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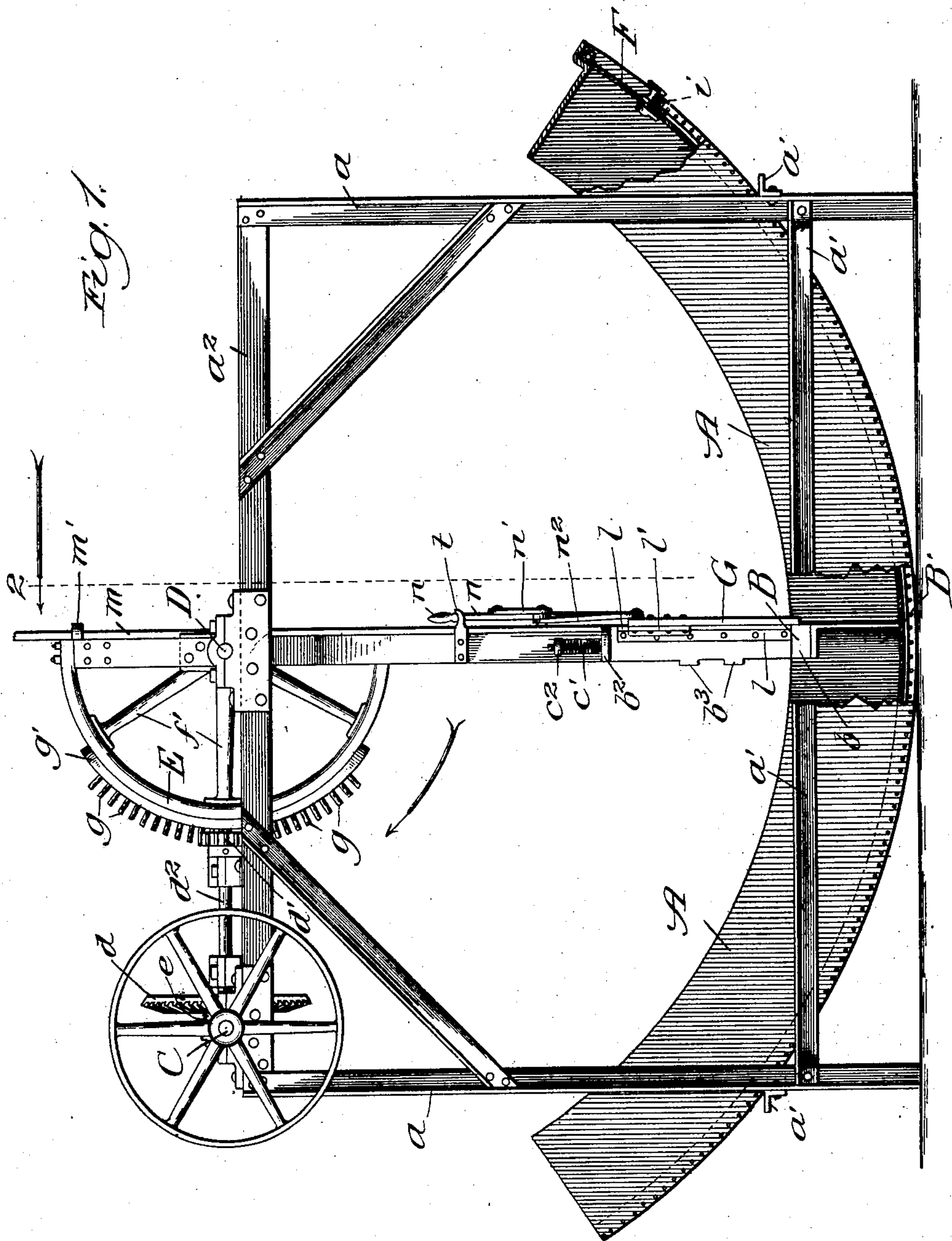
PATENTED AUG. 11, 1903.

L. G. HAASE.  
CONCRETE MIXER.

APPLICATION FILED APR. 24, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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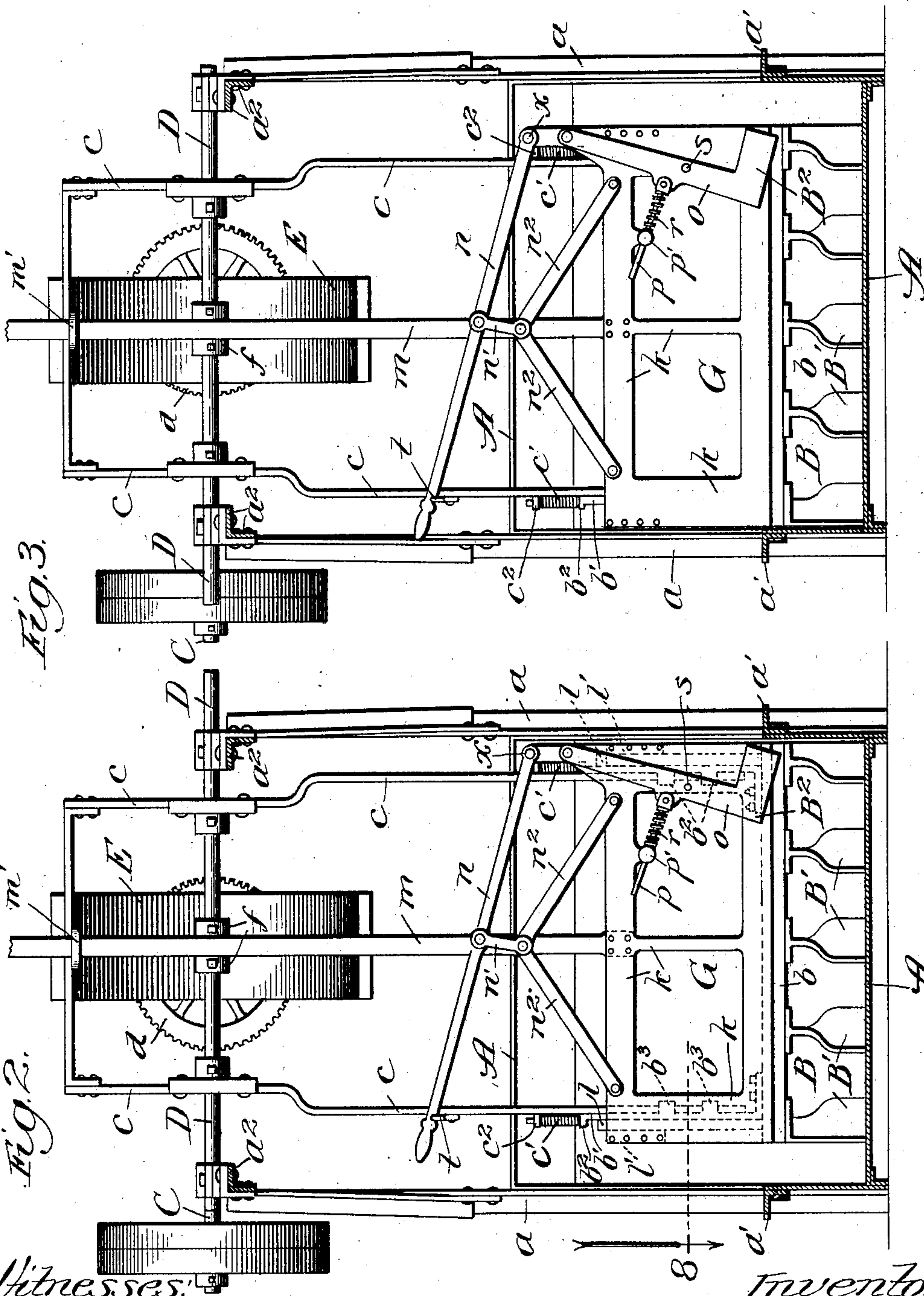
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

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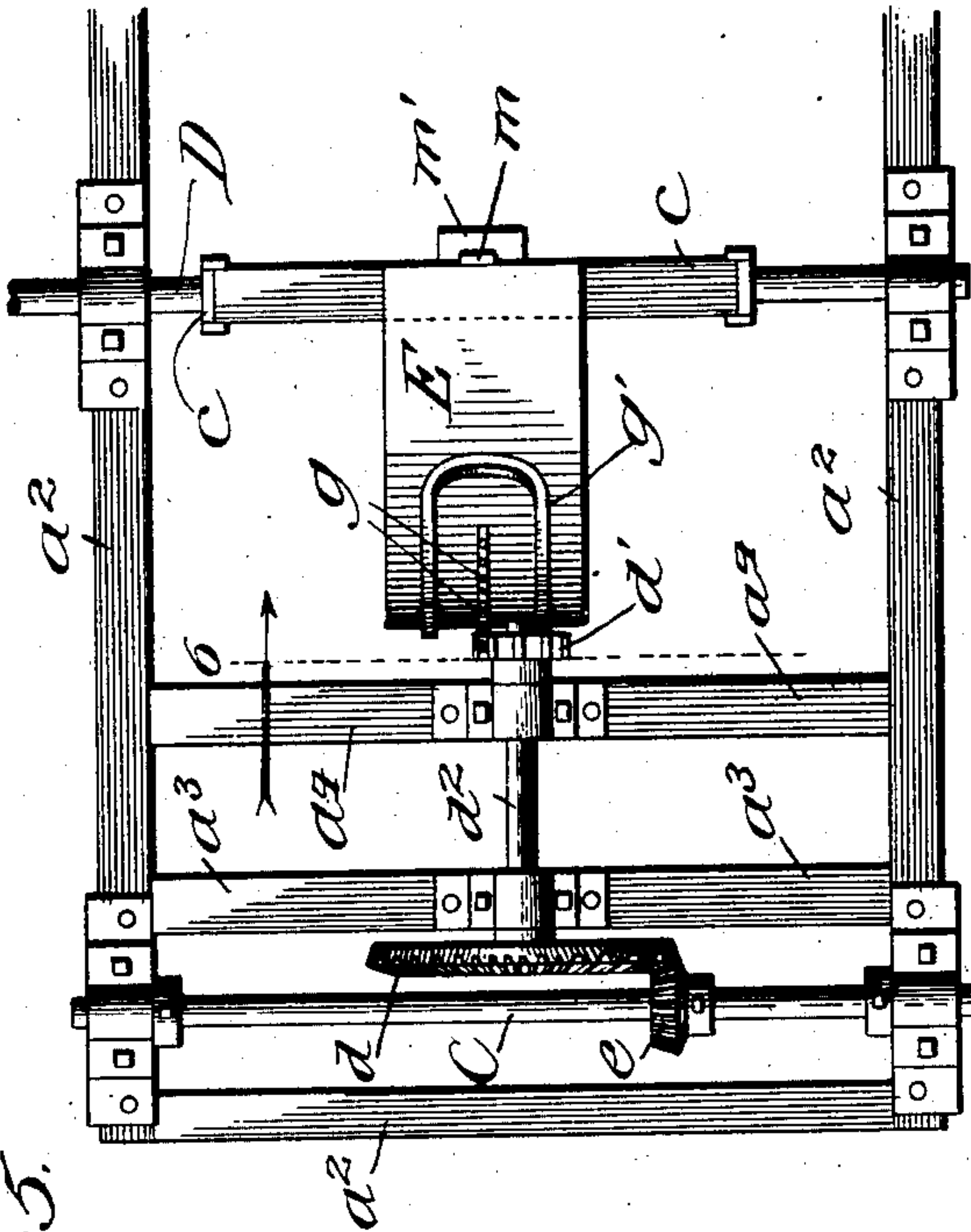


Fig. 5.

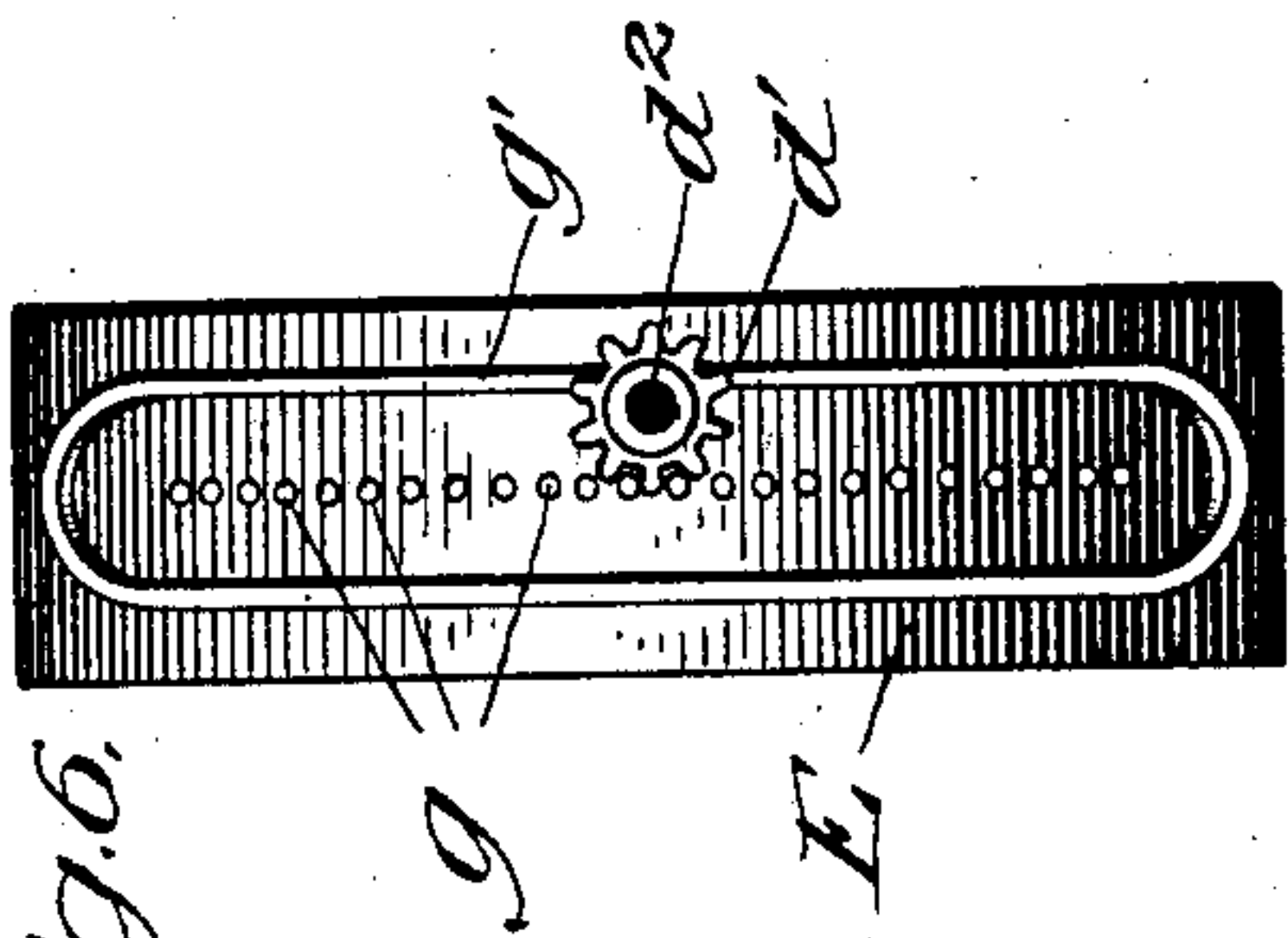


Fig. 6.

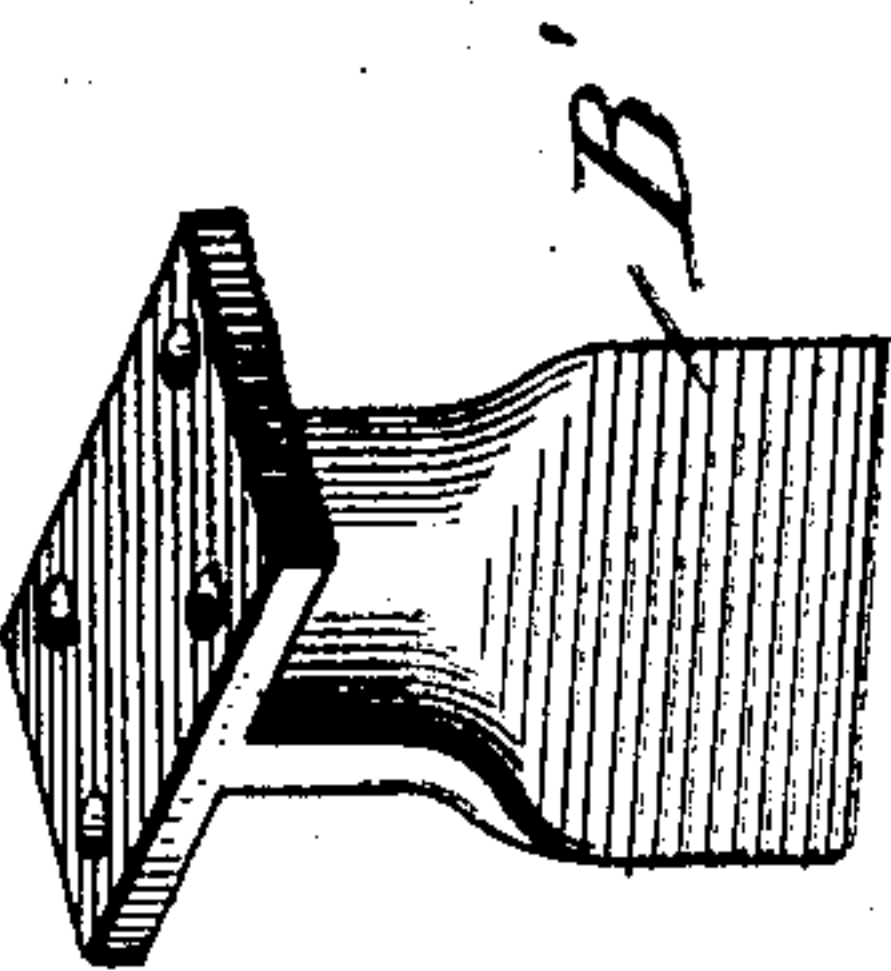


Fig. 7.

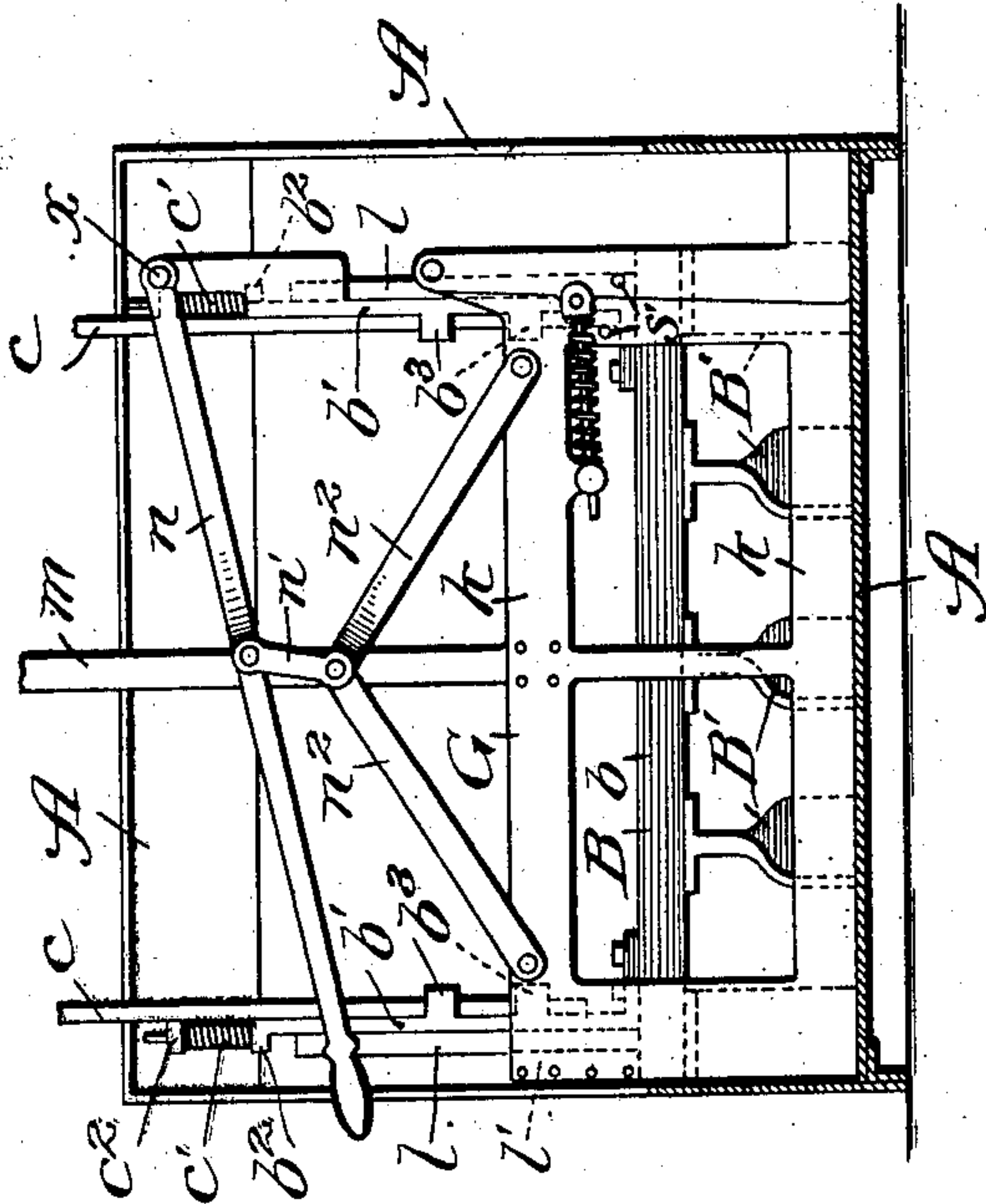


Fig. 8.

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# UNITED STATES PATENT OFFICE.

LEO G. HAASE, OF OAKPARK, ILLINOIS.

## CONCRETE-MIXER.

SPECIFICATION forming part of Letters Patent No. 735,970, dated August 11, 1903.

Application filed April 24, 1903. Serial No. 154,083. (No model.)

*To all whom it may concern:*

Be it known that I, LEO G. HAASE, a citizen of the United States, residing at Oakpark, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Concrete-Mixers, of which the following is a specification.

The operation of mixing the ingredients to form concrete composed of "sand" (including gravel and broken stone) and Portland cement has hitherto been best, because most thoroughly, performed by hand. The work is commonly done in a mortar-box—say one foot by ten feet in dimensions—by spreading therein a measured quantity of sand and gravel, then spreading thereon a suitable quantity of the cement and hoeing the mass to one end of the box into a rather high pyramidal pile. The mass is then hoed to the opposite end of the box by repeatedly pulling up the material from one side of the pile to cause it to roll down the other side, thereby to produce a thorough mixture of the ingredients. After thus moving the mass a number of times from one end to the other of the mortar-box it is spread and the water is added, after which it is twice hoed through, more water being added preparatory to the final hoeing, when the operation is completed, involving arduous and dusty labor, for which dependence must be had on a conscientious man to perform it properly.

The objects of my invention are to provide a machine that will perform the mixing operation as thoroughly as it can be performed by hand and much more expeditiously and to provide a concrete-mixing machine better than that hitherto employed for the purpose involving an elongated trough semicircular in cross-section and of comparatively small diameter containing a shaft rotatable in only one direction and carrying blades for advancing the material in the trough to discharge therefrom at its distal end. The operation, which is continuous, of this old machine produces by reason of its speed much dust, but is defective in producing desired thorough mixture of the materials. Moreover, it does not permit inspection or trial of the condition of the contents in their progress through the trough, and its results are uncertain, because

the operator is required to guess the amount of water to be introduced from time to time, and the material discharges without his knowing whether the ingredients have been thoroughly mixed. Still another style of apparatus for mixing concrete upon which my machine affords an improvement involves a revolving barrel. This apparatus is only suitable for mixing the materials in a dry state, since the addition of water to them causes a portion thereof to adhere to the barrel-wall, preventing such portion from being emptied and retaining it inside the barrel for adherence to it of some of the next batch of dry materials introduced to be mixed therein. All the defects referred to of these prior machines are overcome, and further advantages over them are afforded by my improvement illustrated in the accompanying drawings, in which—

Figure 1 shows my improved machine in its preferred form as to details by a broken view in side elevation. Fig. 2 is a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; Fig. 3, a view like that presented by Fig. 2, but showing the stirrer-blades in their shifted position at the opposite side of the box; Fig. 4, a similar view with the frame and the stirrer-actuating mechanism omitted and showing the scraper device in its lowered position; Fig. 5, a broken plan view of the frame of the machine and the stirrer-actuating mechanism supported therein; Fig. 6, a section taken at the line 6 on Fig. 5 and viewed in the direction of the arrow; Fig. 7, a perspective view of one of the stirrer-blades, and Fig. 8 a section taken at the line 8 on Fig. 2 viewed in the direction of the arrow and enlarged.

The rectangular frame of the machine is shown to be formed of upright corner-beams  $a$ , four in number, suitably braced and reinforced by the tie-beams  $a'$  near the base, and top beams  $a^2$ , provided with bearings for parts of the stirrer-actuating mechanism, herein-after described, and carrying cross-bars  $a^3$   $a^4$  for other parts of said mechanism.

A is the mixing-box, shown in its preferred arc-shaped form, supported at its transverse center on the ground or on any suitable bed and near its opposite ends on the tie-bars  $a'$ ,



which it crosses. The box may involve any suitable form other than that shown, provided its ends be sloping.

B is the stirrer, comprising a base  $b$ , having upright arms  $b'$ , extending from near its opposite ends, terminating in shoulders  $b^2$  at their upper ends, and blades  $B'$ , depending at intervals from the base, the blades being shown slightly twisted and the outer members of the series being straight at their edges adjacent to the sides of the box A to fit against them. A rigid frame  $c$  rises from the stirrer, from the inner sides of the upright arms of which project stirrups  $b^3$ , loosely confining and connecting with the arms  $b'$  of the stirrer the legs of the frame, with which the stirrer is yieldingly connected by means of coiled springs  $c'$ , confined between the shoulders  $b^2$  and lugs  $c^2$ , projecting from the sides of the frame-legs.

C is the drive-shaft, journaled on frame members  $a^2$  and carrying a beveled pinion  $e$ , meshing with a beveled gear  $d$  on one end of a shaft  $d^2$ , journaled on the cross-bars  $a^3$   $a^4$  and carrying at its opposite end a pinion  $d'$ . A rock-shaft D is journaled to adapt it to be shifted longitudinally on frame members  $a^2$  and carries the frame  $c$ , through the legs of which it passes, being rigidly connected therewith. On the rock-shaft is secured to turn with it a hub  $f$ , having spokes  $f'$  radiating from it and carrying a semicircular rack-bed E, having one end fastened to the top bar of the frame  $c$ . The bed E carries to extend midway between its edges and parallel therewith a series of teeth, forming a rack  $g$ , surrounded on the bed by a straight-sided guide-flange  $g'$ , having bowed ends and against the inner side of which bears the end of the shaft  $d^2$ , projecting beyond the pinion  $d'$ , which engages the rack  $g$ . The described rack-and-pinion mechanism affords a stirrer shifting device, for the purpose hereinafter described.

As thus far described the machine operates as follows: With a batch of the materials to be mixed in the box A the drive-shaft is set in motion to rotate the shaft  $d^2$  and cause the pinion  $d'$  in operating against one side of the rack to swing the rack-bed, and with it the rock-shaft D, frame  $c$ , and stirrer device B accordingly, thereby moving the stirrer from the central position in which it is shown toward one end of the box. On reaching that end an end tooth of the rack will be engaged by the pinion, which will thereupon by such engagement shift laterally the rack-bed, and with it the rock-shaft and frame  $c$  and the stirrer device in the box, against a side thereof, and the rack under the guidance of the flange  $g'$  against the pinion  $d'$  will have its opposite side brought into engagement with the pinion, which will thereby be caused to move in the contrary direction to swing accordingly the rack-bed, rock-shaft and frame  $c$ , and the stirrer device in the box to its opposite end in a path somewhat to one side of that traversed by the stirrer-blades in their first-de-

scribed movement. When the opposite end of the rack becomes engaged by its pinion, the latter is caused by the guide-flange to shift the stirrer device against the opposite side of the box and to swing it in the box toward an end thereof in the same direction as that first described. The springs  $c'$  permit the stirrer device to yield in encountering any obstruction in the paths of the blades, and thus reduce the liability therefrom to fracture to the minimum.

As will be seen from the foregoing description of the operation a threefold action is exerted by the stirrer upon the ingredients of the material to be mixed—that is to say, the swing of the stirrer-blades in either direction lengthwise of the box causes them to plow through the material, carrying it up the slope of the box and permitting the excess beyond the capacity to carry of each blade to escape through the spaces between the blades and roll back down over the bed of material, and at the end of each stroke of the stirrer when it is suddenly shifted the material still in advance of the blades rolls back down the bed. In each movement lengthwise of the box of the stirrer, owing to the shifting of the blades at the end of each stroke, they plow through the hills between the furrows produced by them in the movement in the other direction, and by shifting the stirrer as described it circulates the material, as it were, about the box. The threefold action thus imparted to the stirrer device effects a most thorough mixture of the ingredients of the material in a comparatively short time, requiring about five minutes to accomplish what it takes half an hour to perform by the hand operation, and during the operation the contents of the box are visible to ready inspection and testing and the quantity of water added from time to time may be gaged with certainty.

To effect thorough and convenient evacuation of the box of its contents forming the finished mixture, I provide in one end of its base a door or valve F, hinged to swing downward, for opening it and fastened in its raised and closed position by a rotatable catch  $i$ , and on the stirrer device I provide a scraper G. The preferred construction thereof (though it may be variously changed) is that illustrated in the drawings and described as follows: A rectangular blade or frame  $k$  is attached to the upright arms  $b'$  of the stirrer device to adapt it to be raised and lowered thereon by means of angle-bars  $l$ , Fig. 8, secured to the outer sides of the arms  $b'$  to extend lengthwise thereof and overlapped by guides  $l'$ , riveted to the frame  $k$  of the scraper to project beyond its lateral edges. A guide-bar  $m$  rises from the center of the scraper-frame and passes through a loop  $m'$  on the top bar of the frame  $c$  and a lever  $n$ , fulcrumed at one end, as at  $x$ , to an extension of one of the arms  $b'$  of the stirrer device and releasably resting near its handle end in a support  $t$  on the frame  $c$ , is connected



between its ends by a link  $n'$  with the scraper-frame  $k$  near its opposite ends through the medium of brace-bars  $n^2$ . Near one end of the scraper-frame, on an extension thereof, is pivoted at its upper end a supplemental scraper-blade comprising a leg  $o$ , terminating in a foot  $B^2$ , to operate when the scraper, with the stirrer-blades, is shifted to the side of the box  $A$  opposite that against which the stirrer-blade at one end of the series is shown to bear in Fig. 2 and to that against which it is shown to bear in Fig. 3. Below the upper end of the leg  $o$  it has pivotally connected with it one end of a rod  $p$ , the opposite end of which is slidably confined in a bearing  $p'$  on the frame  $k$ , and a coiled spring  $r$  is confined about this rod to tend to force outward the foot  $B^2$ , which may be fastened against this tendency by a pin  $s$ , inserted through it into an opening  $s'$ , Fig. 4, in the frame  $k$ . The scraper is brought into use when the mixing of the material is finished. Then the door or valve  $F$  is opened, with the stirrer and scraper devices at the opposite end of the box and in the position relative to the sides of the box shown in Fig. 3. Preliminary to scraping, the operator releases the lever  $n$  to permit the scraper to lower by gravity in advance of the stirrer-blades, and he then withdraws the pin  $s$  to permit the spring  $r$  to protrude the foot  $B^2$  against the adjacent side of the box to supplement the scraper-frame by filling the space between it and that side of the box. Thereupon actuating the drive-shaft turns the frame  $c$  in the direction to cause the scraper to push the contents of the box out of it through the opening therein provided with the valve  $F$ . When the box has been emptied, to prepare it for another batch of the ingredients to be mixed the operator restores the scraper-foot  $B^2$  to the position in which it is shown in Figs. 2 and 3 and fastens it therein with the pin  $s$ .

While I have described my improved machine as a concrete-mixer, its use is not intended to be confined thereto, since it may be used to advantage for mixing other materials; nor do I intend that my invention shall be understood to be limited to the particular construction of the machine shown and described, since it may be variously modified by those skilled in the art without departure from the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a mixer for concrete and the like, the combination with a frame of a box, a bladed stirrer suspended to swing in said box, driving means for said stirrer operating to swing it back and forth, and a shifting device actuated by said driving means to shift said stirrer laterally near each end of its swinging movement.

2. In a mixer for concrete and the like, the combination with a frame of a box, a bladed stirrer suspended to swing in said box, a scraper adjustably supported on said stirrer

to be raised and lowered thereon, and driving means for said stirrer and scraper operating to swing them back and forth.

3. In a mixer for concrete and the like, the combination with a frame of a box, a bladed stirrer suspended to swing in said box, a scraper adjustably supported on said stirrer to be raised and lowered thereon, driving means for said stirrer and scraper operating to swing them back and forth, and a shifting device actuated by said driving means to shift said stirrer and scraper laterally near each end of their swinging movement.

4. In a mixer for concrete and the like, the combination with a frame of a box, a bladed stirrer suspended to swing in said box, a scraper adjustably supported on said stirrer to be raised and lowered thereon and provided with an adjustable supplemental scraper-blade, driving means for said stirrer and scraper operating to swing them back and forth, and a shifting device actuated by said driving means to shift said stirrer and scraper near each end of their swinging movement.

5. In a mixer for concrete and the like, the combination with a frame of a box, a rock-shaft journaled on said frame, a bladed stirrer in said box on a frame suspended from said rock-shaft to move with it, a rack within a guide-flange supported on said rock-shaft, a drive-shaft, and a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging said rack, substantially as and for the purpose set forth.

6. In a mixer for concrete and the like, the combination with a frame of an arc-shaped box, a rock-shaft journaled on said frame and movable longitudinally in its bearings, a bladed stirrer in said box on a frame suspended from said rock-shaft to move with it, a curved rack-bed supported on said rock-shaft and carrying a rack and a guide-flange surrounding it, a drive-shaft, and a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging said rack, substantially as and for the purpose set forth.

7. In a mixer for concrete and the like, the combination with a frame of an arc-shaped box, a rock-shaft journaled on said frame and movable longitudinally in its bearings, a bladed stirrer in said box yieldingly supported on a frame suspended from said rock-shaft to move with it, a curved rack-bed supported on said rock-shaft and carrying a rack and a guide-flange surrounding it, a drive-shaft, a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging said rack, and a scraper adjustably supported on said stirrer, substantially as and for the purpose set forth.

8. In a mixer for concrete and the like, the combination with a frame of an arc-shaped box, a rock-shaft journaled on said frame and movable longitudinally in its bearings, a



bladed stirrer in said box supported on a frame suspended from said rock-shaft to move with it, a rack-bed supported on said rock-shaft and carrying a rack and a guide-flange surrounding it, a drive-shaft, a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging said rack, and a scraper adjustably supported on said stirrer and provided with a supplemental adjustable scraper-blade, substantially as and for the purpose set forth.

9. In a mixer for concrete and the like, the combination with a frame of an arc-shaped box, a rock-shaft journaled on said frame and movable longitudinally in its bearings, a bladed stirrer in said box on a frame suspended from said rock-shaft to move with it, a rack-bed supported on said rock-shaft and carrying a rack and a guide-flange surrounding it, a drive-shaft, a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging with said rack, a scraper adjustably supported on said stirrer, and a spring-pressed supplemental scraper-blade pivotally supported on said scraper and provided with

means for releasably securing it in opposition to its controlling-spring, substantially as and for the purpose set forth.

10. In a mixer for concrete and the like, the combination with a frame of an arc-shaped box, a rock-shaft journaled on said frame and movable longitudinally in its bearings, a bladed stirrer in said box yieldingly supported on a frame suspended from said rock-shaft to move with it, a rack-bed supported on said rock-shaft and carrying a rack and a guide-flange surrounding it, a drive-shaft, a shaft geared to said drive-shaft with one end in engagement with said flange and provided with a pinion engaging said rack, a scraper adjustably supported on said stirrer, a spring-pressed supplemental scraper-blade pivotally supported on said scraper and provided with means for releasably securing it in opposition to its controlling-spring, and a lever connected with said scraper for raising and lowering it on its support, substantially as and for the purpose set forth.

LEO G. HAASE.

In presence of—

WALTER N. WINBERG,  
W. B. DAVIES.