No. 734,687. PATENTED JULY 28, 1903.

D. ERTER.

CONCRETE MIXER.

APPLICATION FILED APR. 11, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

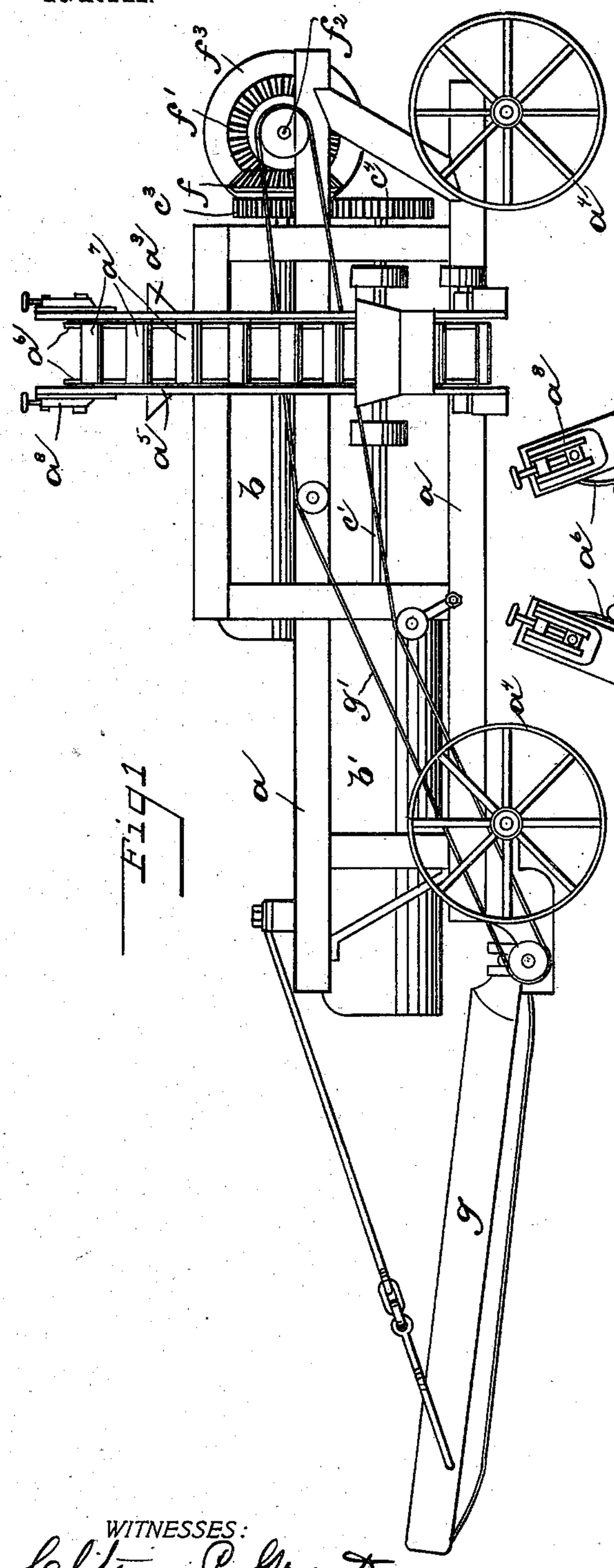


Fig 1.

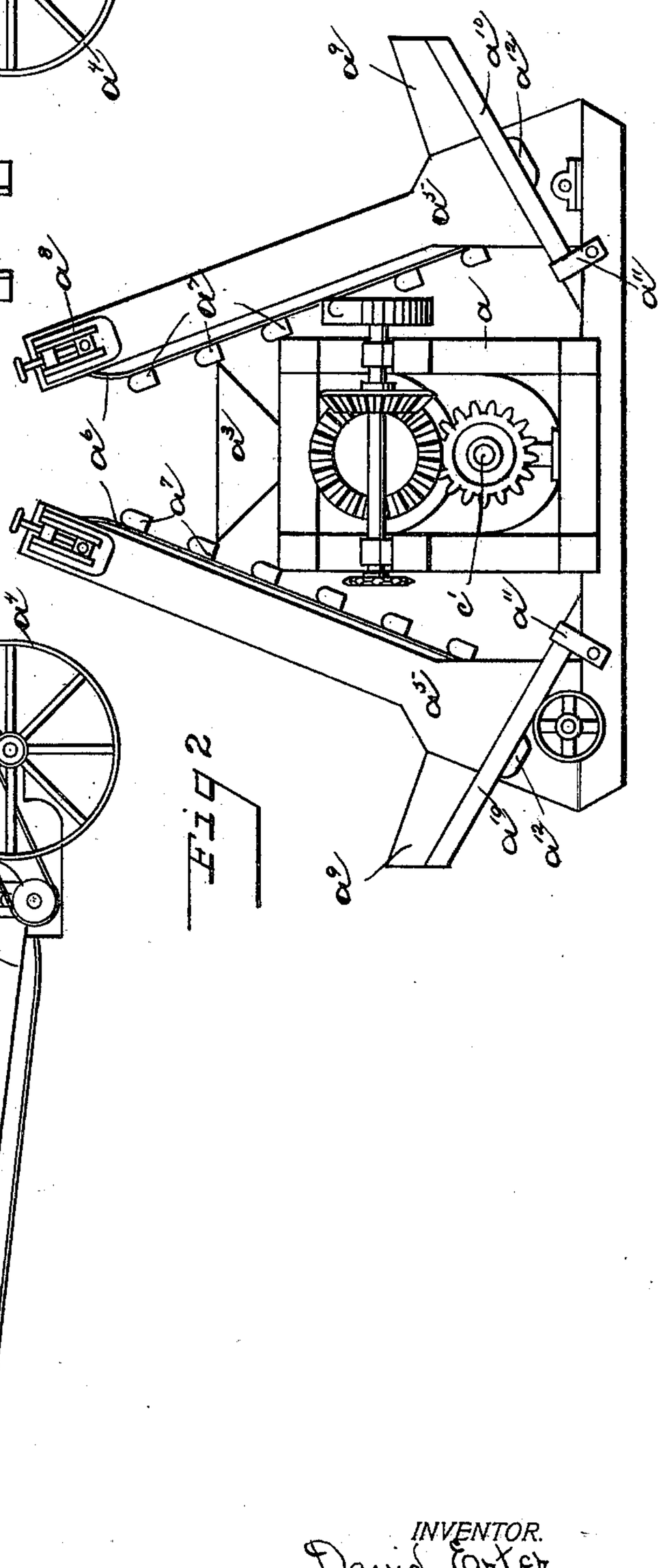


Fig 2.

WITNESSES:

Clifton P. Grant

Chas. I. Welch

INVENTOR.

David Erter

BY Stanley Bond Browne

ATTORNEYS

No. 734,687. PATENTED JULY 28, 1903.

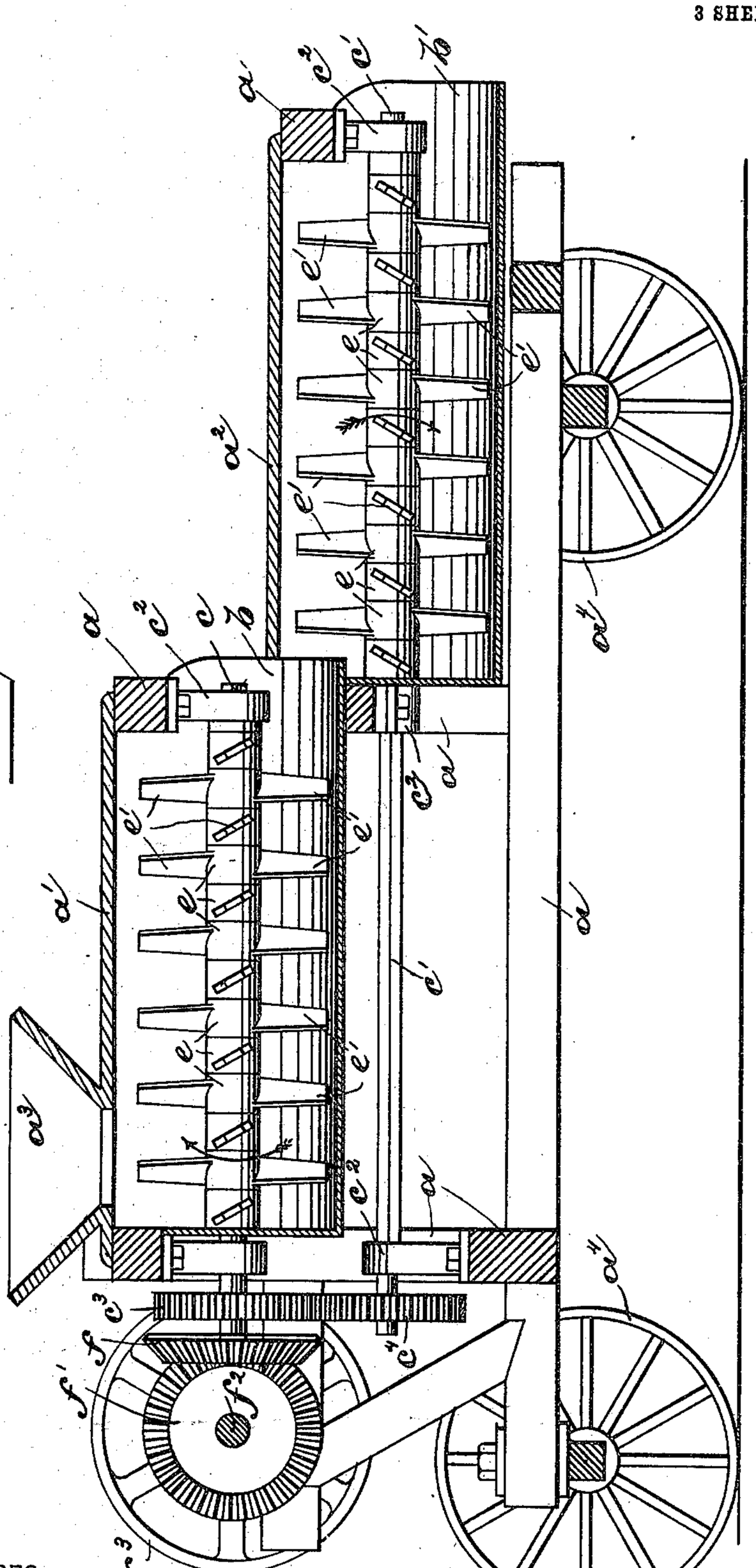
D. ERTER.

CONCRETE MIXER.

APPLICATION FILED APR. 11, 1902.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.



WITNESSES:

T. Llewellyn Walker

Clifton P. Grant

INVENTOR.

David Erter

BY Stanley and Bowman

ATTORNEYS

No. 734,687. PATENTED JULY 28, 1903.

D. ERTER.

CONCRETE MIXER.

APPLICATION FILED APR. 11, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4

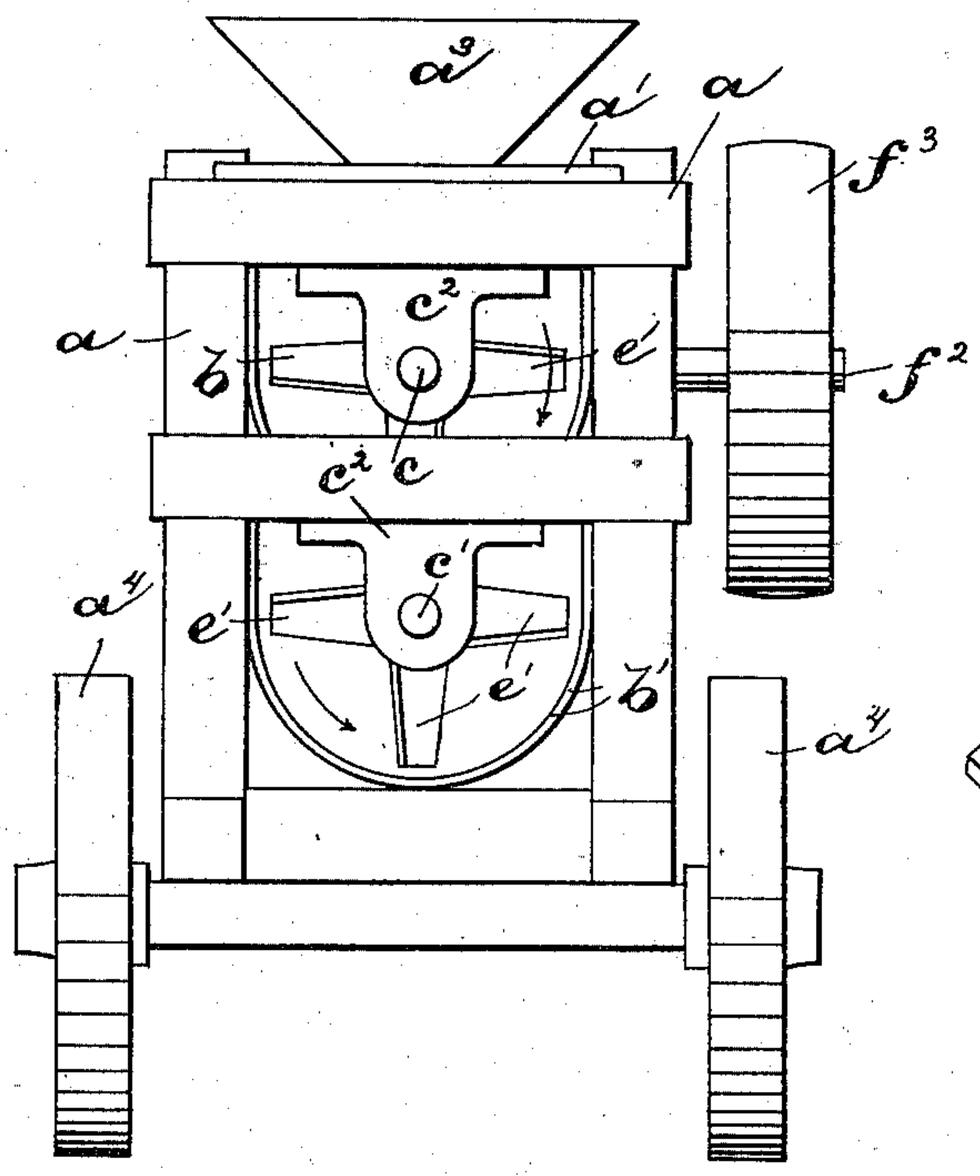


Fig. 5

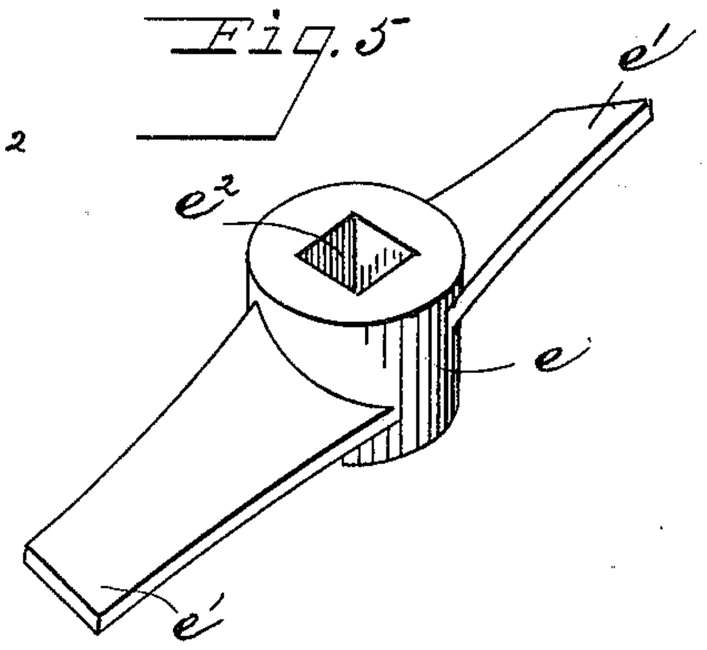
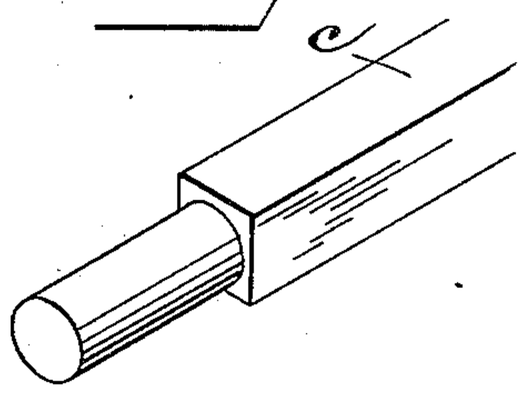


Fig. 6



WITNESSES:

J. Llewellyn Walker

Clifton P. Grant

INVENTOR.

BY David Erter

Bakewell & Brownell

ATTORNEYS

No. 734,687. Patented July 28, 1903.

UNITED STATES PATENT OFFICE.

DAVID ERTER, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO JOSEPH B. CARTMELL, OF SPRINGFIELD, OHIO.

CONCRETE-MIXER.

SPECIFICATION forming part of Letters Patent No. 734,687, dated July 28, 1903.

Application filed April 11, 1902. Serial No. 102,421. (No model.)

To all whom it may concern:

Be it known that I, DAVID ERTER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Concrete-Mixers, of which the following is a specification.

My invention relates to improvements in mechanism for mixing mortar and cement, and particularly for mixing such concrete as is used for the foundation in street-paving. It is highly important that the ingredients of such compositions be uniformly and thoroughly mixed, and a continuous supply of the prepared material is very desirable.

The object of my invention is to provide means by which a continuous supply of thoroughly and evenly mixed material may be had, thus obviating the delaying of other portions of the work in hand while a batch of mortar, cement, or concrete is being prepared and permitting the material to be used in a fresh state or before the ingredients have had time to settle or set.

A further object of my invention is to so construct the machine that it may readily be taken from place to place.

My invention consists in the constructions and combinations of parts hereinafter described, and set forth in the claims.

In the drawings herewith, Figure 1 is a side elevation of my device. Fig. 2 is an end elevation with carrying-wheels omitted. Fig. 3 is a vertical longitudinal section of my device with elevators omitted. Fig. 4 is an elevation from the discharge end of the machine, showing means for stirring the concrete, the elevators being omitted. Fig. 5 is a detail of a mixing member, and Fig. 6 is a detail of the shaft for carrying said mixing members.

Like parts are represented by similar letters of reference in the several views.

In constructing my device I mount on suitable carrying-wheels a^4 a main frame formed by the upright and horizontal members $a\,a\,a$, in which are supported the stirring or mixing devices hereinafter fully described. Upon each side of said main frame and supported on the extensions thereof is an incline conveyer or elevator a^5, so inclined that each will discharge into the hopper a^3 of the mixing mechanism. These elevators a^5 may be of any suitable type. In the drawings I have shown the preferred form, which consists of an upright frame having therein two or more endless chain belts a^6, carrying a series of buckets a^7. Means for tightening said belts are provided, as shown at a^8. Each elevator a^5 is provided with a receiving box or hopper a^9, which may be made detachable by passing the ends of the legs a^{10}, extending from said hopper, through stirrups, all provided on the frame $a\,a\,a$, said legs being further supported on a projection-block a^{12} on the frame of the elevator a^5. These elevators a^5 are driven from the shaft c', hereinafter mentioned.

Within the frame $a\,a\,a$ I mount at different levels two or more semicircular troughs b and b'. In the drawings I have shown two troughs; but more may be used, if desired. Extending longitudinally through each of these troughs b and b' are shafts c and c', mounted in the bearings c^2 on the supporting-frame. These shafts c and c' are preferably square bars, upon which journals have been turned at suitable points, as shown in Fig. 4. Upon these shafts c and c' I arrange the mixing devices, which consist of a series of members e, each provided with two oppositely-extending comparatively narrow blades e'. The planes of these blades e' are arranged oblique to the axis of the member and the respective blades inclined in the opposite direction, as shown in Fig. 3, and, further, the blades e' of the members e are so independently arranged or spaced upon the shafts c and c' that the blades of the respective members will not overlap, and thus practically form a conveyer; but each pair of blades will cut or force a distinct and separate path through the material in the trough, and to this end the blades e' are preferably constructed of somewhat less width at their extremities than at their junction with the members e. The mixing devices $e\,e'$ are preferably provided with the rectangular opening e^2 to fit the preferred form of shaft c or c' and are assembled on said shafts in such a way that the blades e' of each successive member e shall extend at right angles to those of the member preceding it, so that when the blades

of one member are in a vertical position those of the next are horizontal, and they rotate in this relation to each other, and the members *e* in the trough *b'* are arranged the reverse of those in the trough *b* or so that the blades *e'* in the respective troughs or chambers incline in opposite directions. Mounted on the forward end of the shaft *c* is the spur-gear c^3, meshing with a similar gear c^4 on the shaft *c'*; also, on the shaft *c* is a bevel-gear *f*, meshing with a similar gear *f'* on the counter or driving shaft f^2, which is supported on an extension of the main frame. The shaft f^2 also carries a driving-pulley f^3. I have shown each trough *b* and *b'* provided with a movable cover *a'* and a^2, the cover *a'* of the trough *b* having an opening surrounded by a hopper a^3.

At the discharge end of the machine there is mounted (preferably pivoted) a carrier *g*, by which the prepared mixture may be discharged into wagons, &c. This carrier consists of an endless belt of heavy canvas or other suitable material and is driven by the belt or chain *g'* from the counter or driving shaft f^2, as shown in Fig. 1.

The operation of the machine is as follows: The driving power, applied through the shaft f^2 and its pulley f^3, will by means of the bevel-gears *f* and *f'* and spur-gears c^2 and c^3 cause the shafts *c* and *c'*, with their respective mixing-blades, to rotate in reverse directions, as indicated by the arrows in Figs. 3 and 4. The sand, water, and lime, cement, or crushed stone, as the case may be, are fed in proper proportions to the elevators and thence through the hopper a^3 into the trough *b*. The first pair of mixing-blades *e'* force their way through the mass of material, stirring the same and forcing it slightly toward the discharge end of the trough, but not so far that it will be acted upon by the second pair of blades. The blades in their travel cut a separate and distinct furrow through the mass of material, leaving the portion of material acted upon in the intermediate space between the furrows of the first and second pairs of blades. The material acted upon by the blades in their next revolution will in assuming the intermediate position force the mass of material occupying said intermediate position into the path of the next pair of blades, &c. Each successive pair of blades act in a like manner, and between the combined action of the mixing-blades and the pressure of the material in the rear the partially-mixed ingredients are discharged into the trough *b'*, where it is similarly agitated, but in a reverse direction to that in the trough *b*. This reversing of the direction in which the material is agitated in each successive trough is a very essential feature in securing a thorough mixture of the ingredients.

The construction above described, whereby the mixing devices are formed in sections and assembled on a square shaft, is preferable on account of the ease with which it may be manufactured and with which broken parts may be replaced. It is obvious, however, that the entire mixing device may be formed integral or made in sections and attached to a round shaft without changing the general sense of the invention. It is also equally obvious that the members *e* may be made with more than two mixing-blades or that they may be so arranged upon the shaft that the blades will stand at other than right angles to the neighboring blades.

Having thus described my invention, I claim—

1. The combination of a series of troughs longitudinally disposed in their relation to each other at different levels, adapted to successively discharge by gravity from one to another, a suitable frame for said troughs and carrying-wheels therefor, a series of shafts arranged parallel to each other, one for each of said troughs, extending longitudinally through said troughs, a series of members on said shafts having lateral oppositely-extending blades, the planes of the respective blades on each member inclined in opposite directions oblique to the axes of said shafts, said blades being of less width at their outer ends and so spaced on said shafts that the blades of each member will cut separate and independent paths in the mixing material, and intermeshing gears on said shafts whereby the successive shafts will be driven in opposite directions, the blades of each successive shaft being inclined in opposite directions, substantially as specified.

2. The combination of the carrying-frame with longitudinally-disposed mixing-troughs at different levels adapted to discharge into the next one of the series, the highest being the initial trough at one end of the frame, parallel shafts extending from said end of the frame longitudinally through said troughs and having mixing-blades thereon as described, vertically-disposed elevators on each side of said frame adapted to discharge into the initial trough, hoppers for said elevators having legs thereon, blocks on said elevators and stirrups on said frame to engage said legs to removably hold said hoppers in position, a pivoted carrier to receive the discharge from the last trough of the series, a driving-shaft on the end of said frame adjacent to the ends of said parallel shafts, having intermeshing gears with one of said shafts, intermeshing gears on said parallel shafts adapted to drive the successive shafts in opposite directions, direct belt-drives from one of said parallel shafts to said elevators, and a chain-drive from said driving-shaft to said pivoted conveyer, substantially as specified.

In testimony whereof I have hereunto set my hand this 5th day of April, A. D. 1902.

DAVID ERTER.

Witnesses:
F. LLEWELLYN WALKER,
CHAS. I. WELCH.