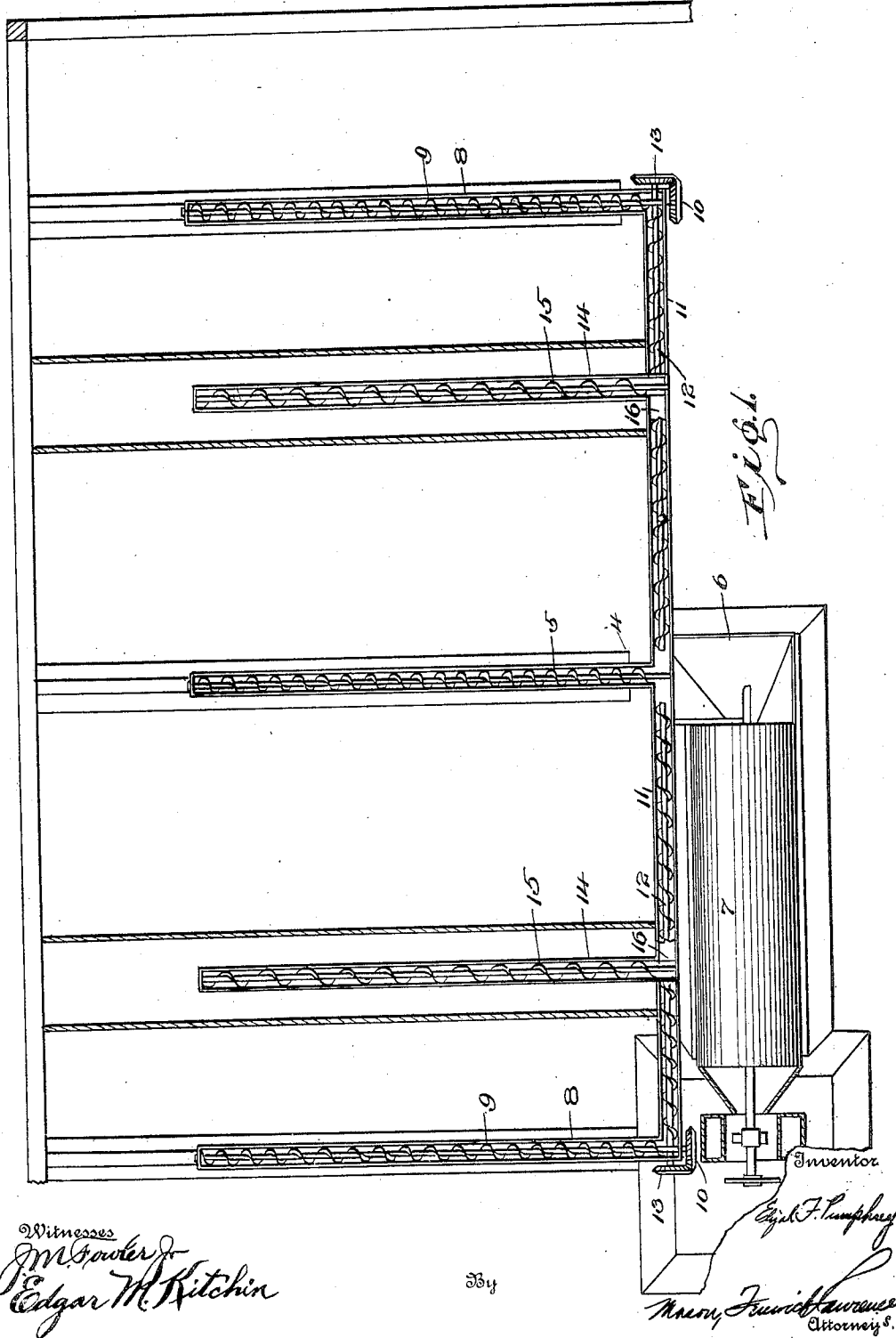


No. 827,664.

PATENTED JULY 31, 1906.

E. F. PUMPHREY.
MIXING MECHANISM.
APPLICATION FILED APR. 6, 1905.

3 SHEETS—SHEET 1.

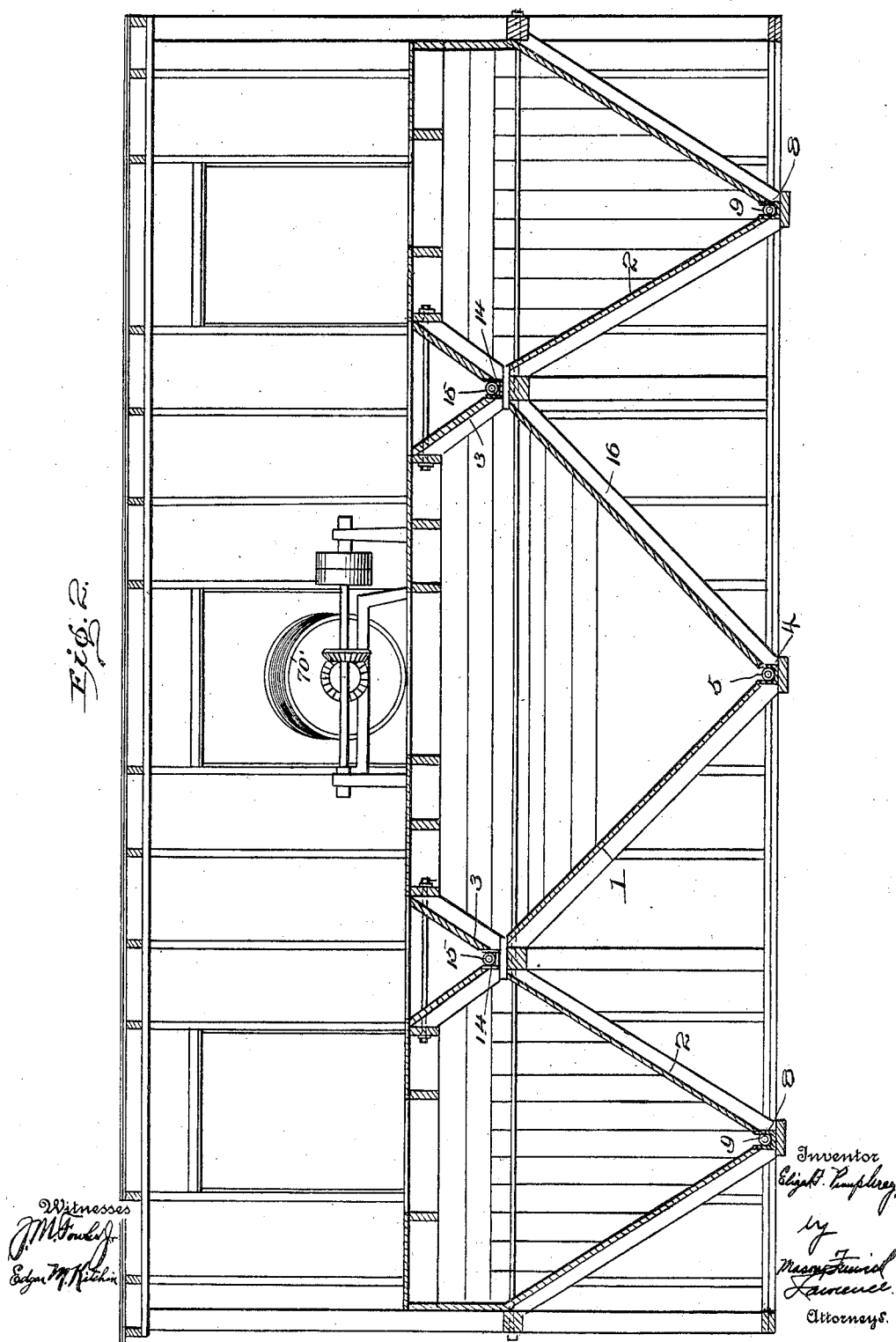


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3 SHEETS—SHEET 2.

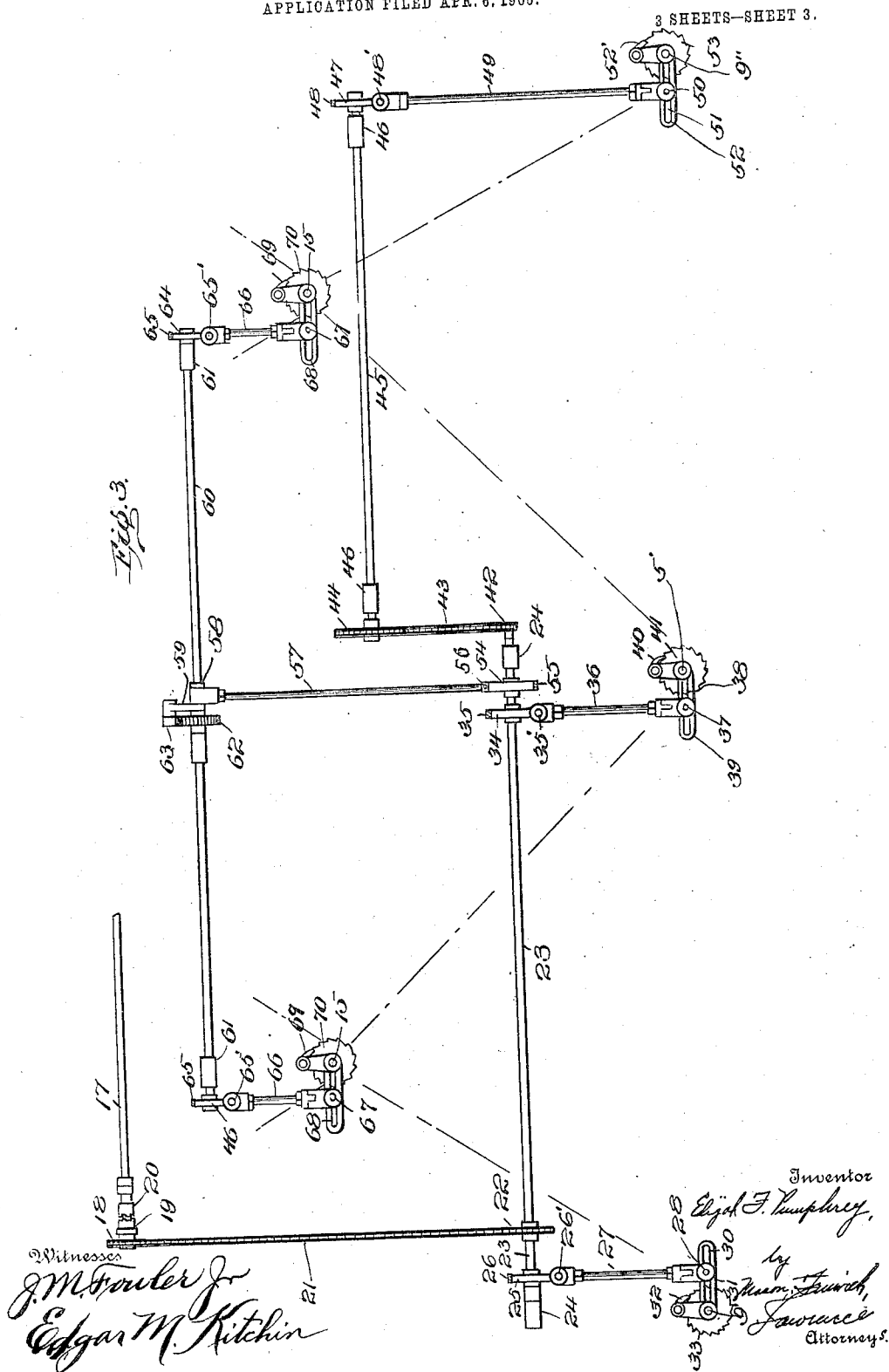


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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ELIJAH F. PUMPHREY, OF OMAHA, NEBRASKA, ASSIGNOR TO THE
WESTERN COMPOSITE BRICK COMPANY, A CORPORATION OF
SOUTH DAKOTA.

MIXING MECHANISM.

No. 827,664.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed April 6, 1905. Serial No. 254,217.

To all whom it may concern:

Be it known that I, ELIJAH F. PUMPHREY, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Mixing Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in feeding apparatus, and is particularly adapted for use in connection with concrete or building-material mixers.

The object in view is the provision of means for feeding given quantities of various materials to a mixing apparatus, means being provided for varying the relative amount of various materials being fed, this and further objects being attained by the employment of means for directing materials to a discharge-point and means for varying the speed of such directing means.

The invention further comprises certain novel constructions, combinations, and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a horizontal section taken through the material-feeding apparatus embodying the features of the present invention. Fig. 2 represents a longitudinal vertical section taken therethrough, parts being shown in elevation. Fig. 3 represents an end elevation of the same, parts being omitted.

In the mixing of materials for concrete blocks or composite bricks of any kind it is of course necessary that the materials employed shall be used in quantities having given fixed relations to each other, and in order to provide for the automatic feeding of various materials to a mixing apparatus for the purpose of accomplishing this and other valuable results I propose to employ a structure such as is disclosed in the accompanying drawings, in which—

1 represents a central bin or hopper adapted to contain one of the materials to be mixed—as, for instance, sand. At each side of the hopper 1 is arranged a preferably smaller hopper 2, the side hoppers 2 being adapted to

contain any other materials preferred—as, for instance, one of said hoppers or bins may be designed to contain cement and the other gypsum or other material. Arranged above the hoppers or bins 1 and 2 are relatively small bins or hoppers 3, adapted to contain, for instance, coloring-matter or other substance, said bins 3 being preferably disposed at the point of junction of the walls of the hoppers 1 and 2. At the lowest point or apex of the hopper 1 is arranged a suitable casing 4, within which is journaled a feed-screw 5, discharging into a hopper 6, the hopper 6 communicating with a mixing-drum 7 of any preferred type. The drum 7 of course may be actuated in any preferred manner for treating the material fed thereto as required, and the material may be further treated after leaving the drum 7, as desired. At the lowermost point of each of the bins 2 is arranged a casing 8, containing a feed-screw 9, said feed-screws having their shafts extending beyond the ends of the casings 8 and carrying beveled gears 10 11. Each of the casings 8 communicates at its discharge end with a casing 11, disposed at right angles to the casing 8 and extending to and discharging at the point of discharge of the casing 4, so that the material being fed by the screws 9 may eventually be deposited in the hopper 6, a feed-screw 12 being arranged in each of the casings 11 for insuring the continuous feed of the material, the shaft of each of the screws 12 extending through the respective casing and carrying a beveled gear 13, meshing with a gear 10, whereby the respective screw 12 is designed to be actuated. At the lowermost point of each of the hoppers 3 is arranged a casing 14, inclosing a feed-screw 15, each of the casings 14 discharging into an inclined casing 16 for directing the material being fed through the casing 14 into the hopper 6.

The shafts of the screws 5, 9, and 15 extend rearwardly through the rear wall of the respective bins and are there provided with actuating mechanism such as is disclosed in Fig. 3. Power is supplied through any suitable power-shaft 17. A sprocket-wheel 18 is loosely mounted on the shaft 17 and carries a clutch member 19, adapted to be engaged by clutch member 20, keyed to the shaft, whereby the sprocket-wheel 18 is

adapted to be rotated. A chain 21 connects the sprocket-wheel 18 with a sprocket-wheel 22, carried by a shaft 23, said shaft 23 being journaled in suitable bearings 24 24, fixed to the rear wall of the hoppers above described. Fixed to the shaft 23 near one end thereof is an eccentric 25, surrounded by a strap 26, pivoted, as at 26', to an actuating-rod 27. The lower end of the rod 27 is provided with a bolt 28, passed through the slot 30 of one arm of a bell-crank lever 31, said lever 31 being pivotally mounted upon the shaft 9' of one of the feed-screws 9, the other arm of the bell-crank lever 31 from that formed with slot 30 being provided with a pivotally-mounted gravity-pawl 32, designed to engage a suitable ratchet-wheel 33, fixed to the shaft 9'. Thus it is to be observed that rotation with the shaft 33 is designed to occasion reciprocation of the rod 27; whereby a rotation of the wheel 33 is accomplished, a step-by-step movement being imparted thereto as the pawl 32 is swung back and forth under the action of the lever 31. It is further to be noted that the speed of rotation of the wheel 33 may be varied according to the position of the bolt 28 in the length of the slot 30, the approach of the bolt toward the pivot of the lever 31 increasing the length of stroke of the arm of lever 31, carrying the pawl 32, and the positioning of the bolt 28 toward the opposite end of the slot 30 decreasing the length of stroke of said pawl. Near the opposite end of the shaft 23 from that carrying eccentric 25 said shaft carries an eccentric 34, surrounded by a strap 35, pivoted at 35' to an actuating-rod 36, the lower end of said rod carrying a bolt 37, passing through the slot 38, formed in a bell-crank lever 39, constructed and arranged like lever 31, a pawl 40 being carried by the short arm of the lever 39 and engaging a ratchet-wheel 41, fixed to the shaft 5' of screw 5, the lever 39 being pivotally mounted on said shaft 5'. A sprocket-wheel 42 is fixed to the shaft 23 and a chain 43 connects said wheel with the sprocket-wheel 44, fixed to a shaft 45, journaled in bearings 46 46, fixed to the rear of the bins above described. At the opposite end of shaft 45 from that carrying sprocket-wheel 44 is arranged an eccentric 47, surrounded by a strap 48, pivoted, as at 48', to an actuating-rod 49, said rod 49 carrying the bolt 50 at its lower end, passed through a slot 51 in the bell-crank lever 52, constructed and arranged similarly to each of the levers 31 and 39, the short arm of the lever 51 carrying the pawl 52', engaging a ratchet-wheel 53, fixed to the shaft 9'' of the screw 9 opposite screw 9, carried by shaft 9'. The lever 52 is pivotally mounted on the shaft 9'' and is adapted to be actuated as described with respect to the levers 31 and 39. An eccentric 54 is fixed to the shaft 23 at any suitable

point and is surrounded by a strap 55, pivoted at 56 to an eccentric shaft 57, being provided at its upper end with the bolt 58, engaging one arm of a bell-crank lever 59, journaled upon a shaft 60. Said shaft 60 is journaled in bearings 61 and fixedly carries a ratchet 62, engaged by a gravity-pawl 63, carried by the free arm of the lever 59. The shaft 57 in operation of course is reciprocated by the eccentric 54 and swings the lever 59 back and forth, causing the pawl 63 to intermittently engage with the ratchet-wheel 62 for driving the same. The connection between bolt 58 and the arm of lever 59 may of course be slotted or pivotal, such connection being preferably pivotal, as a constant speed of rotation is desirable for the shaft 60. The shaft 60 carries at each end an eccentric 64, surrounded by a strap 65, each of said straps being pivoted, as at 65', to an actuating-rod 66, each of said actuating-rods extending downwardly and being connected by a suitable bolt 67 to one arm of the bell-crank lever 68, the arm engaged by the bolt 67 being slotted longitudinally for permitting longitudinally adjustment of the bolt. Each of the levers 68 has its free end pivotally carrying a gravity-pawl 69, engaging a ratchet-wheel 70, fixed to the shaft 15' of the corresponding screw 15, the respective lever 68 being pivoted to the corresponding shaft 15, the construction and operation of each lever 68 being the same as that of lever 31. Thus it will be seen that any required speed within the limits of the slot adjustments may be imparted to the several screws 5, 9, and 15 and all of said screws driven from the same source, the speed of the several screws being easily adjusted and varied as required for the insuring of the supplying of various materials to the drum 7 in the required quantities.

The bins and feeding apparatus above described may of course be positioned within any suitable housing, and any preferred arrangement of screens may be provided for sifting the material supplied to the several hoppers, the material being placed in the hoppers either manually or in any preferred manner. By preference I employ in connection with the hopper 1 a suitable rotary drum-sieve 71, journaled above the hopper 1 and driven from any preferred source of power, material being supplied to said sieve, as far as this invention is concerned, either manually or by any preferred delivering mechanism, (not illustrated,) the material sifting through the drum 71 being free to drop into the hopper 1 through the aperture (indicated in Fig. 2) in the flooring beneath the drum 71.

Assuming the bins 1, 2, and 3 have all been filled, the clutch member 20 is thrown into mesh with clutch member 19, and the chain 21 is thus driven for actuating shaft 23, the

rotation of which shaft through the eccentrics 25 and 34 reciprocates the links or rods 27 and 36. At the same time the eccentric 54 produces reciprocation of the rod 57, which through the lever 59 effects a step-by-step feeding of the ratchet-wheel 62, the shaft 60 being of course correspondingly rotated with a step-by-step movement. The rotation of the shaft 60 through the action of eccentrics 64 reciprocates the rods 66, whereby the levers 68, 39, and 30 are swung upon their pivots and actuate the pawls connected therewith for driving the respective ratchet-wheels engaged by said pawls with a step-by-step movement. At the same time the chain 45 imparts movement from shaft 23 to shaft 45, which latter shaft drives eccentric 47, and thus reciprocates rod 49, which swings lever 52 upon its pivot and causes ratchet 53 to be rotated with a step-by-step movement. Thus all of the screws 5, 9, and 15, are driven, and it will be seen that each is driven at a given ratio with respect to each of the others and that the slot of the actuating-lever enables an adjustment of each of the screw-driving devices, so that any given screw may have its rate of rotation varied to bear any given relation to the rotation of the other screws. Rotation of the screws 5, 9, and 15 will cause the material in the several hoppers to be fed longitudinally of the hopper and deposited in the path of operation of the screws 12, which screws are driven by the shafts of the screws 8 and 9, and said screws 12 thus feed the material delivered thereto longitudinally of their casings to a common discharge-point immediately above the hopper 6, into which such material is delivered. The material delivered to hopper 6 enters drum 7 and is further treated as desired.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a mixing apparatus, the combination with a plurality of bins, and a feed-screw for each of said bins, of a ratchet-wheel fixed to each of said feed-screws, a pawl engaging each of said ratchet-wheels, a lever for each of said pawls, means for swinging some of said levers continuously, and means for swinging other of said levers intermittently.

2. In a mixing apparatus, the combination with a plurality of bins, and a feed-screw for each of said bins, of a ratchet-wheel fixed to each of said feed-screws, a pawl engaging each of said ratchet-wheels, a lever for each of said pawls, means for swinging some of said levers continuously, means for swinging other of said levers intermittently, and means for varying the length of stroke of each of said levers.

3. In a mixing mechanism, the combination with a plurality of bins, and a feed-screw for each of said bins, of a ratchet-wheel connected with each of said feed-screws, for actuating the same, a pawl engaging each of said ratchet-wheels, driving means for said screws arranged transversely of the same, a lever for each of said pawls, an actuating-rod engaging each of said levers, a strap pivotally carried by each of said rods, eccentrics carried by said transverse driving means and inclosed by said straps, and means for rotating said driving means.

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

ELIJAH F. PUMPHREY.

Witnesses:

WILLIAM W. KOLLER,
ADA FINLEY.