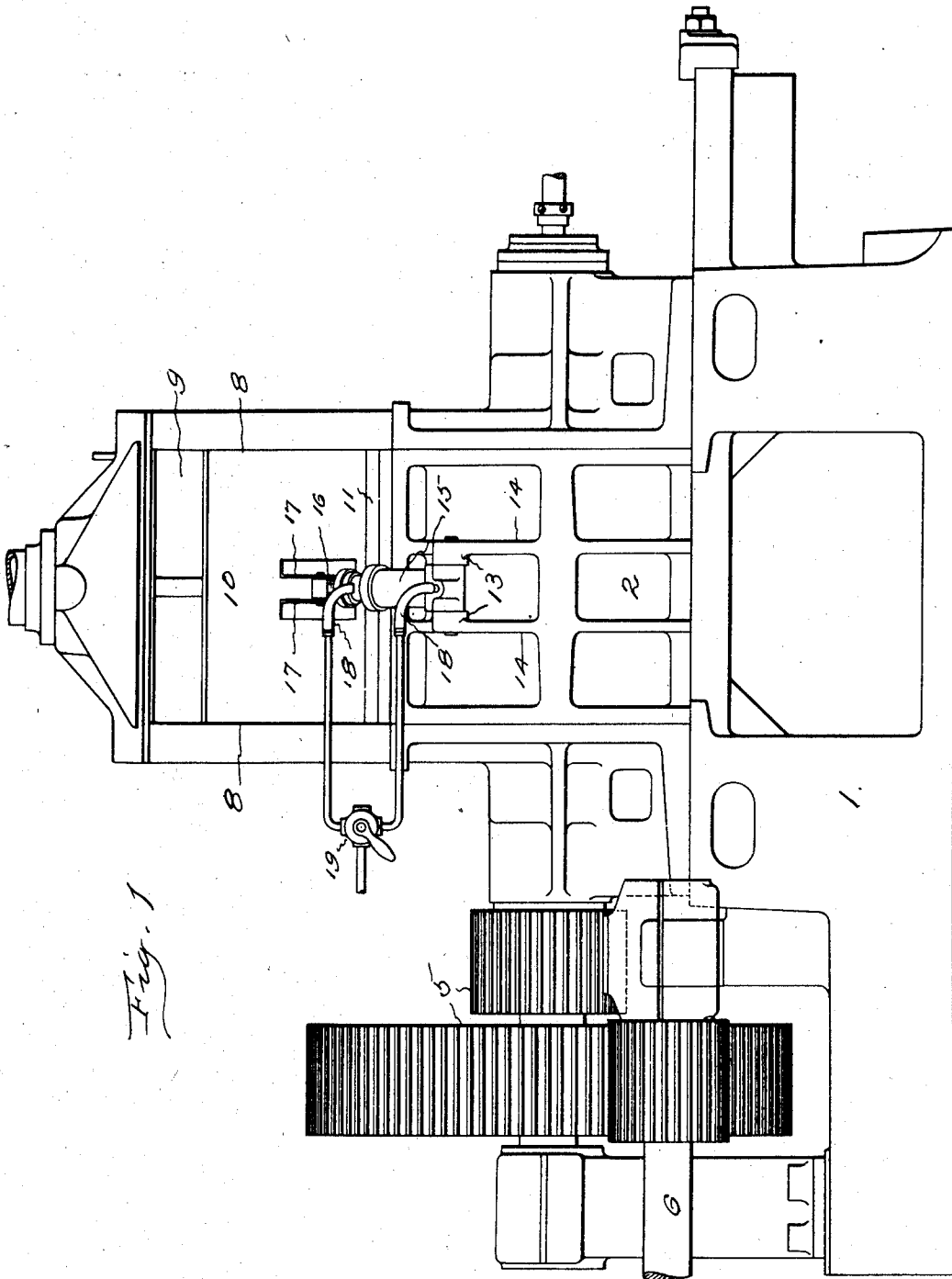
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F. H. BANBURY
RUBBER MIXING MACHINE

Filed Aug. 21, 1926

2 Sheets-Sheet 1



INVENTOR

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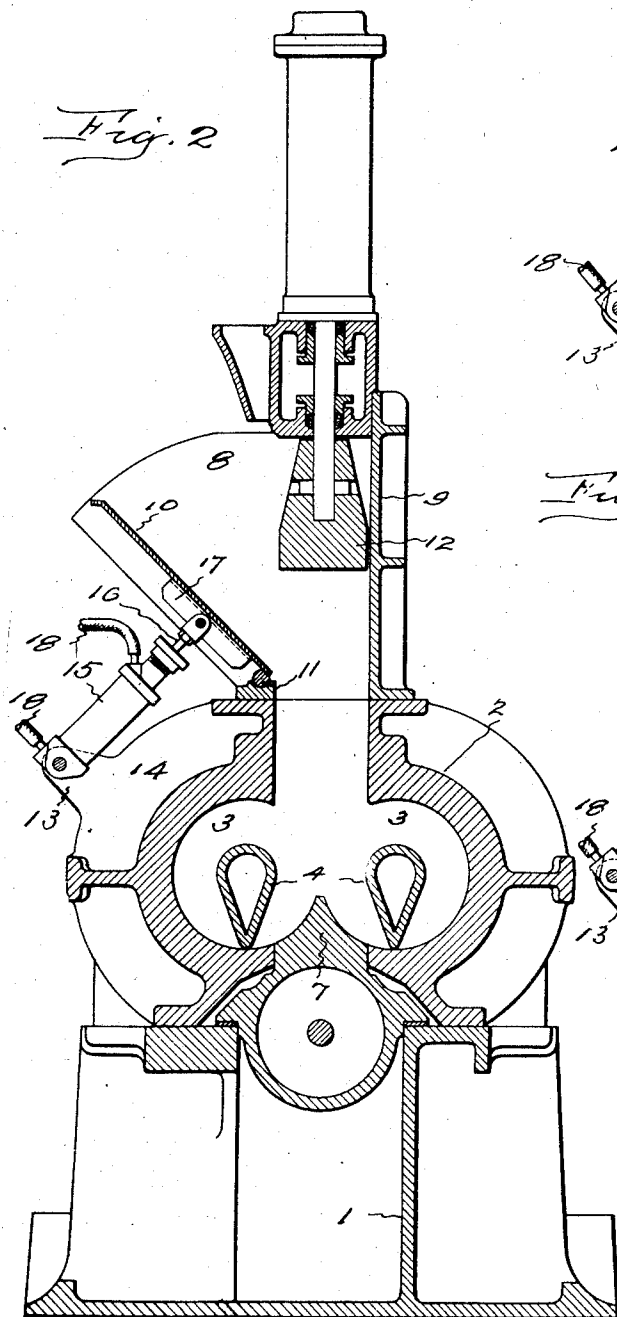
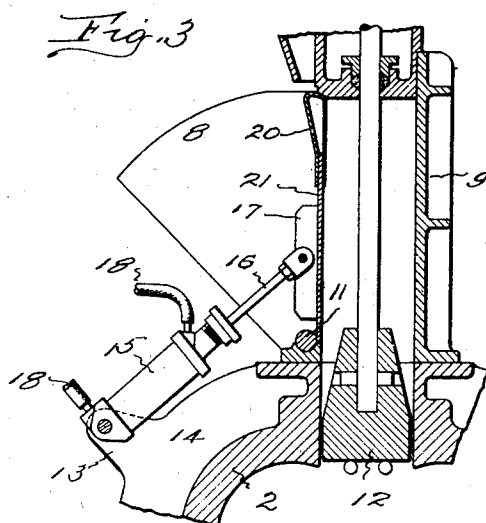
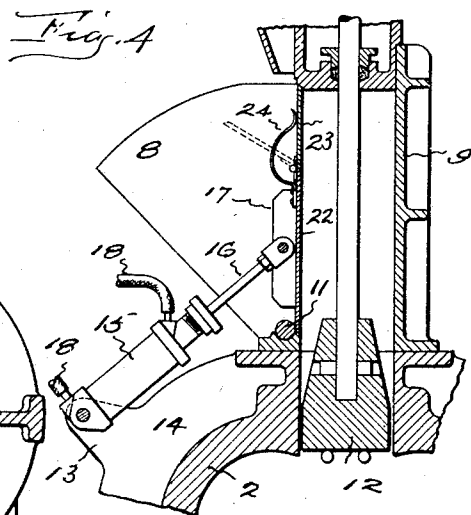
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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RUBBER-MIXING MACHINE.

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This invention relates to those machines for treating plastic material, for instance rubber compounds, of the type illustrated in Patents No. 1,512,813, Oct. 21, 1924 and No. 1,523,387, Jan. 20, 1925, which machines have a casing enclosing one or more cylindrical chambers containing one or more powerfully driven heavy rotors of the character disclosed in Patent No. 1,200,070, Oct. 3, 1916, that are designed to, when in operation, break up, crush, knead and mix such stock as is fed into the casing. In such machines the feed hopper, which is above and at its lower end communicates with the rotor chambers, has a hinged door that is swung outward and downward for opening the hopper to permit the introduction of a charge to be operated upon. When the door is opened the material to be treated is thrown into the hopper and allowed to slide down the door to the rotor chambers, as in a chute. After a complete charge has thus been fed into the hopper the door is closed by swinging it upward and inward. As the door is quite heavy and must be shut tightly, and with the added weight of whatever material the door has to displace and dump into the casing, it requires considerable exertion to close the door. In the machines previously built the closing of such doors has been accomplished by hand.

The object of the present invention is to provide a quick acting power operated door for the feed hopper of such machines.

This object is attained in the embodiment of the invention illustrated by pivotally mounting a cylinder upon the fixed casing which surrounds the rotor chambers, and pivotally connecting the piston of this cylinder with the outside of the hinged hopper door, connections being made to the ends of the cylinder from a source of fluid pressure, preferably air as air pressure is commonly used in operating other parts of such machines, whereby the door may be readily opened or tightly closed by the simple turning of a cock, thus relieving the operator from strain.

In the accompanying drawings Fig. 1 shows an elevation of a rubber mixing machine of the type above mentioned with this invention applied thereto. Fig. 2 shows a vertical section of the machine. Fig. 3 is a vertical section of a part of the machine, showing a modified form of hopper door

which is constructed so as to eliminate danger of accident to the operator. Fig. 4 is a similar view of a different form of safety door.

The machine illustrated has a heavy cast metal bed 1 upon which is mounted a casing 2 containing two rotor chambers 3. The rotors 4 which turn in these chambers and treat the material fed thereto, are driven by suitable gearing 5 from a motor shaft 6. In the under side of the rotor chambers is a sliding door 7 which is adapted to be opened at the proper time for discharging the treated material, as is common in this class of machines.

On the top of the casing is mounted a hopper which has side walls 8, back wall 9 and door 10. The door is hinged at its lower edge 11 to the side walls of the hopper and is designed to swing outward and downward for opening the hopper, as illustrated in Fig. 2, and to swing upward and inward to close the hopper, as illustrated in Figs. 3 and 4. In this type of machines there is usually a power controlled weight 12 that is movable up and down through the hopper to keep the material down in the rotor chambers when it is being treated.

Pivotally mounted between ears 13 extending from webs 14 on the casing is a cylinder 15. The rod 16 of the piston in this cylinder is pivotally connected between ears 17 attached to the outside of the door. Flexible pipe connections 18 are made to the opposite ends of the cylinder from a cock 19 that is connected with any suitable supply of fluid under pressure, as compressed air.

By manipulating this cock air pressure may be admitted to the upper end of the cylinder above the piston in such manner as to cause the door to be swung open, or air pressure may be admitted to the lower end of the cylinder below the piston to cause the door to be swung closed.

By this simple means the heavy door and such material as remains deposited thereon or as the door is required to displace and dump into the casing, can be quickly and tightly closed when the machine is to be operated, or easily opened when a new charge is to be placed in the machine.

The hopper door 10 shown in Fig. 2 is made of one sheet of metal. In the form shown in Fig. 3 a leather, rubber or other flexible strip 20 is fastened to the upper edge of the door

21 so that if the hand or arm of an operative should by any mischance be caught when the door is being closed no serious injury would result. A modification of this safety feature is shown in Fig. 4. In this case the door 22 has hinged to its upper edge a light piece of wood or metal 23 which will yield should an operator's hand be caught when the door is closed. This yielding section of the door may be closed by hand after the main door is shut. Springs 24 may be used to normally keep this yielding section of the door in closed relation to the main door if desired. With these several constructions the hopper door may be opened and closed safely and considerable time and energy is saved in the operation of the machine.

The invention claimed is:

1. A machine of the character described for mixing plastic stock having a casing, a feed

hopper mounted on the casing, a door hinged to and adapted to open and close said hopper, said door having a yielding closing edge, a cylinder and piston operatively connected between said door and the casing, and connections for admitting fluid pressure to said cylinder.

2. A machine of the character described for mixing plastic stock having a casing, a feed hopper mounted on the casing, a sectioned door adapted to open and close said hopper, one section of the door being hinged to the hopper and the other section being flexibly attached to the hinged section, a cylinder and piston operatively connected between the hinged door section and the casing, and connections for admitting fluid pressure to said cylinder.

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