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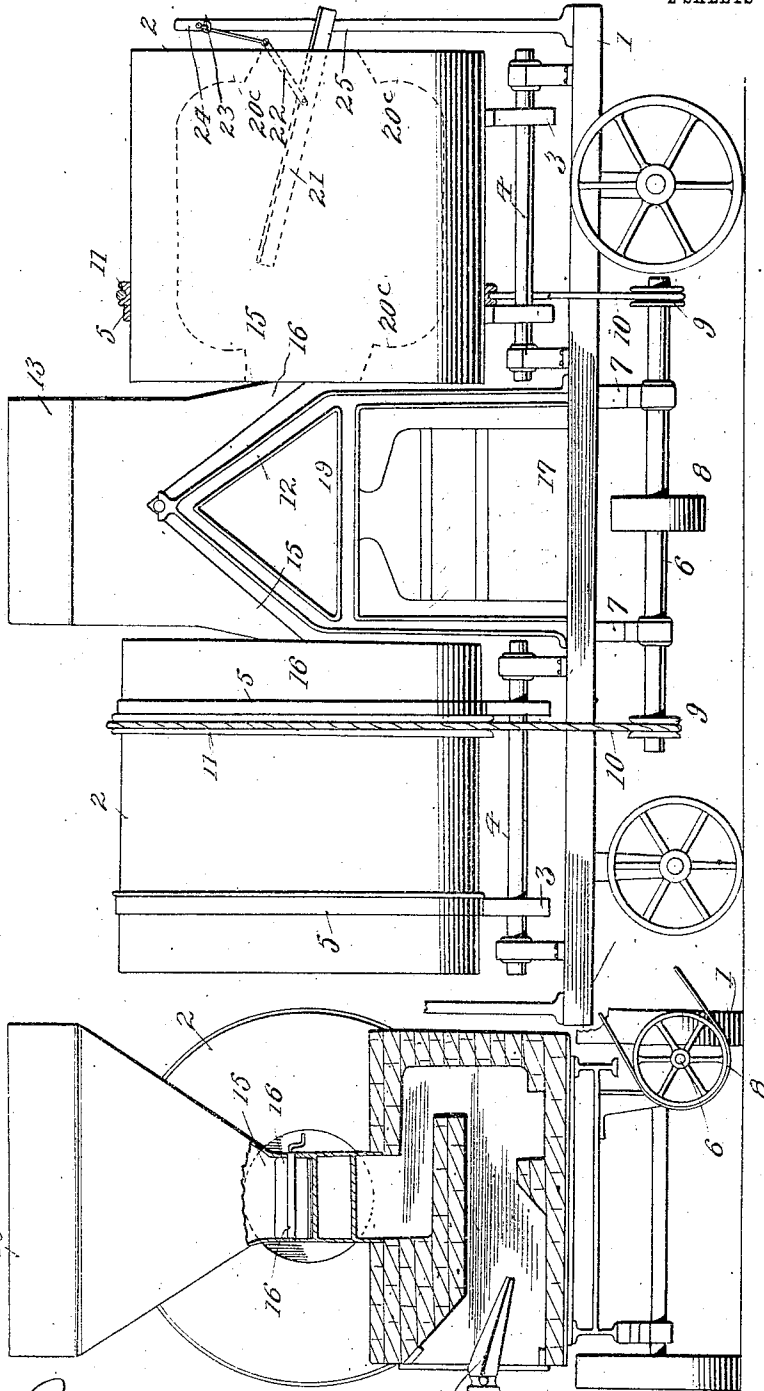


Fig. 2.

Witnesses

Wm 1125365
 R. M. Moore
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Inventor

Henry M Kingsley

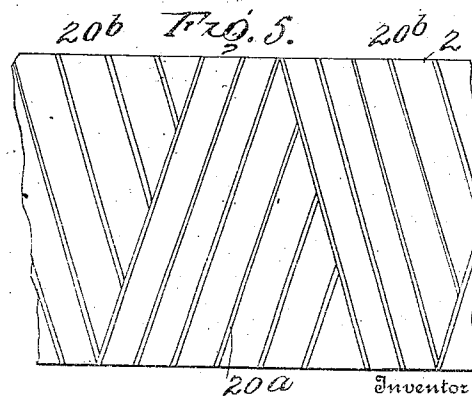
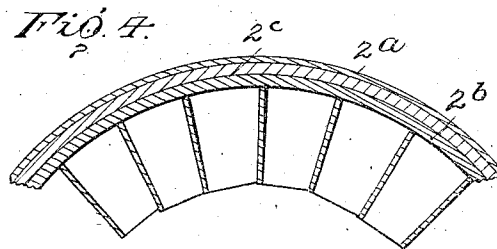
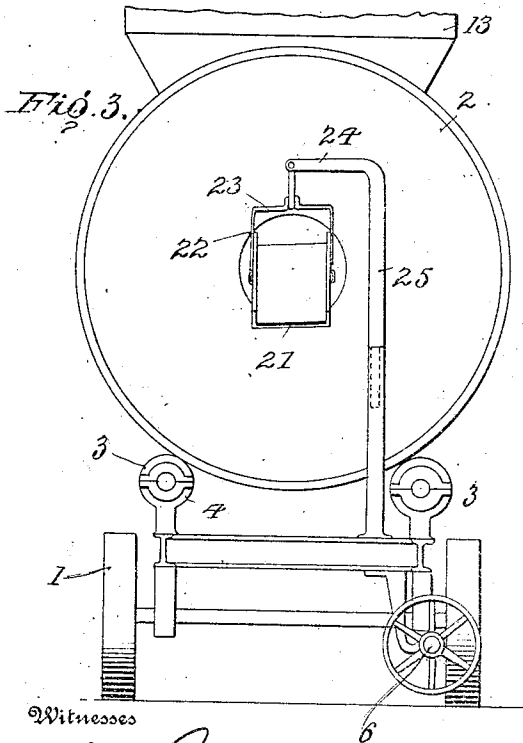
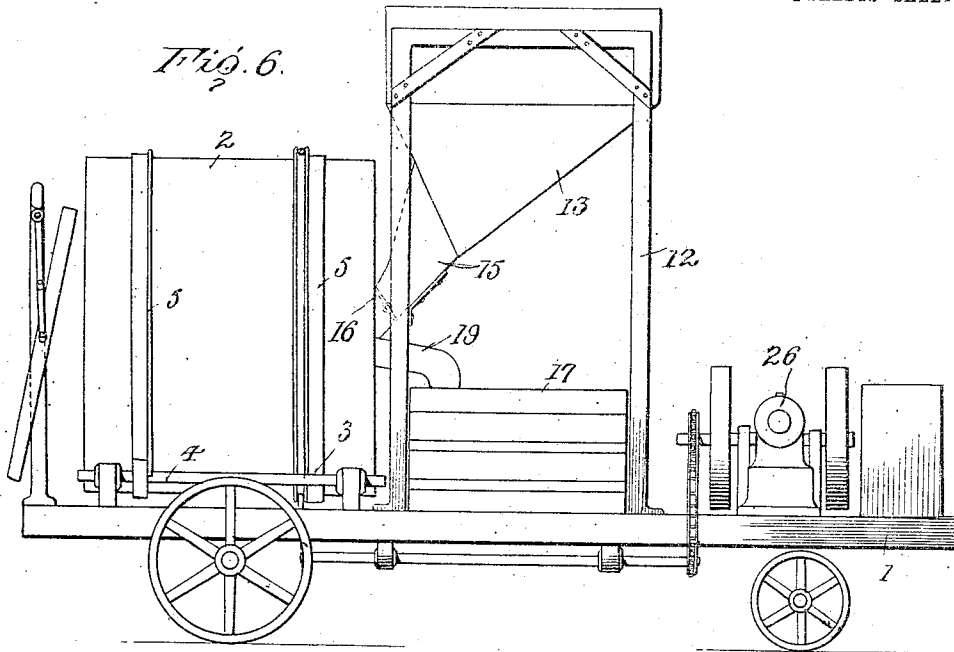
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H. M. KINGSLEY.
 DRYING AND MIXING DEVICE.
 APPLICATION FILED JUNE 29, 1908.

946,699.

Patented Jan. 18, 1910.

2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE.

HENRY M. KINGSLEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

DRYING AND MIXING DEVICE.

946,699.

Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed June 29, 1908. Serial No. 440,990.

To all whom it may concern:

Be it known that I, HENRY M. KINGSLEY, citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Drying and Mixing Devices, of which the following is a specification.

The present invention relates to a novel mechanism for the manufacture of plastic compounds of that type in which it is desired to thoroughly dry the aggregate before adding the binder or cement and in which the binder must be softened and made plastic while mixing by the application of heat.

The object of the invention is the provision of a device of this character which will enable the various ingredients to be discharged into the mixing drum in the required proportions and which will operate in an effective manner to produce a rapid and uniform mixing of the said ingredients.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of the preferred embodiment of the mixing machine, portions being shown in section. Fig. 2 is a vertical transverse sectional view through the same. Fig. 3 is an end view. Fig. 4 is an enlarged transverse sectional view through a portion of one of the mixing drums. Fig. 5 is a plan view showing a portion of the interior of one of the mixing drums developed or unrolled. Fig. 6 is a side elevation of a modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

For the purpose of illustration the mixing and drying plant embodying the present invention is shown as mounted upon the platform of a truck 1 so as to be readily transported from place to place, although it is entirely obvious that should it be found desirable the plant could be mounted upon a stationary base.

As shown in Fig. 1 a mixing drum 2 is mounted upon each end of the truck, the

mixing drums having a substantially cylindrical formation and resting upon the rollers 3 so as to be turned about their longitudinal axes with a comparatively small amount of friction. These rollers 3 are carried by the shafts 4 which are journaled within suitable bearings projecting upwardly from the truck. For the purpose of preventing longitudinal displacement of the mixing drums they are provided upon their exterior with the annular rails 5 which engage the rollers 3. The two mixing drums receive motion from a shaft 6 which is journaled within bearings 7 projecting downwardly from the truck, the shaft being provided with a drive wheel 8 designed to receive power from any suitable source, and also with the pulleys 9 engaging the bands 10 which pass around the mixing drums and are received within the grooved ribs 11 thereon. Mounted upon the truck 1 between the two mixing drums is a frame 12 which supports the hopper 13 from which the materials to be mixed are discharged into the drums. This hopper discharges into the interior of the respective drums through spouts 15 and these spouts lead to openings in the ends of the drums and are provided with valves 16 which enable the required amount of material to be measured in the hoppers and subsequently discharged into the drums by opening the valves. Arranged upon the truck below the frame 12 is a furnace 17 which may be of any suitable type and may employ any desired fuel, either liquid or solid. In the present instance the furnace is provided with a crude oil burner 18 and the heated air enters the mixing drums through passages 19 leading to the openings in the ends of the drum and disposed under the spouts 15 of the hoppers. It will thus be obvious that as the material is discharged into the drum from the hoppers it will be dropped through a current of heated air.

More specifically describing the mixing drums it will be observed from an inspection of Fig. 5 that they are specially constructed so as to retain the heat produced by the furnace and comprise an outer shell 2^a of metal which is separated from the inner shell 2^b of metal by a layer 2^c of asbestos or similar

non-heat conducting material. The interior of each of the drums is also provided with a number of inwardly projecting blades which are arranged at an angle to the longitudinal axis of the drum. These blades are disposed in groups, the blades 20^a of one set of groups being inclined in one direction while the blades 20^b of the opposite set of groups are inclined in an opposite direction. These various groups are arranged alternately with respect to each other and as the drum is revolved tend to cause the ingredients to move toward opposite ends of the drum. It will thus be obvious that during the mixing operation the blades 20^a and 20^b projecting within the drum serve the double function of elevating the ingredients within the drum and dropping them through the heated current of air produced by the furnace and also of moving the ingredients toward opposite ends of the drum as they are acted upon by the successive groups of blades. It may also be mentioned that the end portions of the blades are extended outwardly at 20° to the openings in the opposite ends of the drum, the material being received through one of the openings and discharged through the opposite opening.

For the purpose of discharging the ingredients after they have been thoroughly mixed a chute 21 is provided and this chute is suspended at an intermediate point in its length by means of hangers 22 which are connected to a cross bar 23 carried by an arm 24 projecting laterally from the upper end of a post 25 which is mounted to revolve about a vertical axis. When it is desired to discharge the ingredients from the drum one end of the chute 21 is inserted through the opening in the drum so that as the latter is revolved the blades will elevate the material and drop it upon the chute, the chute being held in an inclined position so that the material deposited thereon may be discharged into a wagon or other suitable receptacle provided for that purpose. After the contents of the drum have been removed the chute 21 is withdrawn therefrom and the post 25 and cross bar 23 are turned so that the chute will hang in an out-of-the-way position.

In the operation of the device the material is placed in the hopper 13 and after being measured therein is permitted to enter the drums. As the drums are revolved the aggregate is successively elevated and dropped through the current of heated air produced by the furnace until thoroughly dried. The binder which may be of a bituminous character and which is subsequently placed in the hopper 13 is then permitted to enter the drums so as to be acted upon by the heat and thoroughly mixed with the aggregate. It will thus be obvious that with the present construction the heat is utilized both

for drying the aggregate and for softening the binder so as to retain the same in a soft and plastic condition during the mixing operation.

A slight modification of the invention is shown in Fig. 6 in which only one of the mixing drums is mounted upon the truck. Upon the opposite end of the truck is arranged an engine 26 which may be utilized for driving the drum, thereby obviating the necessity for deriving power from some exterior source. The manner of operation of this embodiment of the invention is identical with that previously described, the furnace serving to produce a current of heated air through the drum and the aggregate being thoroughly dried by this heated air previous to adding the binder.

I do not herein claim the specific formation of the interior of the mixing drums, nor the manner of discharging the mixing drums, for the reason that this subject matter has been divided out of the present case and constitutes the basis for a co-pending divisional application.

Having thus described the invention, what is claimed as new is:

1. In a device of the character described, the combination of a support, a pair of mixing drums mounted upon the support to rotate about a horizontal axis, the said mixing drums being formed with end openings, a frame projecting upwardly from the support between the mixing drums, a hopper mounted upon the frame and formed with spouts adapted to discharge into either of the mixing drums through the end openings thereof, a furnace mounted under the frame and adapted to cause heated air to enter the mixing drums through the end openings thereof, and means for rotating the mixing drums.

2. In a mixing apparatus, the combination with a wheeled support, of a pair of drums mounted upon the opposite ends of the support in spaced relation to each other, said drums both having a feed opening through their inner ends and outlet openings through their outer ends, means for mutually rotating said drums, a hopper disposed between said drums and having spouts entering the feed openings of both drums, and a furnace located beneath the hopper and heating the same and having opposed flues leading to the feed openings of both drums and located beneath said spouts.

3. A mixing apparatus comprising a wheeled frame, opposed drums rotatably mounted upon the wheeled frame, the inner ends of the drums being toward the middle of the frame, each drum having an inner feed opening and an outer discharge opening, a longitudinal power shaft on the wheeled frame, gearings whereby the drums

may be rotated from the power shaft, a hop-
per mounted between the drums and having
opposed spouts extending into the feed
openings of the opposed drums, a furnace
5 located beneath the hopper to heat the same
and between the drums and having ducts
leading to the feed openings of the drums
beneath said spouts, and means for directing

material contained in the hopper into either
one or both of the spouts as desired. 10

In testimony whereof I affix my signature
in presence of two witnesses.

HENRY M. KINGSLEY. [L. S.]

Witnesses:

JAMES SYKES,

THOS. B. CATCHINGS.