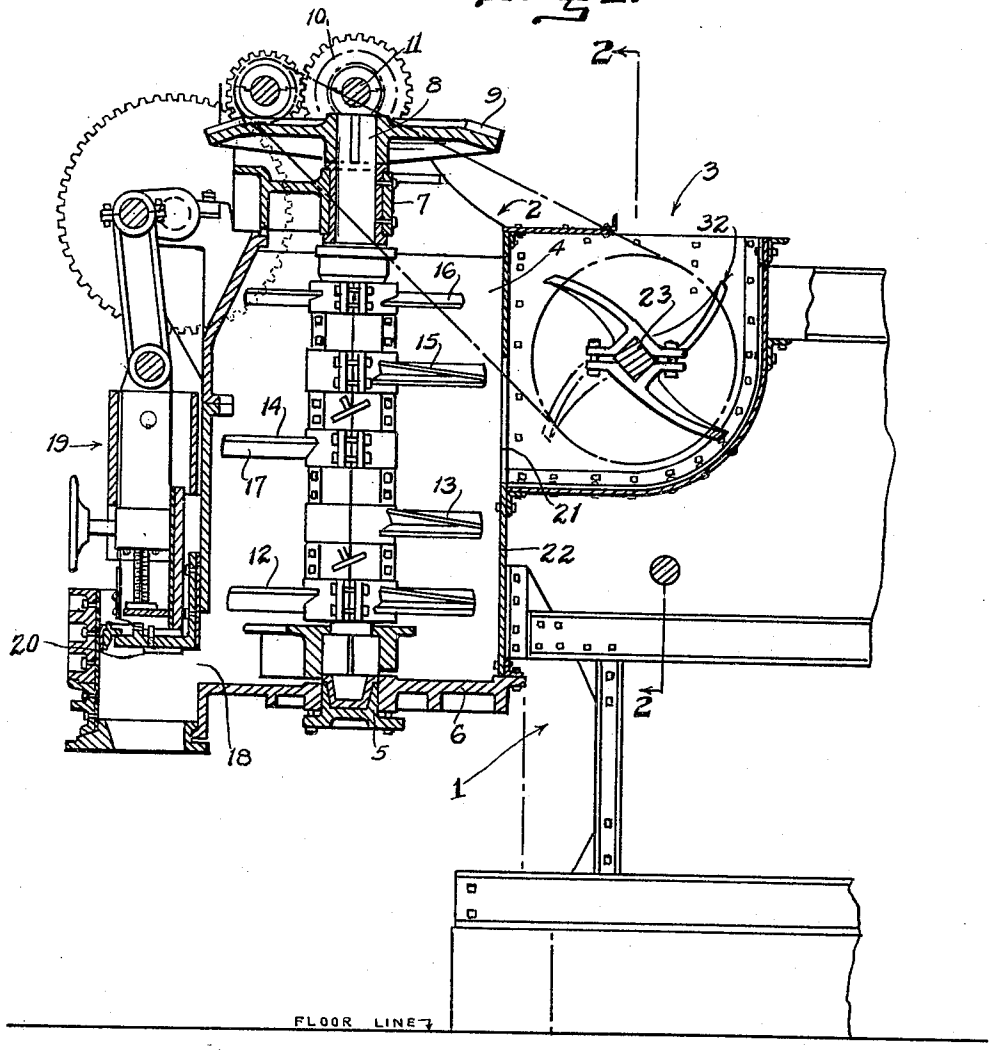
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FEEDER TUB

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Fig. 1.




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Fig. 2.

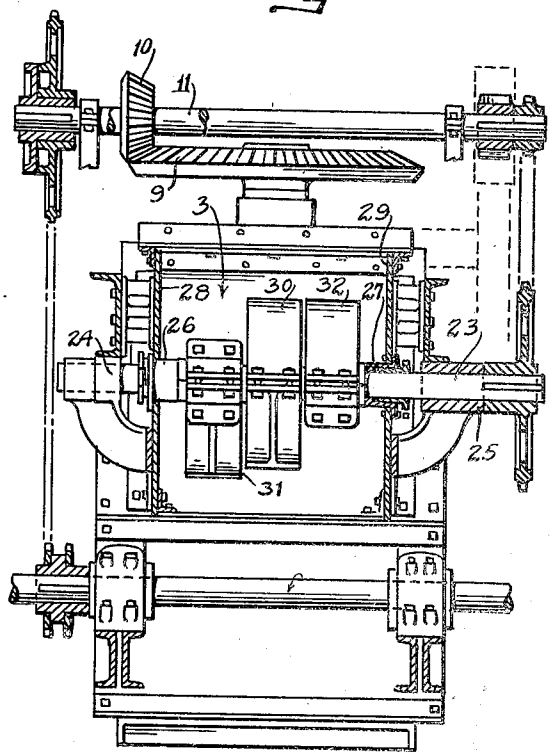
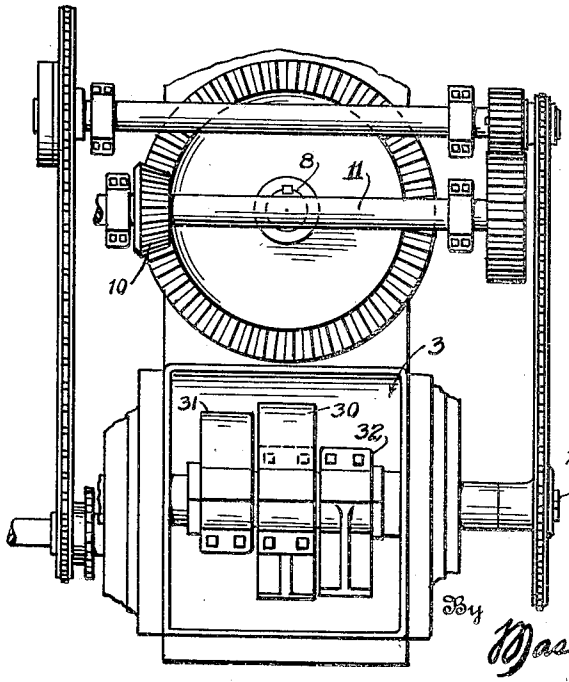



Fig. 3.




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# UNITED STATES PATENT OFFICE

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## FEEDER TUB

Application filed November 12, 1930. Serial No. 495,231.

The invention forming the subject matter of this application relates generally to mechanism for rapidly feeding material, having a tendency to bridge or hang up, from a bin or hopper. The machine is not limited in use to any particular material; it may, for example, be used to feed any solid granular or plastic material, such as sand, wheat, concrete mix or clay from the bottom of a hopper or bin filled with such material.

In the present application the invention is illustrated as combined with the clay feed mechanism of an automatic brick machine such as is disclosed in my U. S. Patent 1,779,136, October 21, 1930.

The machine disclosed in said patent is of the vertical feed type; and the present invention may be added thereto as an additional means for feeding clay horizontally into the vertical feed chamber in the path of the vertically fed column of clay or mud, in order to ensure a positive feed of clay to the press box of the brick machine, and a more thorough mixture of the clay fed thereto.

So far as its application to a brick machine is concerned, the main object of the invention is to provide clay feeding mechanism which will eliminate air pockets in the finished bricks and render such bricks more homogeneous and monolithic than is possible with the older type brick machines.

Another object of the invention is to provide an auxiliary feeder tub with a brick machine of this character in which the lamination ordinarily resulting from the use of a horizontal machine or from a pug mill used with the horizontal machine is practically eliminated by reducing the distance for the thoroughly mixed clay to travel toward the molds.

It must be understood, however, that the feeder tub forming this invention is capable of use independently of any particular machine, and is intended to be so used wherever found necessary or desirable to feed from the lower part of a container any material having a tendency to bridge or hang over the mechanical feeder mechanism in the lower part of such container.

Other objects of the invention will become apparent as the details of description thereof proceeds.

In the drawings:

Figure 1 is a central vertical section through the clay feeding mechanisms, including the present invention, of the improved vertical machine;

Figure 2 is a vertical transverse section taken on the line 2—2 of Figure 1; and

Figure 3 is a plan view of the mechanism shown in Figure 1.

As shown in the drawings, the invention comprises suitable frame work designated generally by the reference numeral 1. In this framework there is arranged a vertical plug mill 2 and a feeder tub 3, the latter feeding into the vertical plug mill between the top and bottom ends thereof. The vertical pug mill consists of a chamber 4 having a step bearing 5 formed in the bottom wall 6 thereof; and having a bearing 7 supported by the framework at the top of said chamber. A vertical shaft 8 is journalled in the said bearing and is provided at its upper end with a large bevel gear 9 meshed with a smaller bevel gear 10, see Figure 3, which is fixed to a horizontal drive shaft 11 rotated by means to be described hereafter.

Suitably spaced apart along the vertical shaft 8 are a series of tempering knives 12, 13, 14, 15 and 16. Each of these knives has a flat face 17 inclined to the horizontal so as to force clay downwardly toward the exit 18 leading to the press box 19 and directly in the path of the press platen 20. As shown clearly in Figure 1, the top knife 16 and bottom knife 12 have blades extending diametrically opposite each other on the vertical shaft 8, while the intermediate knives employ only a single blade extending radially with respect to the vertical shaft 8.

The object of the double knife blade arrangement at the upper end of the vertical pug mill is of course to force the clay or mud as much in a body as possible into the mill as soon as it is fed thereto. The object of the similar arrangemnt at the bottom of the vertical pug mill is to perform the same object on the thoroughly mixed and tempered mud or clay immediately in front of the exit 18 to

the press box. The intermediate single blades are equi-angularly spaced around the vertical shaft 8 and are adapted to permit a comparatively free admission of a horizontal column of clay forced into the vertical pug mill 2 through an entrance 21, formed in the rear wall 22 of the vertical pug mill, by the mechanism operating in the feeder tub 3.

The feed mechanism in the feeder tub 3 comprises a horizontal shaft 23 journalled in suitable bearings 24 and 25 formed in the framework of the machine, suitable packing glands 26 and 27 being mounted on the said shaft to prevent leakage through the side walls 28 and 29 of the tub. A two-blade wiper 30 is fixedly secured to the shaft 23 and centrally between the walls 28 and 29; and single blade wipers 31 and 32 are similarly secured to the shaft 23 and on opposite sides of the wiper 30.

The blades of the wipers are curved so that they force the clay or mud downwardly toward and through the entrance 21 of the vertical pug mill 2. The blades of the center wiper are arranged diametrically opposite each other on the shaft 23, and the blades 31 and 32 are arranged diametrically opposite each other on the shaft 23 on opposite sides of the wiper 30 and at an angle of 90 degrees displacement on said shaft relative to the blades of the wiper 30.

The wiper blade arrangement on the horizontal shaft 23 provides for a turbulence of the clay or mud placed in the horizontal pug mill and thereby assures a thorough mixture of the clay before the horizontal column is forced through the entrance 21 against the vertically descending column of the vertical pug mill 2.

It will be obvious that by forcing a horizontally moving column of clay against the vertically moving column of clay, the two columns interact to break up lamination and air-pockets in the finished brick. Of course a great deal of air is ordinarily eliminated from the finished brick by the valve in the press platen; but the use of the combined vertical and horizontal feeds just described not only eliminates air during the mixture of the clay, but also mixes it so thoroughly that lamination is practically prevented.

It will be evident from the drawing that the double blade wiper at the center of the feeder tub 3 forms a means operable at every passage of the two blades of wiper 30 to force material through the outlet 21. Since there is only one wiper blade on each side of the central two blade wiper, it is obvious that the material on each side of the central two blade wiper will tend to pile up against the single blade wipers; and, in this piling up, will roll over toward and into the central path of the two blade wiper. This roll-over action sets up a lateral as well as downward movement in the material above the wiper mechanism, and prevents the formation of a bridge in such material which would result ordinarily from the use of wipers having an even distribution of wipers throughout the length of the wiper shaft 23.

While the feeder tub 3 is shown in the present drawings as extending slightly above the wiper mechanism, it must be understood that this is for convenience of illustration only. The wiper feed mechanism may be used and is peculiarly adapted to be used, at the bottom of a grain elevator or any other type of high container, to ensure a positive feed of material from that container by eliminating the tendency of the material to bridge or hang over the feeder mechanism.

It must also be understood that while the present invention is illustrated in connection with a vertical type brick machine it is not to be considered as in anyway limited to such use. There is a real combination between the vertical type clay feed and the new feeder tub in machines of this type; and the tub constitutes an element of this combination which is capable of independent use, and will, therefore, be claimed accordingly.

The drive shaft for the entire brick machine is not shown herein. It will be understood however, that suitable driving connections are arranged between the main drive shaft and the shafts 8 and 23 of the vertical pug mill 2 and the feeder tub, respectively, to ensure rotation of both shafts in synchronism.

Wherever the term "clay" is used in the specification or claims, it is to be understood that this is for convenience only and that it may refer to any plastic or granular mass, whatever may be its composition, providing such mass is capable of being operated upon by machines of this character. The term "ribbon", wherever used in the claims, refers to the finished mass of clay as extruded from the machine into the press box of brick machines immediately under the press platen prior to being forced into the molds of the machine.

What I claim is:

1. In a brick machine, framework including a press box having an opening in the path of a press platen, means for forcing a column of clay vertically toward said opening, and means for forcing a mass of clay into and transversely of said column.

2. In a brick machine, framework including a press box having an opening in the path of a press platen, a vertical pug mill formed in said framework and having said opening at the bottom thereof, and a feeder tub formed in said framework and having an opening at the bottom thereof communicating with said vertical pug mill between the ends of the latter.

3. In a brick machine, framework including a press box having an opening in the path

of a press platen, a vertical chamber formed on said framework and having said opening at the bottom thereof, a shaft journalled vertically in said chamber and having knife blades extending radially therefrom, and a feeder tub adjacent said vertical chamber for forcing a mass of clay horizontally toward said vertical shaft and between the ends thereof.

4. In a brick machine, framework including a press box having an opening in the path of a press platen, a vertical chamber formed on said framework and having said opening at the bottom thereof, a shaft journalled vertically in said chamber and having knife blades extending radially therefrom, a chamber extending horizontally from said vertical chamber and having an opening communicating with said vertical chamber between the ends of said shaft, a shaft journalled horizontally in the second named chamber, and wiper blades extending radially from said horizontal shaft.

5. In a brick machine, framework including a press box having an opening in the path of a press platen, a vertical chamber supported or formed on said framework and having said opening at the bottom thereof, a shaft journalled vertically in said chamber and having a series of knife blades spaced apart thereon and adapted to force a column of clay toward said opening, the knife blades at the opposite ends of said shaft extending radially from said shaft and alined in diametrically opposite directions, and the shaft between said ends having single blades extending radially from said shaft, and equiangularly spaced around said shaft.

6. In a brick machine, framework including a press box having an opening in the path of a press platen, a vertical chamber formed on said framework and having said opening at the bottom thereof, a shaft journalled vertically in said chamber and having a series of knife blades spaced apart thereon and adapted to force a column of clay toward said opening, the knife blades at the opposite ends of said shaft extending radially from said shaft and alined in diametrically opposite directions and the shaft between said ends having single blades extending radially from said shaft, the said single blades being equi-angularly spaced around said shaft, and means for forcing a mass of clay toward said vertical shaft between the knife blades at the opposite ends thereof.

7. In a brick machine, a framework including a press box having an opening in the path of a press platen, a vertical chamber supported or formed on said framework and having said opening at the bottom thereof, a shaft journalled vertically in said chamber and having a series of knife blades spaced apart thereon and adapted to force a column of clay toward said opening, the shaft at the opposite ends thereof having the knife blades extending radially from said shaft and alined in diametrically opposite directions and the shaft between said ends having single knife blades extending radially therefrom, the said single blades being equi-angularly spaced around said shaft, a horizontal chamber formed on said framework and having an opening communicating with said vertical chamber between the knife blades on opposite ends of said shaft, a shaft journalled horizontally in said horizontal chamber, and wipers extending radially from the last named shaft.

8. A feeder tub including a chamber having an opening near the bottom thereof, a shaft journalled horizontally in said chamber, a wiper blade at each end of said shaft in said chamber, the blade at one end extending radially and diametrically opposite to the blade at the other end, and a pair of wiper blades fixed on said shaft between the first named wiper blades and radiating in alinement and in diametrically opposite directions.

In testimony whereof I affix my signature.

JAMES P. MARTIN.