

No. 721,333.

PATENTED FEB. 24, 1903.

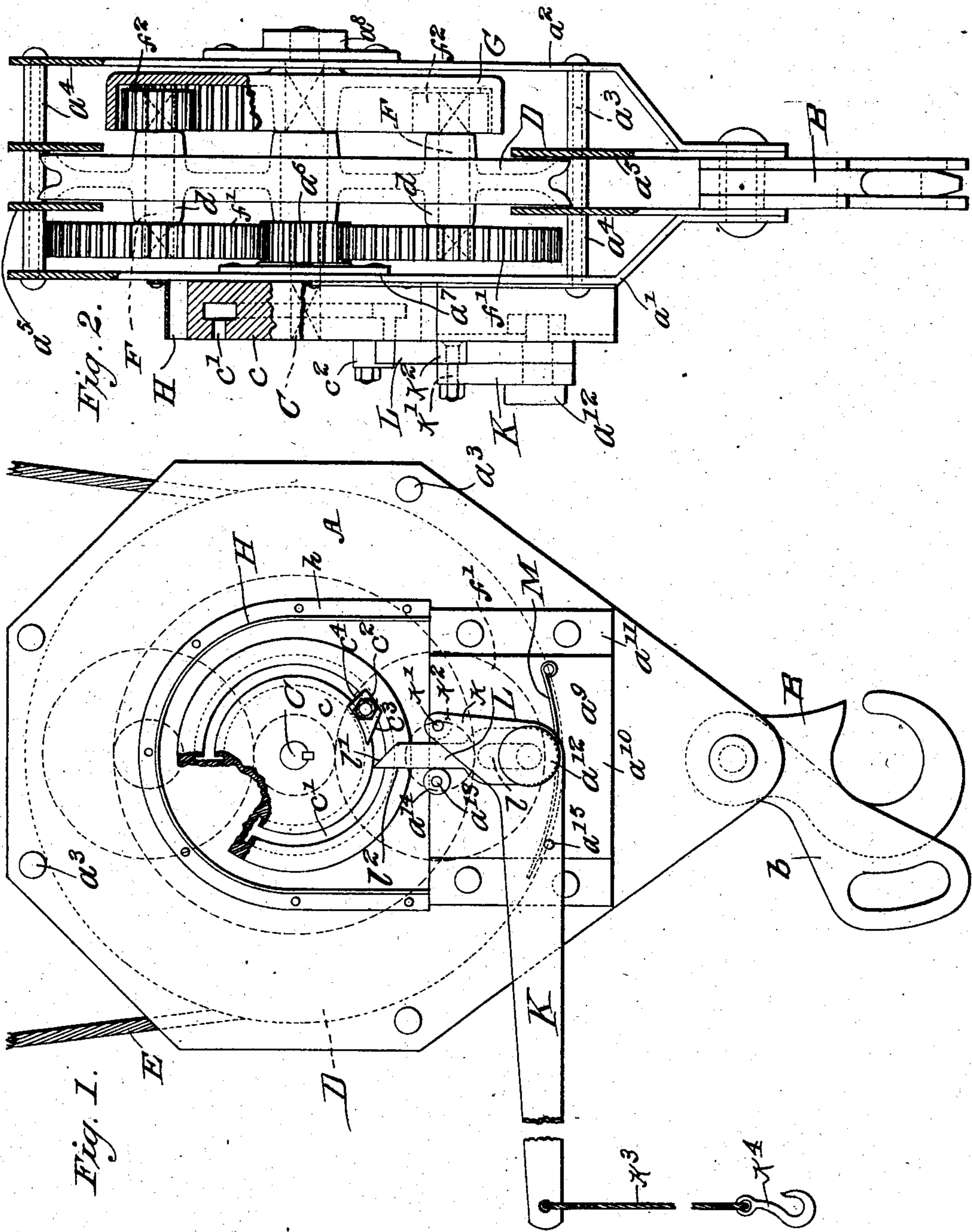
W. P. SHERMAN.

APPARATUS FOR AUTOMATICALLY DISCHARGING BUCKETS.

APPLICATION FILED MAY 24, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:  
G. Davis  
Geo. Wm. Saywell

INVENTOR:  
W. P. Sherman  
by his attorney,  
J. B. Fay

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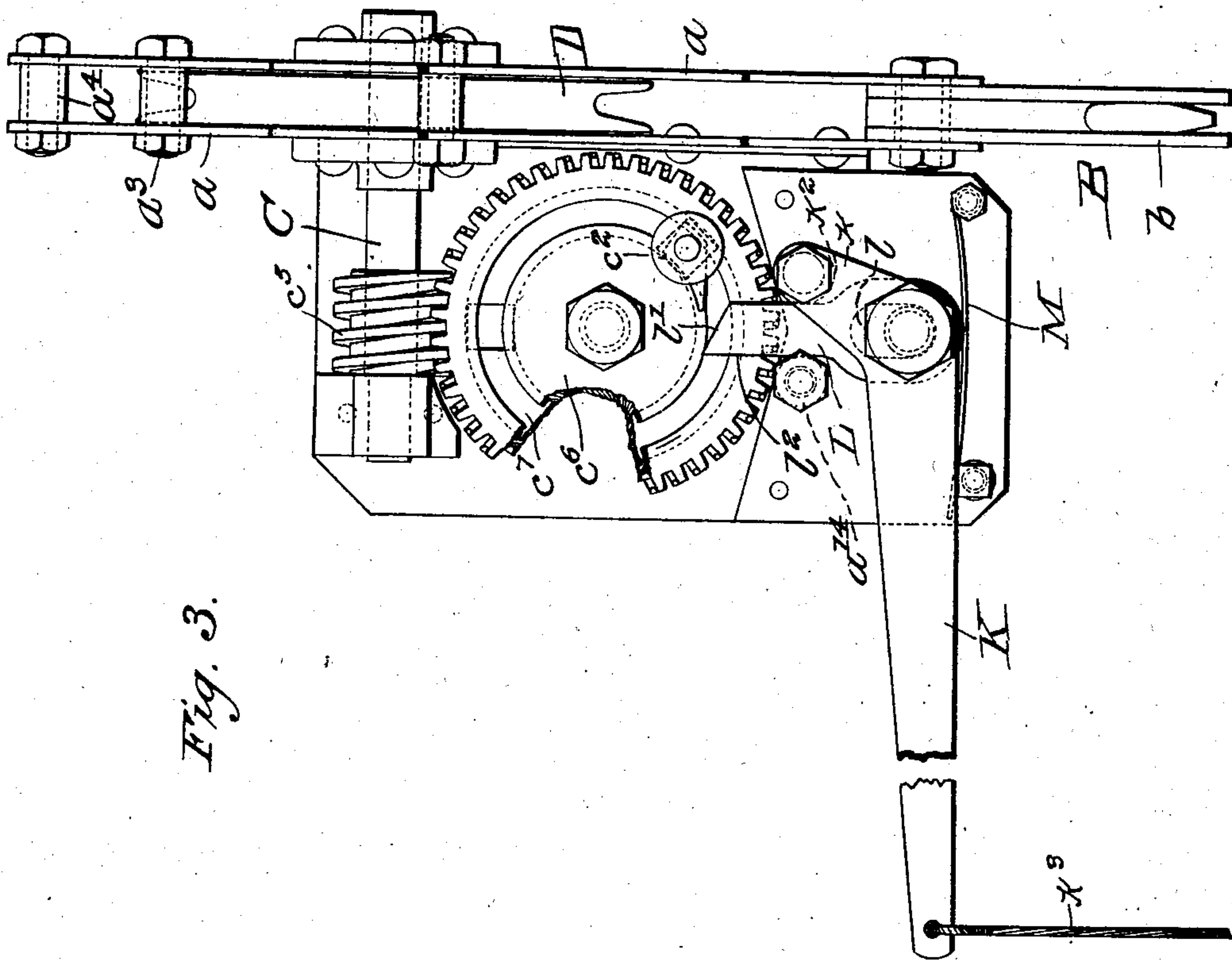


Fig. 3.

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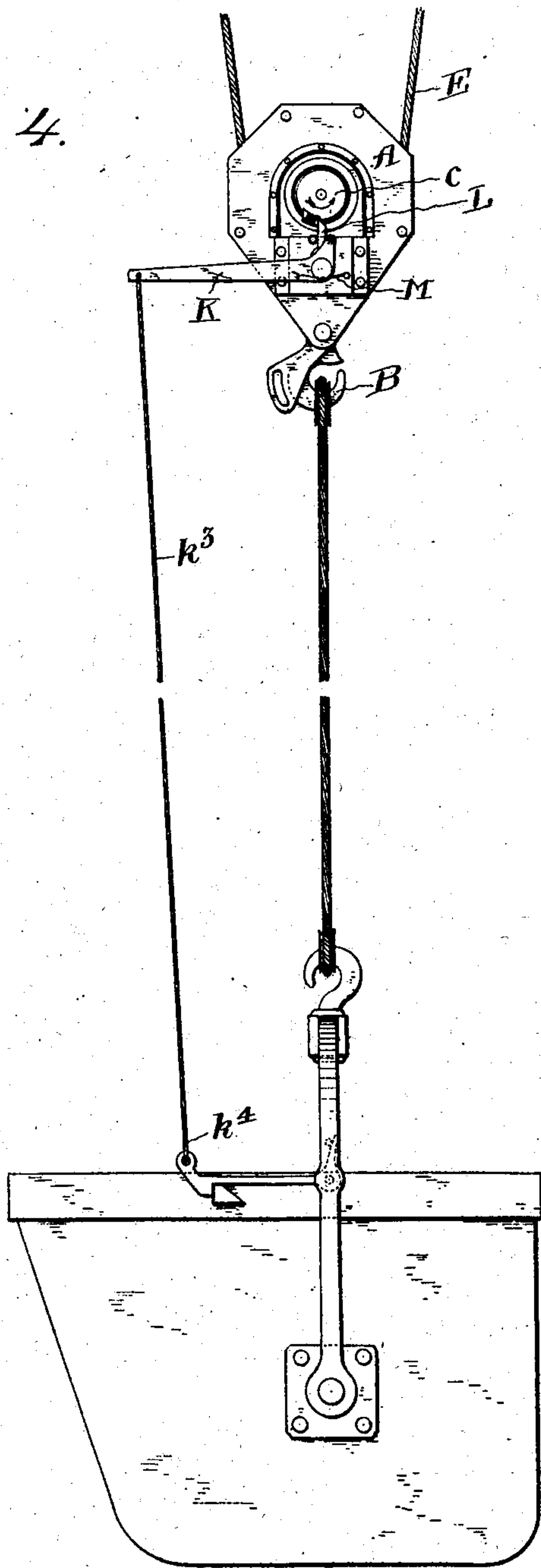
APPARATUS FOR AUTOMATICALLY DISCHARGING BUCKETS.

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NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 4.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM P. SHERMAN, OF WILLOUGHBY, OHIO.

## APPARATUS FOR AUTOMATICALLY DISCHARGING BUCKETS.

SPECIFICATION forming part of Letters Patent No. 721,333, dated February 24, 1903.

Application filed May 24, 1902. Serial No. 108,780. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. SHERMAN, a citizen of the United States, and a resident of Willoughby, county of Lake, and State of Ohio, have invented a new and useful Improvement in Apparatus for Automatically Discharging Buckets, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to conveying apparatus suitable for transporting materials—such as clay, coal, &c.—and it pertains more especially to those methods of handling such materials which employ blocks or tackles. Its object is to provide such a construction of a block as will enable a bucket suspended therefrom to be automatically dumped at a predetermined point, which point may be determined or controlled by the passing of the suspending-cable through the block.

More specifically, the invention consists in a certain combination and construction of parts, to be more fully described hereinafter and definitely set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure 1 represents in side elevation a block constructed in accordance with my invention, certain parts being broken away, as indicated. Fig. 2 represents a front elevation, certain parts, however, being in section to show more clearly their construction. Fig. 3 represents a modified form of my device, certain parts being broken away, as before, for the sake of clearness. Fig. 4 represents a front view of the form of block shown in Fig. 1 with a bucket attached thereto and provided with tripping mechanism.

Referring to the parts by letter, and especially to Figs. 1 and 2, A represents a block formed, substantially, of side plates  $a'$   $a^2$ , as indicated, which parts are connected together by bolts or rivets  $a^3$  and maintained at a suit-

able distance apart by means of the separators  $a^4$ , which surround them. The outline of these side plates is preferably substantially that shown. It will appear that the lower edges converge and support between them a suitable hook B, such as usually used for the purpose of supporting buckets or conveying cars. A spindle or shaft C is rotatably mounted between these side plates, and upon this spindle is loosely carried a sheave D, beneath which passes a cable or line E. Provision is made for guiding the cable and preventing any possibility of its accidental displacement consisting of guide-plates  $a^5$   $a^5$ , which are fastened on either side of the sheave, their lower extremities lying between the aforesaid side plates and the aforesaid hook. This sheave D is provided with bosses  $d$   $d$ , in which are mounted rotatable studs or spindles F, carrying large gears  $f'$  at one extremity, as indicated, and pinions  $f^2$  at the other extremity. A pinion  $a^6$  carries a flange  $a^7$ , by which it is secured to the side plate  $a'$ . It constitutes a bearing for the spindle C. Another bearing  $a^8$  for the spindle is secured to the opposite side plate  $a^2$ . An internal gear G is fixedly mounted upon the spindle C. From this construction it will appear that if the sheave D were rotated upon the spindle C the large gears  $f'$ , carried by it, would be rotated with their spindles F, since they mesh with the fixed pinion  $a^6$ , and their rotation would be transmitted to the aforesaid internal gear G by means of the small pinions which they carry.

The movement of the spindle C is utilized to actuate the dumping mechanism. For this purpose the extremity of the spindle has mounted upon it rigidly a cam-disk  $c$ , provided, as indicated, with a circular T-slot in its outer face, in which slot is adjustably mounted a cam  $c^2$ . A shield H is provided, the upper portion whereof conforms in its outline to that of the cam-disk, as indicated. It is attached to the side plate by means of the flange  $h$ , which is integral with it. Below it a lever-plate  $a^9$  is secured to the side plate, and it is preferably shaped substantially as shown and provided with an elevated central portion  $a^{10}$  and marginal side flanges  $a^{11}$ , which afford means for securing it in



place. A stud  $a^{12}$ , which is secured to this lever-plate, constitutes a pivot for a trip-lever K. This lever is preferably formed substantially as shown and is provided with an upwardly-projecting ear  $k$  and with a laterally-projecting pin  $k'$ , carrying a friction-roller  $k^2$ . A second pin  $a^{13}$ , similar in construction to the pin  $k'$ , is rigidly secured to the plate  $a^9$  and carries a similar friction-roller  $a^{14}$ . Between these two friction-rollers is mounted a dog L, the lower portion whereof is enlarged, as indicated, and provided with an elongated opening  $l$ , which lies around the aforesaid fixed stud  $a^{12}$ , and a leaf-spring M is attached to the plate  $a^9$  and rests near its tip upon a pin  $a^{15}$ , carried by the lever K. It affords means for normally maintaining the dog in an elevated position and the lever in a depressed position.

As will appear from an inspection of Fig. 1, the upper extremity of the dog L is provided with an inclined face  $l'$ , and there is a corresponding inclined face  $c^3$  upon the aforesaid cam  $c^2$ . Now if the direction of the rotation of the cam-disk were such as to bring the inclined faces in contact the dog would evidently be depressed until the tripping-cam has passed completely over it, and this of course would have no effect whatever upon the lever. If, however, the rotation of the cam-disk were in the opposite direction, the rear face  $c^4$  of the cam would contact with the side face  $l^2$  of the dog. The dog L would now constitute a lever pivoted at the stud  $a^{12}$ , and a continued movement of the cam would tilt the dog to the right, move the friction-roller  $k^2$  also to the right, and this would operate to elevate the lever K. The extremity of the lever is provided with a line  $k^3$ , carrying a hook  $k^4$ , which is adapted to attach to the bucket or car below its trunnions or tripping mechanism, so that an upward movement of the hook effects the dumping of the bucket or effects the operation of such tripping mechanism, as will be readily understood from an inspection of Fig. 4.

In connection with the main hook B is shown a handle  $b$ , adapted to facilitate the placing or removal of the bail of a bucket from the eye of the hook.

As stated, Fig. 3 shows a modified form of my device. In this instance the arrangement for producing the rotation of the cam-disk comprises the spindle C, which is rigid with the sheave D. The spindle C carries a worm  $c^5$ , meshing with a worm-wheel  $c^6$ , which latter constitutes also the cam-disk and is provided with a T-slot  $c^7$  in its face for this purpose. The sheave is mounted between closely-placed side plates  $a$ , from which depends the hook B, as before. The other parts used in connection with this modification are substantially the same as their corresponding ones of the first-described form. Evidently by a rotation of the sheave a movement is transmitted to the cam-disk or worm-wheel  $c^6$ , which by its rotation effects either a de-

pression of the dog or a rotation of the same about the pivot of the lever with the same effects and results as before.

In the operation of my invention it is of course immaterial whether the direction in which the bucket is carried is horizontal, vertical, or otherwise. In all cases the point at which the bucket is relieved of its charge depends solely upon the amount of cable which has passed through the sheave on the block. Evidently the presence of the reducing mechanism makes the amount of rotation of the cam-disk with respect to the sheave very small, so that before the bucket has traveled to the end of its course the cam-disk will not have made as yet a complete revolution, and the fact that the cam is adjustably mounted in the T-slot enables it to be secured at such point upon the face of the disk as will cause the dumping mechanism to be operated precisely at the instant desired.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In combination, a body adapted to support a bucket, a rotatable cam, a longitudinally-guided member which may engage said cam, means whereby said member may rotate about a pivot and a lever actuated by said rotation, substantially as described.

2. In combination, a body adapted to support a bucket, a rotatable cam carried thereby, a longitudinally-guided member, said member and said cam having inclined faces, means whereby said member may rotate about a pivot, a lever operated by said rotation and means for normally maintaining said member in the path of said cam, substantially as described.

3. In combination, a tackle-block adapted to support a bucket, a sheave carried by said block, a cam actuated by said sheave, a member normally projecting into the path of said cam, said cam and said member having inclined faces whereby said cam may depress said member when rotating in one direction, said cam being adapted to displace said member laterally when rotating in the opposite direction, and means actuated by the lateral displacement of said member for dumping said bucket, substantially as described.

4. In combination, a tackle-block adapted to support a bucket, a sheave mounted thereon, a cam actuated by said sheave, a member normally maintained in the path of said cam, means for longitudinally guiding said member, means whereby said member may rotate about a pivot, said cam and said member having inclined faces and mechanism operated by said member for dumping said bucket, substantially as described.



5. In combination, a tackle-block adapted to support a bucket, a sheave carried thereby, a cam actuated by said sheave, a member normally constrained in the path of said cam, a fixed stud constituting a guide for said member, said stud constituting a pivot about which said member may rotate, said cam and member having inclined faces which may cooperate to depress said member, said cam and member having other faces which may cooperate to rotate said member about said stud, and mechanism operated by the rotation of said member for dumping said bucket, substantially as described.

6. In combination, a tackle-block adapted to support a bucket, a sheave carried thereby, a cam actuated by said sheave, a fixed stud adapted to form a guide for moving said member longitudinally and constituting a pivot about which said member may rotate, a lever pivoted upon said stud, said lever being adapted to dump said bucket, said cam and member having inclined faces which may cooperate to withdraw said member from the path of said cam, and other faces which may cooperate to rotate said member about said stud, and means whereby said member may actuate said lever in rotating, substantially as described.

7. In combination, a tackle-block adapted to support a bucket, a sheave carried thereby, a cam actuated by said sheave, a dog, means for normally maintaining said dog in the path of said cam, said dog having an elongated opening extending longitudinally thereof, a fixed stud passing through said opening, a lever pivoted on said stud and engaging the side of said dog, said lever being adapted to dump said bucket, substantially as described.

8. In combination, a tackle-block adapted to support a bucket, a sheave carried thereby, a cam actuated by said sheave, reducing mechanism between said cam and said sheave, a dog, means for normally maintaining said dog in the path of said cam, said dog having a longitudinal elongated opening, a fixed stud passing through said opening, a lever pivoted upon said stud and adapted to be engaged by said dog, said cam and said dog having inclined faces, whereby said dog may be de-

pressed by the rotation of said cam in one direction, said lever being adapted to dump said bucket, substantially as described.

9. In combination, a tackle-block adapted to support a bucket, a sheave rotatably mounted therein, a cam actuated by said sheave, a dog, means for normally maintaining said dog in the path of said cam, said dog having an elongated longitudinal opening, a stud passing therethrough, and constituting a guide and a pivot about which said dog may rotate, means for guiding said dog at another point on one side and a lever adapted to engage said dog upon the other side, means whereby said cam may depress said dog longitudinally when passing in one direction and may rotate said dog about said stud when passing in the other direction, said lever being adapted to dump said bucket, substantially as described.

10. In combination a tackle-block, a fixed gear carried by said block, gears meshing therewith and carried by said sheave, a cam operated by said gears, and means operated by said cam for dumping said bucket, substantially as described.

11. In combination, a tackle-block, a sheave carried thereby, a fixed gear carried by said block, larger gears carried by said sheave and meshing with said fixed gear, pinions driven by said larger gears, a gear actuated by said pinions, a cam actuated by said last gear and means actuated by said cam for dumping said bucket, substantially as described.

12. In combination, a tackle-block adapted to support a bucket, a spindle passing through, a sheave loosely mounted on said spindle, a pinion fixed to said block and concentric with said spindle, gears carried by said sheave and meshing therewith, pinions rigid with said gears, an internal gear driven by said pinions and rigidly mounted upon said spindle, a cam rigidly mounted upon the same spindle, and mechanism operated by said cam for dumping said bucket, substantially as described.

Signed by me this 22d day of May, 1902.

WILLIAM P. SHERMAN.

Attest:

D. T. DAVIES,  
GEO. WM. SAYWELL.