C. T. FOOTE.

MIXING MACHINE.

APPLICATION FILED MAR. 30, 1909.

1,025,462.

Patented May 7, 1912.

3 SHEETS—SHEET 1.

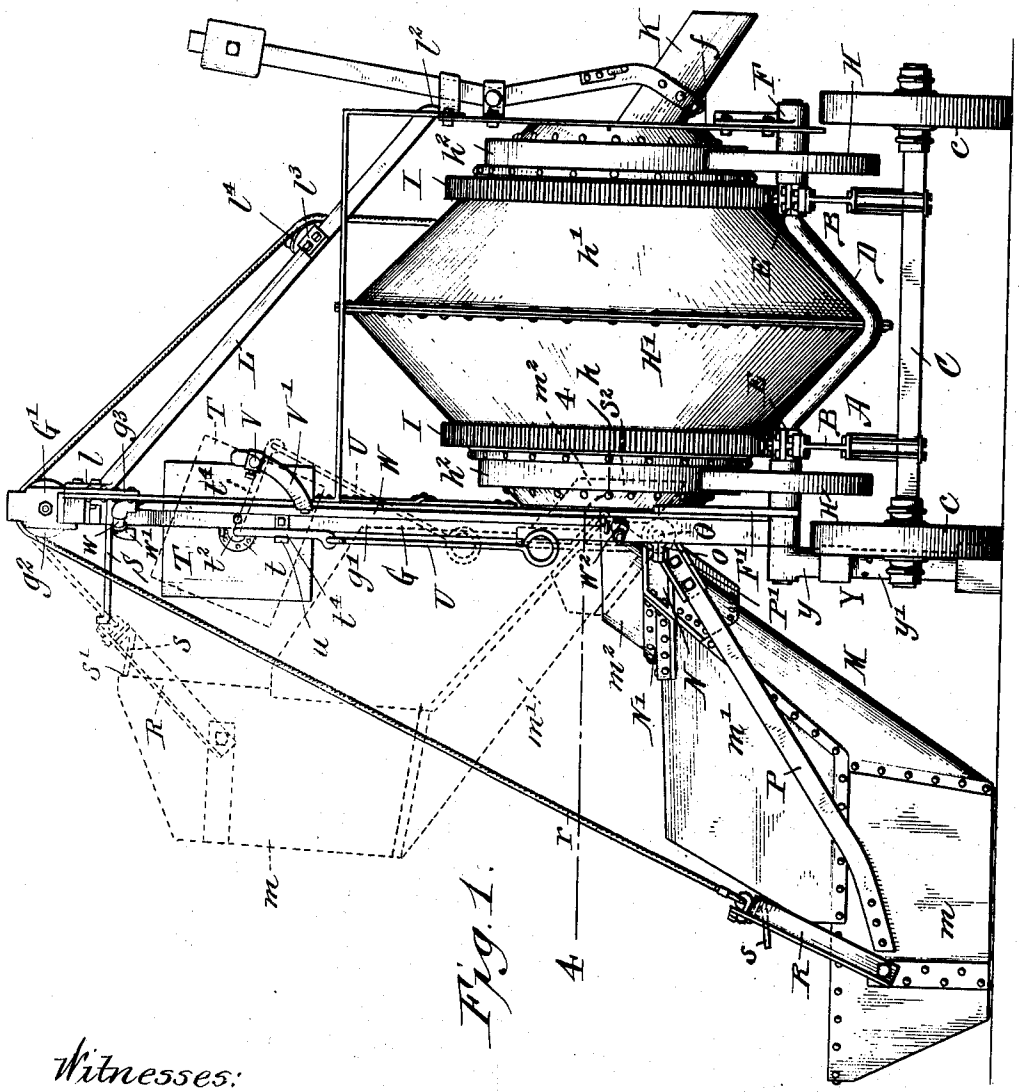

Fig. 1.

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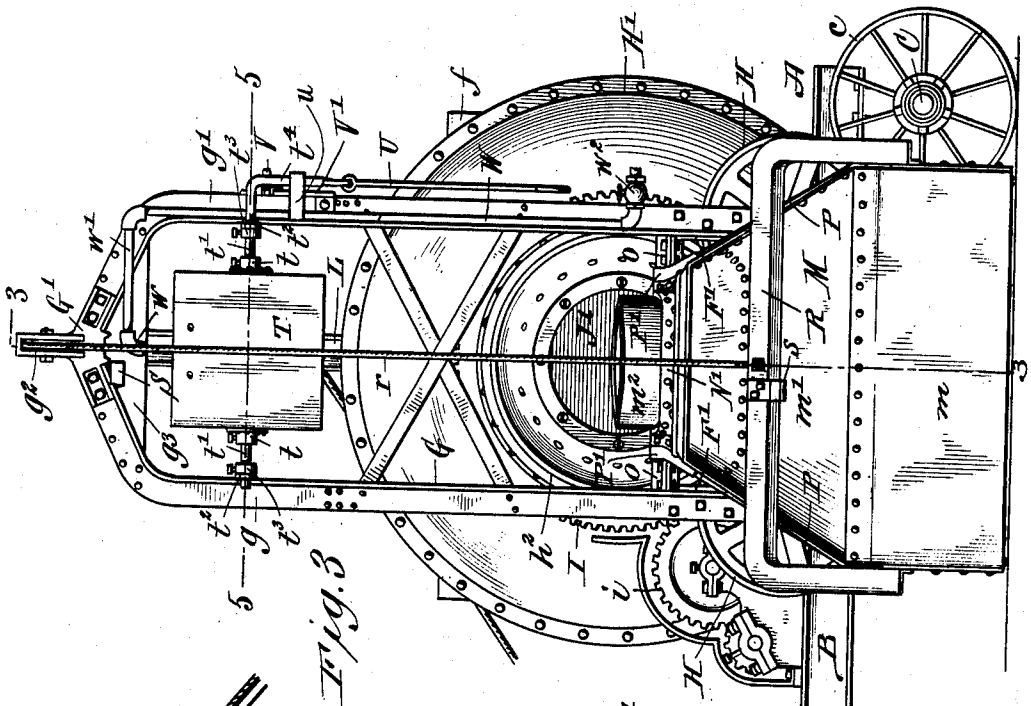

Fig. 3

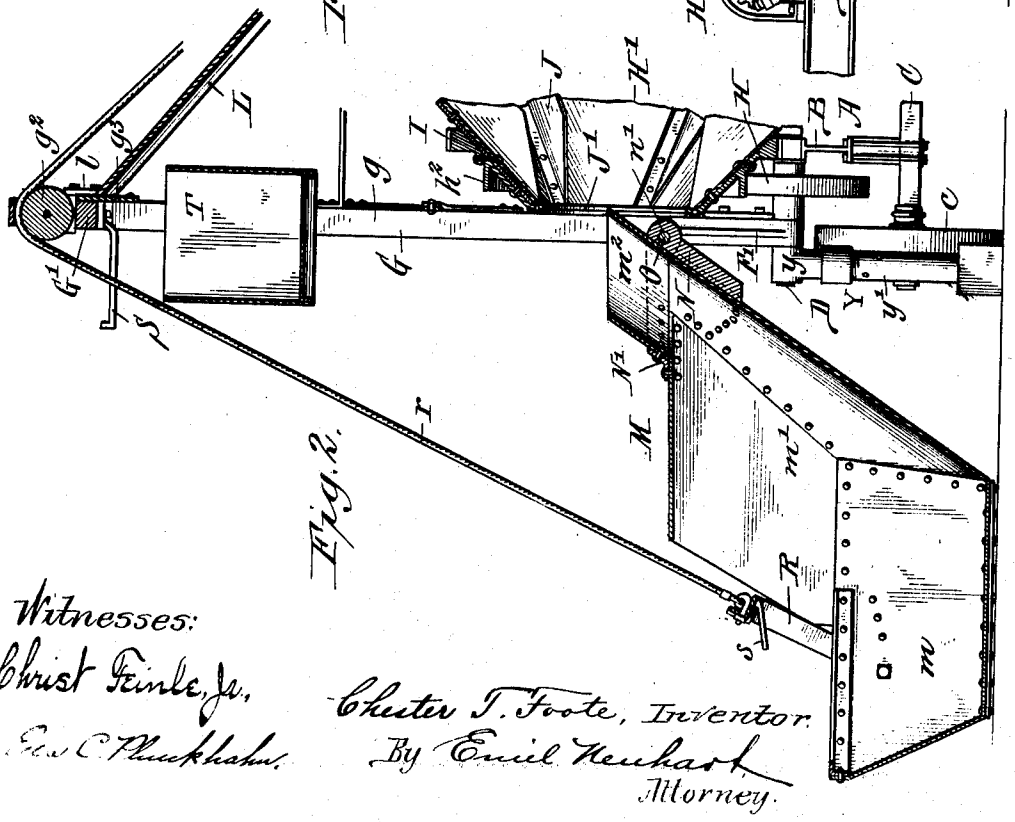

Fig. 2.

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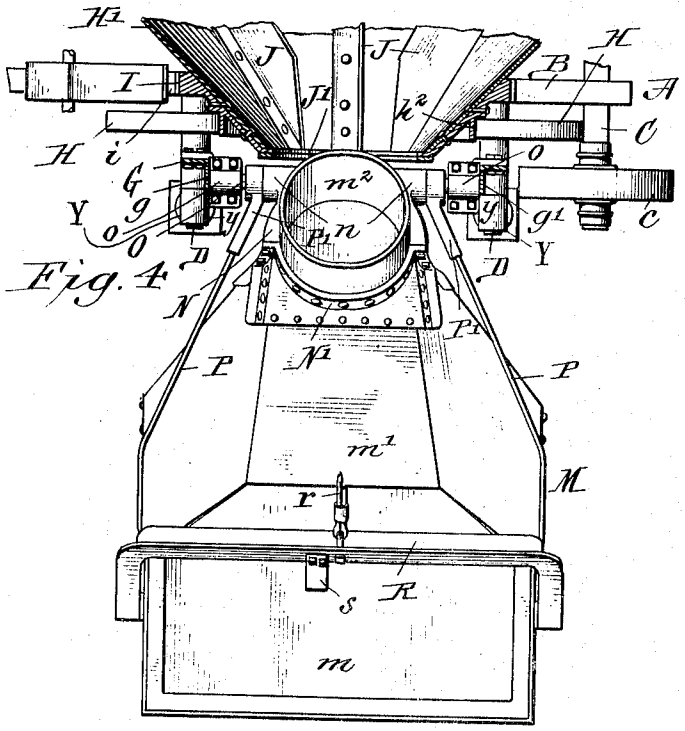

Fig. 4.

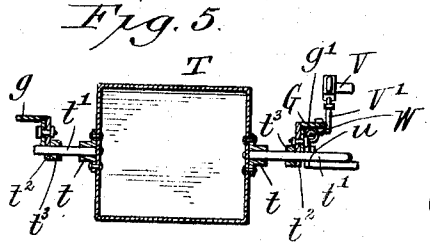

Fig. 5.

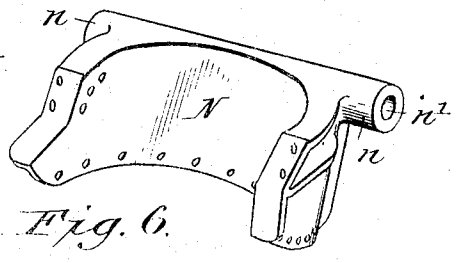

Fig. 6.

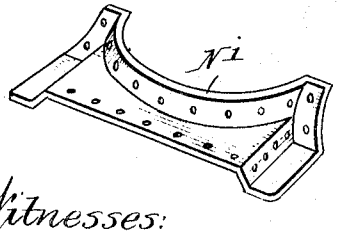

Fig. 7.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHESTER T. FOOTE, OF NUNDA, NEW YORK, ASSIGNOR TO FOOTE MANUFACTURING COMPANY, OF NUNDA, NEW YORK, A COPARTNERSHIP.

MIXING-MACHINE.

1,025,462. Specification of Letters Patent. Patented May 7, 1912.

Application filed March 30, 1909. Serial No. 486,765.

To all whom it may concern:

Be it known that I, CHESTER T. FOOTE, a citizen of the United States, residing at Nunda, in the county of Livingston and State of New York, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a specification.

My invention relates to a machine for mixing two or more materials to form concrete, and it relates more particularly to a batch charging-apparatus into which the materials to be mixed are deposited and from which said materials are delivered to the mixing-mechanism.

My improved charging-apparatus is illustrated in the drawings, which form part of this specification, in conjunction with a batch-mixer, so called on account of mixing a quantity of material and discharging the same previous to the introduction into the mixing-machine of an additional quantity of material.

The object of my invention is the production of an improved charging-apparatus held at a comparatively low point with reference to the position of the charging-opening of the mixing-machine so that the workmen can conveniently shovel or otherwise deliver the material into the apparatus in a quick and convenient manner and without being compelled to lift the material any considerable height from the ground.

With this and other objects in view the invention consists in the construction, arrangement, and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is an end elevation of a complete mixing-machine equipped with my invention. Fig. 2 is a transverse section taken through the charging-apparatus, that portion of the frame to which said apparatus is pivotally secured and the adjacent portion of the mixing-drum; the section being taken on line 2—2, Fig. 3. Fig. 3 is a side elevation of a portion of the mixing-machine. Fig. 4 is a horizontal section taken on line 4—4, Fig. 1. Fig. 5 is a horizontal section taken on line 5—5, Fig. 3. Figs. 6 and 7 are perspective views of the coöperating castings secured to the outlet spout of the charging-apparatus and through one of which the pivot-shaft for said apparatus is passed.

Referring now to the drawings in detail, like letters of reference refer to like parts in the several figures.

A designates the frame of the mixing-machine proper, which comprises longitudinal side beams B of I-formation in cross-section. Said beams may be tied together at the front end of the machine in any practicable manner, and they have their rear ends connected by an axle C on which the rear traction-wheels *c* are mounted. Similar traction-wheels may be provided at the front end of the frame so that the machine can be moved about, as may be desired for convenience in operation.

D designates supporting-bars which are bent into substantially V-shape between their ends and which have alined end portions clamped in boxes E secured to said I-beams; said boxes being of any practicable construction, so long as they serve to securely clamp the bars against rotation. The ends of said supporting-bars have cast supporting-members F, F^1 secured thereto and to the members F, located at one side of the machine, a side plate *f* is secured. To the supporting-members F^1 at the opposite side of the machine an upright frame G is secured on which the charging-apparatus, to be hereinafter described, is supported.

Mounted for rotation on the supporting-bars D between the cast supporting-members F, F^1 and the boxes E are supporting-rollers H on which the mixing-drum H^1 is supported. Said mixing-drum may be of any suitable construction but is herein shown as comprising two oppositely-directed cone-shaped members, *h*, h^1 having circular tracks h^2 which roll upon the supporting-rollers H. The drum is also provided with gear-rims I into which mesh gear-wheels *i* driven by any suitable power-motor and causing the mixing-drum to revolve. Said drum has mixing-wings J secured to the inner side of its conical walls and it has a charging-opening J^1 at one end and a similar opening at its opposite end to permit of discharging the concrete.

K designates a discharge-chute which may be swung into or out of the discharge-opening as may be desired. When swung

into the discharge-opening, as shown in Fig. 1, the material is delivered into the chute and from the same to the ground or into a wheel-barrow or other receptacle placed beneath it.

The upright supporting frame G is preferably constructed of two members g, g^1 formed of angle-iron and bent inward at their upper ends where they are connected together by a casting G^1 having a pulley g^2 rotatable therein, and in addition to said casting G^1 the upper ends of said members g, g^1 are tied together by a tie-plate g^3. The upper end of the supporting-frame G is braced by an inclined bar L having one end secured to said tie-plate, as at l, and its other end secured to the side plate f, as at l^2, and it has secured thereto a casting l^3 on which is rotatably mounted a pulley l^4.

Pivotally secured to the upright supporting-frame G at a fixed point is a charging-hopper M comprising a substantially rectangular box-like material-receiving portion m, a hopper-portion m^1 at the rear end of said box-like portion, and a discharge spout m^2 at the small end of said hopper portion. Said charging-hopper has a yoke-like casting N secured thereto at a point where the hopper-portion m^1 meets the spout-portion m^2, and secured to said yoke-like casting is a substantially semi-circular tie-member N^1 which also serves to secure the spout m^2 to the hopper-portion m^1 of the charging-hopper. The yoke-like casting N has two opposite bosses n and it is bored through centrally of said bosses, as at n^1, to receive a pivot-bolt or shaft O journaled in bearing-boxes o at the upper ends of the supporting-members F^1.

For the purpose of bracing the hopper and relieving the yoke-like casting N of strain when swinging the charging-hopper upward into the position shown with dotted lines in Fig. 1, inclined tie-bars P are provided which have their outer ends secured to the side walls of the rectangular portion m and their inner ends secured to castings P^1 located between the yoke-like casting N and the bearing-boxes o and having the pivot-pin or shaft O passed therethrough. Said tie-bars diverge from their points of connection to the castings P^1 and therefore prevent lateral swaying of the charging hopper in addition to relieving the yoke-like casting N of strain when elevating the hopper.

As best shown in Fig. 2, the large end of the hopper-portion m^1 is open and serves as a hood for the rear part of the rectangular-portion m, which latter is open at the top to conveniently receive the materials to be delivered to the mixing-drum through said hopper portion. Said rectangular portion m serves as an extension of the hopper-portion and may well be termed a receiving-bucket in which the material is temporarily held and which, upon swinging the charging-hopper upward, will deliver said material into the hopper-portion m^1 and cause the same to be delivered from the discharge or delivery-spout m^2 into the mixing-drum.

When the charging-hopper is lowered or in receiving position the receiving bucket or rectangular-portion m is in a substantially horizontal position and the hopper-portion and spout are in an inverted position. For the purpose of elevating said charging-hopper or moving the same into charging position a bail R is pivotally attached to the bucket-portion thereof and has one end of a cable r secured thereto which passes upward over the pulley g^2 at the upper end of the supporting frame G, thence downward and around the pulley l^4 on the brace-bar L, and thence to a suitable hoisting-machine located on the frame A of the mixing-machine, or at any other point.

The materials or ingredients to be mixed are shoveled or otherwise deposited into the receiving bucket m of the charging-hopper when said hopper is in lowered position and when the materials are deposited in said bucket in proper quantities and proportions, the hoisting-machine will be operated to draw the hopper upward by the cable r. During this upward movement the bail R swings upon its pivots and comes in contact with a stop-bar S extending outward from the upper end of the supporting-frame G, thus limiting the upward movement of the hopper; and for the purpose of holding the hopper steady while in elevated position, a stop s is secured to the bail and is engaged by the hopper, as shown in dotted lines at s^1, Fig. 1.

During the upward movement of the charging-hopper, the materials are delivered from the receiving-bucket m thereof into the hopper-portion m^1, and the position of the hopper-portion m^1, as it passes above the horizontal plane in which the pivot-shaft O is located, causes the materials to be crowded toward the charging or delivery spout m^2, which latter has been moved to extend into the mixing-drum, as clearly shown at s^2, in Fig. 1, and from said spout, the materials are charged into the mixing-drum.

In order that the materials in the charging-hopper may be delivered to the mixing-drum in a wet condition, a water-tank or bucket T is provided and is so arranged that it may be tilted to any extent desired for the purpose of delivering water therefrom in measured quantities into the charging-hopper when elevated. At opposite sides of this water-bucket, two hollow castings t are secured into which are fastened spindles t^1 passing through brackets t^2 secured to the upright members of the supporting frame G; and to prevent lateral movement of said bucket, each of said spindles has a collar t^3

secured thereto which bears against the inner side of the adjacent bracket through which the spindle passes. Said spindles rock within the brackets t^2 and one of the spindles terminates in a crank-arm t^4, to the outer end of which is secured a rod U adapted to be forced upward for the purpose of swinging the crank-arm through an arc of a circle and thus cause the water-bucket to be tilted.

In order to prevent tilting of the water-bucket in the wrong direction, the crank-arm t^4 is permitted to swing in one direction only and for this purpose a stop u is provided which extends outward from the supporting frame G and against which the crank-arm t^4 bears when in normal position. The extent to which the water-bucket is tilted is regulated by a stop V adjustable on a segment or curved rod V^1 and adapted to limit the swinging movement of the crank-arm. The extent to which the crank-arm is swung upward governs the amount of water discharged from the bucket and the bucket can only be drained of its entire contents when its outer wall is swung into or inclined below the horizontal.

In order to supply the water bucket with water as it is needed, a water-pipe W, supplied with water in any suitable manner extends upward along one of the upper members of the frame G and has at its upper end a horizontal portion w which is provided with a down-spout w^1 located directly above the water-bucket. Said water-pipe is provided with a hand-valve w^2 within convenient reach of the operator so that he may conveniently supply water to the bucket and shut-off the same when the desired quantity is supplied.

For the purpose of determining when to shut-off the supply of water to the bucket, the latter is provided in one of its walls with a number of perforations near the upper edge of said wall, so that when the water reaches the height of the perforations, it issues through said perforations to inform the operator that the proper quantity of water has been supplied.

The ends of the supporting rods D on the charging side of the mixing-machine have props Y secured thereto, each of which consists of an upper member y into which the end of the supporting rod is placed and a lower member y^1 having its upper end threaded into the lower end of said upper member and by reason of the threaded connection of said members, said props are extensible and relieve the supporting-castings F^1 of considerable strain.

When the parts are in the position shown in Fig. 1 the materials such as sand, cement, crushed stone or the like, may be shoveled into the bucket-portion m of the charging-hopper and after the materials are thoroughly mixed and discharged from the mixing-drum, the cable r is drawn upon by a suitable hoisting-machine to cause the charging-hopper to swing upward through an arc of a circle and assume the position shown in dotted lines in said figure. As soon as the hopper reaches the limit of its upward movement, the operator takes hold of the rod U to cause the water-bucket to be swung from the position shown in full lines to that shown in dotted lines, thereby causing the water within said bucket to be poured into the charging-hopper for thoroughly wetting the material being delivered therefrom, and from said hopper the water flows into the mixing-drum to thoroughly wet the portions of the material that may have been delivered into the drum during the upward swinging movement of said charging-hopper. Upon releasing the rod U the water-bucket will swing into normal position, after which the cable r is paid out to permit the charging-hopper to gravitate and swing with its large or receiving end against the ground for another refilling. Meanwhile, the drum continues to rotate and thoroughly mix the materials preparatory to discharging the same from the drum in any suitable manner.

The discharge-chute K illustrated is clearly described in a co-pending application filed August 21, 1907, and given Serial No. 389,551, said chute being arranged to swing into or out of the discharge-opening of the mixing-drum and when swung into the drum, as shown in Fig. 1, the materials, during the course of their being mixed, fall into the chute and from the latter are delivered to the ground or into a wheel-barrow or other receptacle placed beneath the projecting end of the chute. When said chute is swung outward, the inner end thereof is swung clear of the material being mixed so that a continuous discharge of the material is not possible.

After the materials are discharged from the mixing-drum by means of the chute K the hopper will have been supplied with the desired quantity and proportions of material and is ready to be elevated again. The material is therefore delivered to the mixing-drum in "batch" and is also mixed and discharged in "batch".

While my improved charging-apparatus is especially adapted for batch mixers, it can also be used in conjunction with a "continuous" or any other form of mixer, and when used in conjunction with a continuous mixer, it is only necessary in order to obtain a continuous discharge from the mixer that a sufficient quantity of materials be delivered into a receiving hopper opening into the feeding-mechanism which will deliver the material to the mixing-mechanism of the machine at such a speed that the charging-hopper may be refilled and elevated before the batch previ-

ously delivered into the receiving-hopper will have been entirely discharged therefrom.

Having thus described my invention, what I claim is—

1. The combination with a mixing-machine having an upright frame, of a hopper for feeding materials into said machine, a substantially rectangular bucket mounted to tilt on said frame above said hopper and having its spindles provided with a crank-arm, a curved member secured to said frame, and a stop on said curved member and adapted to be engaged by said crank-arm to limit the extent to which the bucket may be tilted, said bucket being held in operative relation to said charging-hopper.

2. The combination with a mixing machine having an upright frame comprising two braced upright members, and a mixing drum whose charging opening is in a plane between said upright members, of a hopper pivotally supported at its outlet end by said upright members and normally in inverted position, and provided with a swinging bail at its receiving end, means for swinging said hopper upward, and a tilting bucket mounted in said frame above the discharge end of said hopper and adapted to discharge its contents therein when tilted.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

CHESTER T. FOOTE.

Witnesses:
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FRED L. DAKE.