

No. 835,452.

PATENTED NOV. 6, 1906.

A. MERTES.

PAWL AND RATCHET DEVICE FOR DUMPING VEHICLES.

APPLICATION FILED NOV. 2, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

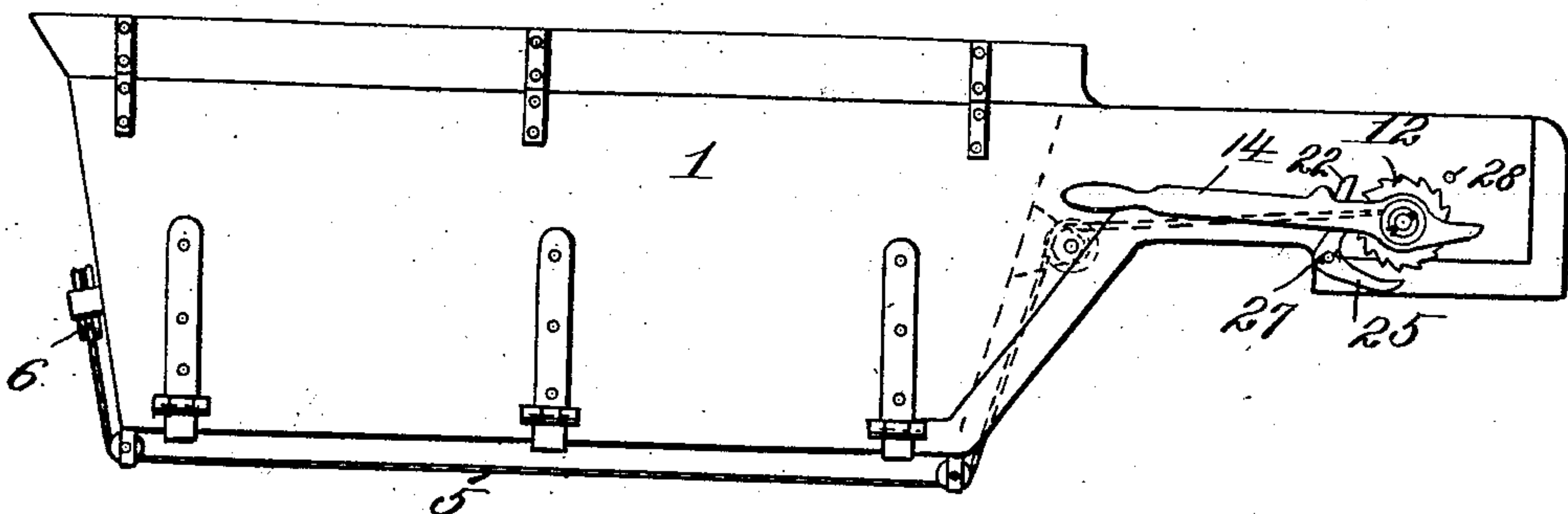
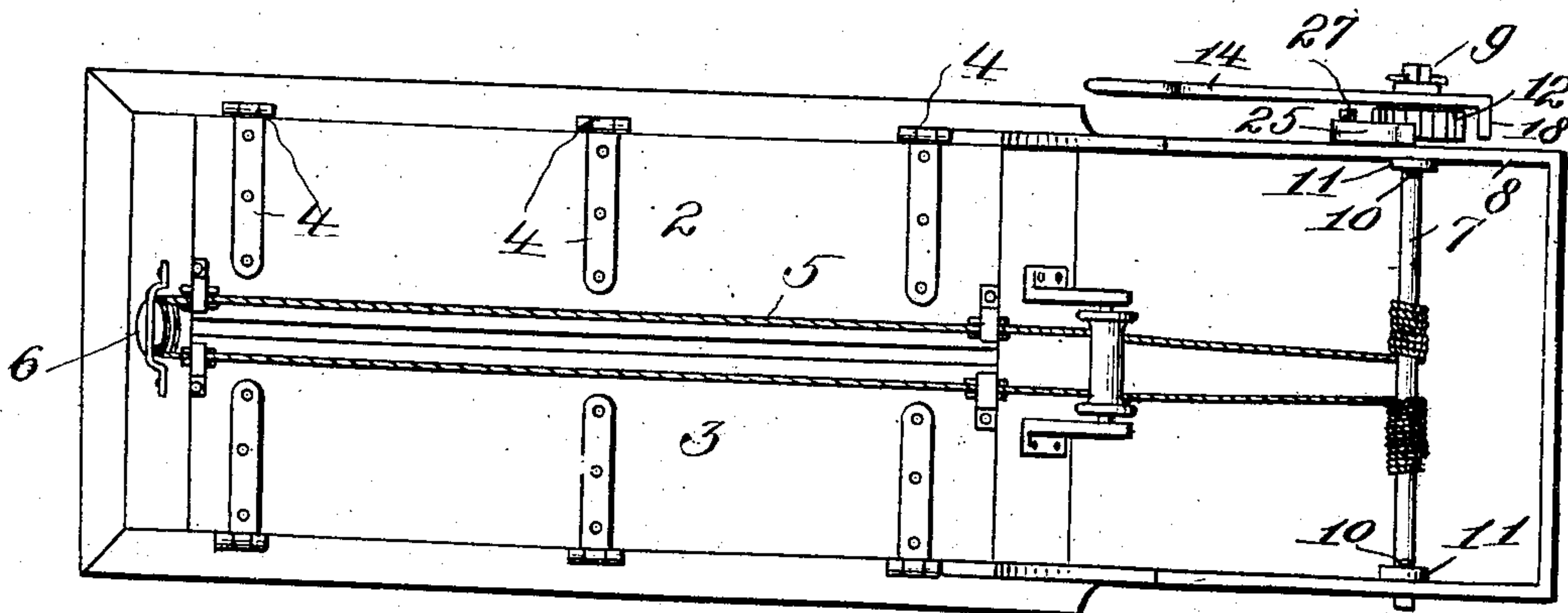


Fig. 2.



Witnesses:
C. D. Kessler
J. B. Kessler

Inventor
August Mertes
By James L. Norris
Att'y.

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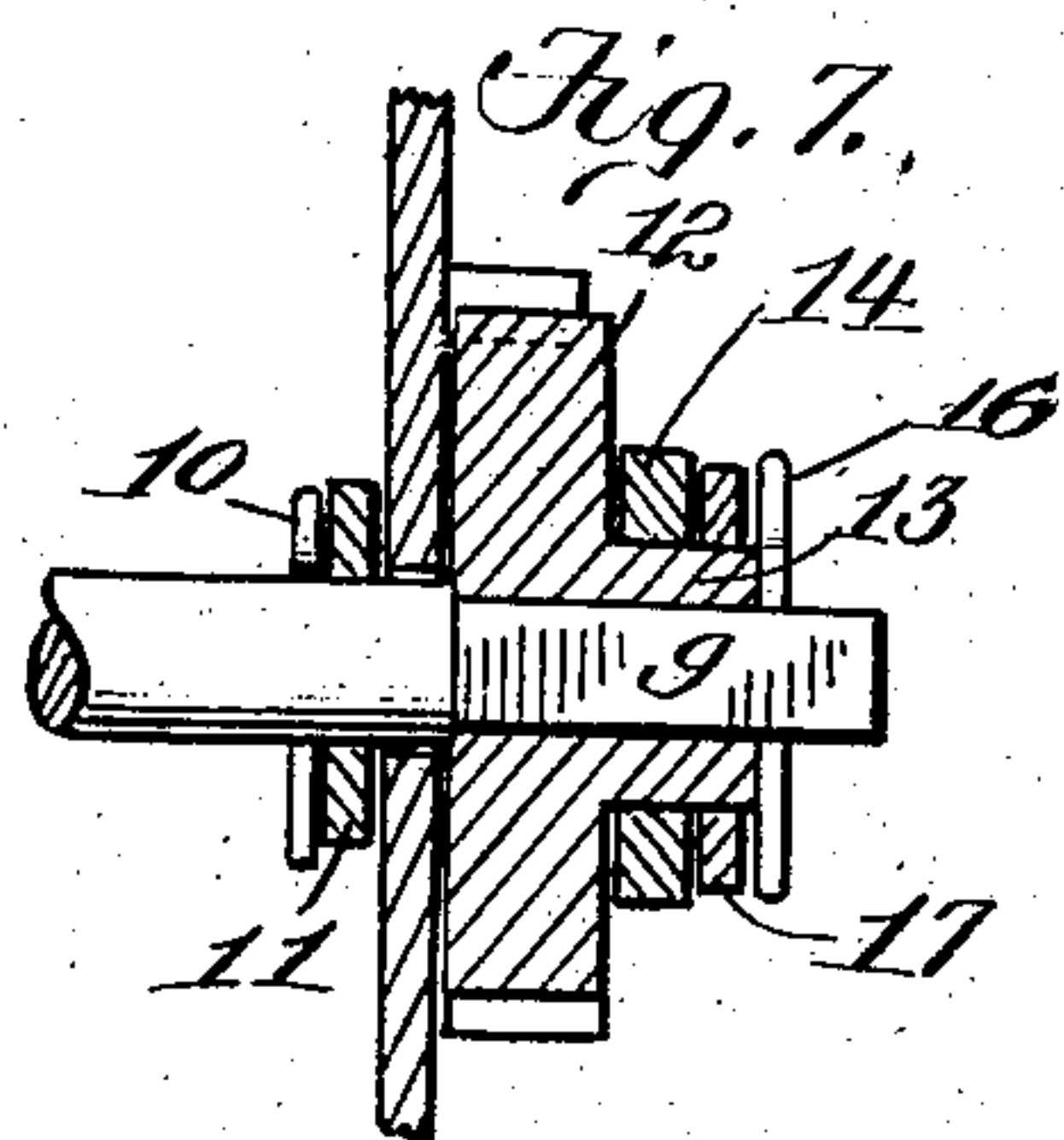
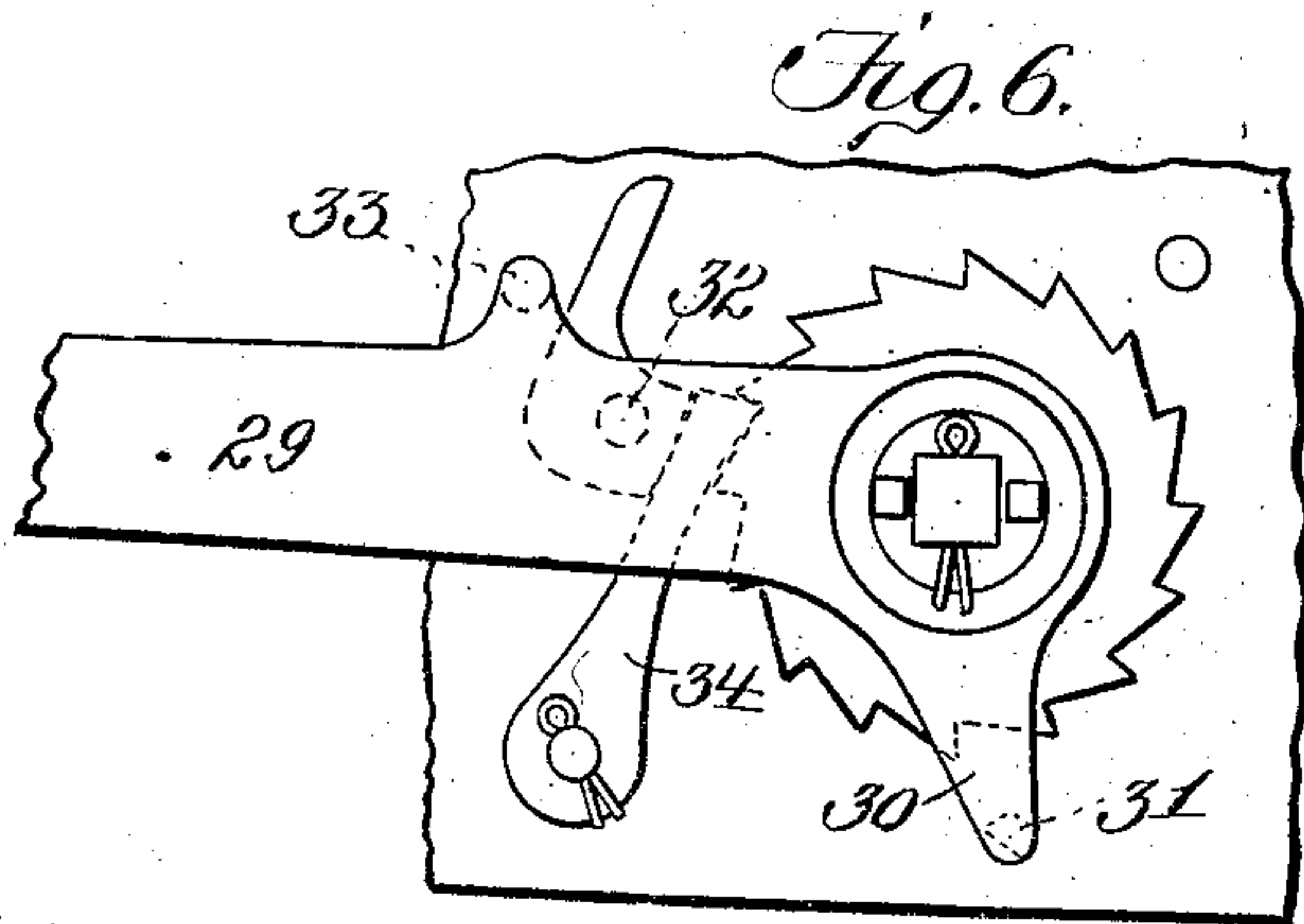
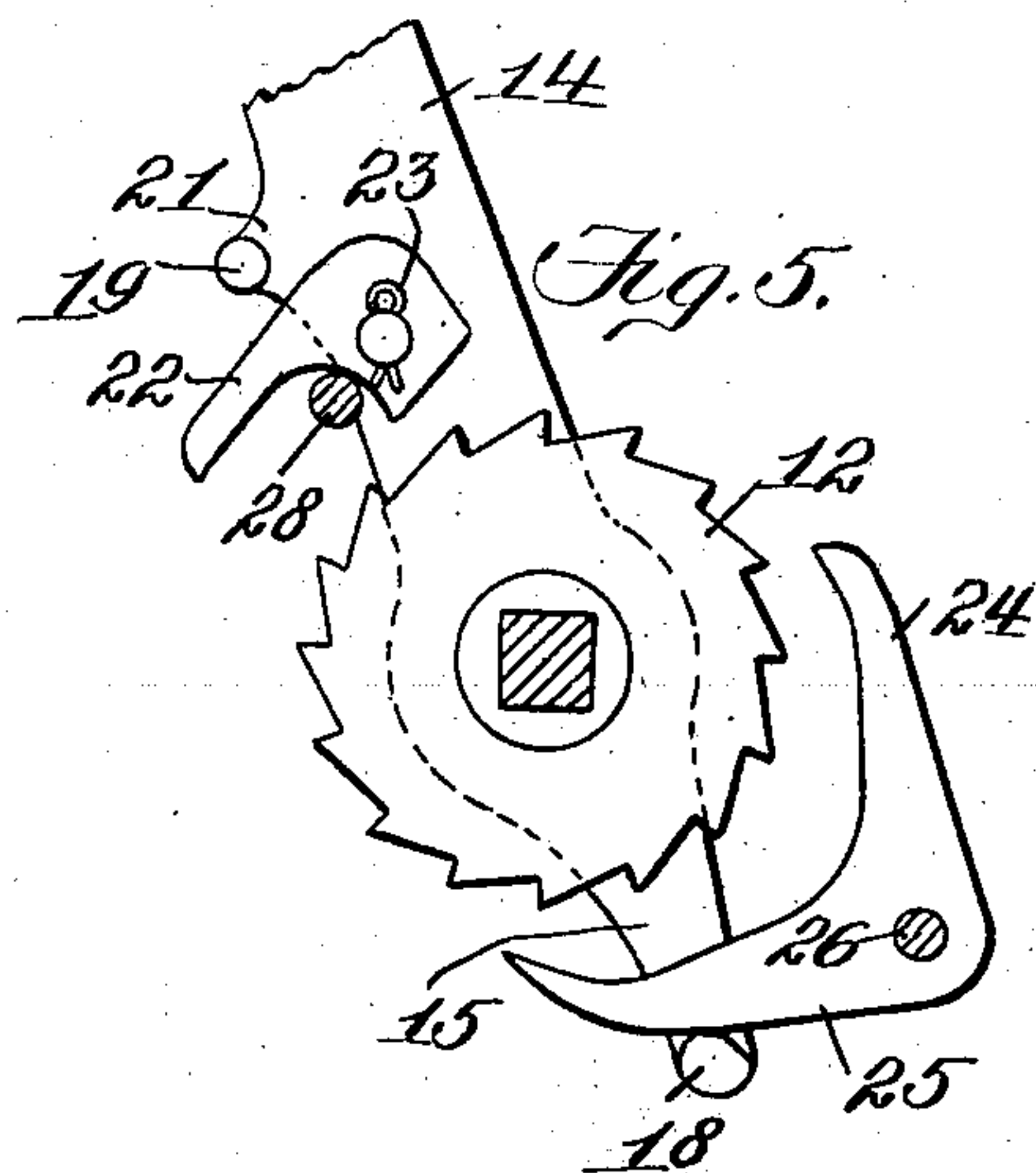
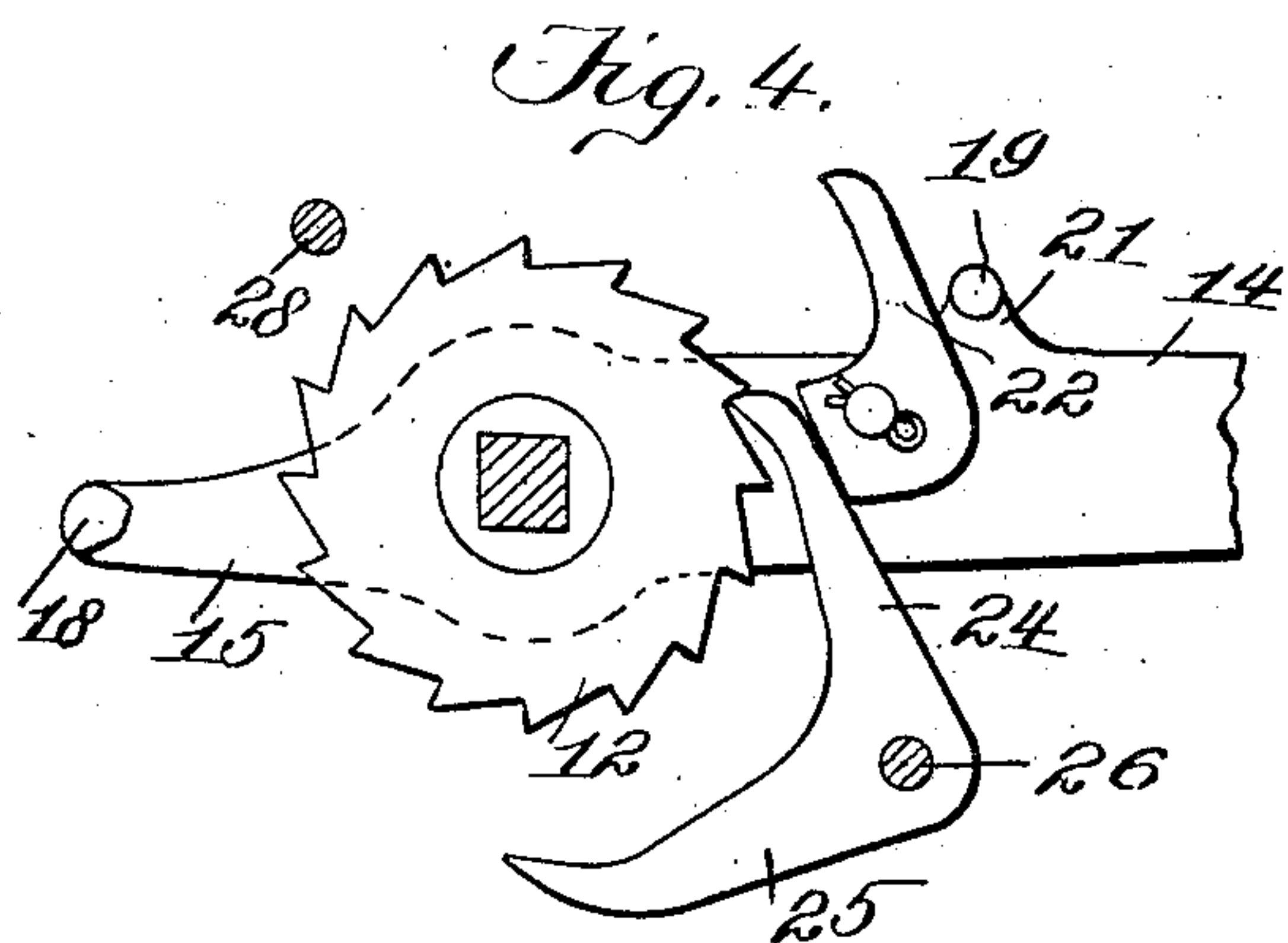
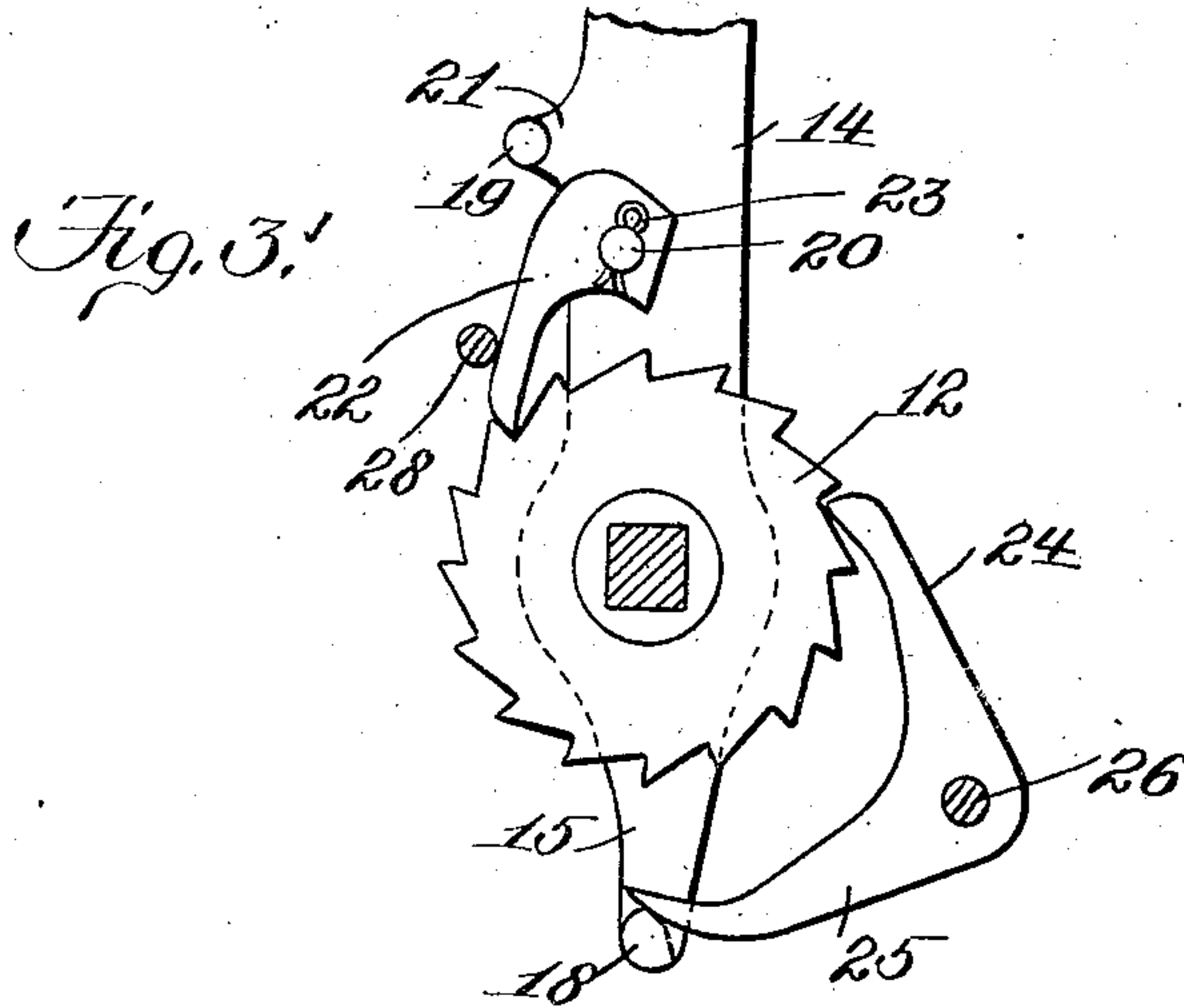
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J. B. Kessler

Inventor
August Mertes
By James L. Norris
Att'y.

UNITED STATES PATENT OFFICE.

AUGUST MERTES, OF EMSWORTH, PENNSYLVANIA, ASSIGNOR TO F. H. HIEBER WAGON MANUFACTURING CO., OF McKEES ROCKS, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PAWL-AND-RATCHET DEVICE FOR DUMPING-VEHICLES.

No. 835,452.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed November 2, 1905. Serial No. 285,600.

To all whom it may concern:

Be it known that I, AUGUST MERTES, a citizen of the United States, residing at Emsworth, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Pawl-and-Ratchet Devices for Dumping-Vehicles, of which the following is a specification.

This invention relates to pawl-and-ratchet devices for dumping-vehicles, and aims to provide a new and improved locking device, hereinafter more specifically referred to, for use in connection with hinged doors or gates of dumping-vehicles.

Although the invention is adapted for use in connection with dumping-wagons, it is also applicable for any purposes for which it is found adaptable—for example, locking gates or doors, hoisting and winding devices, loading and unloading devices, or for other purposes where it is necessary to manually rotate and lock from rotation any rotatable element.

The invention further aims to provide a means for the purpose set forth which shall be simple in its construction, strong, durable, efficient in its use, readily set up, and inexpensive to manufacture.

With the foregoing and other objects in view the invention consists of the novel construction, combination, and arrangement of parts hereinafter more specifically described, and illustrated in the accompanying drawings, which form a part of this specification and wherein is shown the preferred embodiment of the invention; but it is to be understood that changes, variations, and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, wherein like reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 is a side elevation of a portion of a dumping-vehicle, showing a locking device in accordance with this invention in connection therewith. Fig. 2 is a bottom plan of a dumping-vehicle, showing the arrangement of a locking device in accordance with this invention in connection therewith. Fig. 3 is a view looking from one side of one form of a locking device in accordance with this inven-

tion, the operating-lever being broken away. Fig. 4 is a similar view showing the locking-lever moved to inoperative position and the locking-dog retained in position by the operating-pawl. Fig. 5 is a like view with the locking-dog released. Fig. 6 is a view looking to one side of a modified form of locking device in accordance with this invention, and Fig. 7 is a sectional detail.

A locking device in accordance with this invention is shown, by way of example, as set up in connection with a dumping-wagon; but it will be stated that the locking device can be used for any purposes wherein it is found applicable. The illustration in connection with the dumping-wagon is employed to show more clearly the manner in which the device is employed for locking a rotatable element, as shown, the rotatable element being a drum-shaft upon which is adapted to be wound a locking-cable for retaining in position the dumping-bottom of the vehicle.

In the drawings the reference character 1 denotes the vehicle-body, having a dumping-bottom formed of a pair of sections, indicated by the reference characters 2 3 and hinged, as at 4, to the sides of the wagon. These sections 2 3 are held in closure position through the medium of a retaining-cable 5, which passes at one end over a pulley 6, secured to the underneath face of the body 1, and has the ends thereof secured to a drum-shaft 7, journaled in the fore part 8 of the vehicle-body and extending from one side thereof, as at 9. Upon the extending end 9 of the drum-shaft 7 is mounted certain elements of a locking device in accordance with this invention. Although preferably the said certain elements of the locking device are mounted upon the projecting end 9 of the shaft 7 exterior of the fore part 8 of the vehicle-body, yet, if desired, the said certain elements of the device can be mounted upon the drum-shaft 7 within the fore part 8 of the vehicle-body 1. It has been found that the locking device can be more conveniently operated from the exterior of the vehicle than from the interior thereof. The projecting end 9 of the shaft 7 is square in cross-section, so that when the said certain elements of the locking device are mounted thereon and said locking device operated to draw the cable 5 taut said operation of the locking device will cause the

rotation of the drum-shaft 7 and the winding of the cable 5 thereon, thereby drawing said cable taut and retaining the sections of the dumping-bottom in closure position. To prevent the drum-shaft 7 moving laterally or transversely of the fore part 8 of the vehicle-body 1 after said drum-shaft 7 has been placed in position, cotter-pins 10 or other suitable devices extend through the shaft 7 in close proximity to the sides of the fore part 8, and interposed between the cotter-pins 10 and the sides of the fore part 8 are the washers 11.

One form of a locking device for the purpose set forth and in accordance with this invention comprises a ratchet-wheel 12, having one face thereof provided with an extended boss 13, upon which is loosely mounted the operating-lever 14, the normal or inoperative position thereof being such as to extend in a longitudinal direction with respect to the body 1 of the vehicle. The operating-lever 14 is mounted upon the boss 13 in such a manner that the said boss 13 will extend through the lever at a point in proximity to the tapering end 15 of the said lever, thereby forming that portion of the lever on the other side of the boss 13 somewhat elongated, which makes that portion of the lever very heavy, so that the lever will resume its normal or inoperative position by gravity when the operator releases the lever.

The lever 14 is retained upon the boss 13 through the medium of a cotter-pin or other suitable holdfast device 16, which extends through the projecting end 9 of the drum-shaft 7, and also through the medium of a washer 17, which is mounted upon the base 13 and interposed between the cotter-pin 16 and the outer face of the lever 14. The latter is provided with three inwardly-extending lugs 18, 19, and 20. The lug 18 is positioned on the end 15 of the lever 14 and is termed a "shifting-lug," the function of which will be hereinafter referred to. The lug 19 is carried by an offset 21 and is termed a "stop-lug," the function of which will be hereinafter referred to, and the lug 20 is arranged in suitable relation with respect to the lug 19 and constitutes a pivot upon which is mounted the operating pawl or dog 22, having a flattened inner end which is retained upon the said lug 20 through the medium of a cotter-pin or other suitable device 23. The lug 19 acts as a stop for limiting the swinging movement of the pawl or dog 22 in one direction. The pawl or dog 22 is adapted to be moved into engagement with the teeth of the ratchet-wheel 12, so that when the lever 14 is oscillated the pawl or dog 22 will engage and rotate the said ratchet-wheel 12, thereby imparting rotation to the shaft 7 and winding the cable 5 thereon. Back rotation of the ratchet-wheel 12 when it is rotated in one direction through the medium of

the pawl or dog 22 is prevented through the medium of the locking-pawl 24, having a dependent weighted arm 25, whose function is to retain the locking-pawl 24 in engagement with the ratchet-wheel 12. The weighted arm 25 also acts as a shifting means, in a manner as hereinafter referred to, to cause the moving of the locking-pawl 24 out of engagement with the ratchet-wheel 12, so that no resistance will be offered to the rotation of the drum-shaft 7 in a direction opposite to that which is imparted thereto through the medium of the lever 14, pawl 22, and ratchet-wheel 12, thus enabling the weight of the load to automatically open the dumping-bottom of the vehicle.

The locking-dog 24 is pivoted upon the stud 26, projecting outwardly from the portion 8 of the wagon-body, and the said locking-pawl 24 is retained upon the stud 26 through the medium of the cotter-pin 27 or other suitable holdfast device. The pawl or dog 22 not only acts as a means for rotating the ratchet-wheel 12 when the lever 14 is operated, but when the lever 14 is returned to its normal or inoperative position the pawl or dog 22 is adapted to engage in a wedge-like manner the locking-dog 24 owing to the flattened inner end of said dog 22 abutting against one side of the dog or pawl 24. The return of the lever 14 to its normal or inoperative position rotates the pawl 22 on its pivot 20 and causes the pawl or dog 22 to seat itself upon the locking-dog 24, and as the weight of the lever will retain the pawl 22 in such position it is evident that the wedging action of the pawl 22 will securely retain the locking-pawl 24 against a tooth of the ratchet-wheel 12, thereby preventing the release of the drum-shaft 7 until the lever 14 is shifted from normal position, which carries the pawl 22 therewith, or the arm 25 is shifted so as to move the pawl 24 out of the path of the ratchet-wheel 12. The manner in which the arm 25 is shifted so as to release the pawl 24 from engagement with the ratchet-wheel is through the medium of the shifting-lug 18, and in this connection it will be stated that when the lever 14 is operated in one direction the pawl 22 is adapted to rest upon a lug 28, projecting outwardly from the fore part 8 of the wagon-body, and which permits of a greater throw to be given the lever 14, causing the shifting-lug 18 to ride upon the outer face of the arm 25 and at the same time draw the arm 25 toward the ratchet-wheel 12. This action will shift the pawl 24 away from the ratchet-wheel 12, so as to permit of the drum-shaft 7 being rotated in a direction opposite to that which is imparted thereto by the operation of the ratchet-wheel through the medium of the lever, the rotation of the shaft 7 in this contradirection being caused by the weight of the load opening the sections of the dump-

ing-bottom, the latter in their movement carrying the cable therewith, which causes the unwinding of the cable off the shaft 7, and consequently rotating the shaft. The lug 28 not only acts as a means to hold the dog 22 away from the ratchet-wheel, so as to permit of an increased throw for the lever 14 to enable the lug 18 to engage the shifting arm 25, so as to move the locking-pawl 24 out of engagement with the ratchet-wheel 12, but also acts as a means to limit the throw of the lever when the pawl 22 is performing its function of rotating the ratchet-wheel 12. In this connection it will be stated that when moving the lever, with the dog 22, in engagement with the wheel 12 during the travel of the lever 14 and pawl 22 the latter will abut against the lug 28. Consequently said lug 28 will arrest the movement of the lever. The arranging of the lever 14 in a longitudinal position when the lever is moved to normal position causes the dog 22 to extend in a substantially vertical position, so that by a quick throw of the lever 14 the dog 22 will be caused to position itself upon the lug 28, and consequently the lug 18 will engage the arm 25 and shift the dog 24 out of engagement with the ratchet-wheel 12 and release the lock upon the shaft 7. That surface of the dog 22 which contacts with the dog 24 when the lever is returned to normal or inoperative position is somewhat inclined, so as to correspond with the outer surface of the dog 24. This manner of constructing the dog 22 with respect to the dog 24 causes a firm engagement between the dog 22 and the pawl 24 when the lever is moved to inoperative position and prevents the moving of the dog 24 out of engagement with the ratchet-wheel 12 until the lever 14 is shifted to such an extent that the dog 22 will be moved out of engagement with the dog 24.

Another form of a locking device in accordance with this invention is shown in Fig. 6. In connection therewith it will be stated that the difference between the same and the locking device heretofore referred to consists in providing the operating-lever substantially L-shaped and dispensing with the shifting arm for the locking-dog. The lever is indicated by the reference character 29 and the tapering end by the reference character 30. The operating-lever is provided with three lugs 31 32 33, which are positioned upon the lever in the same manner as the lugs 18, 19, and 20 and perform the same function, with the exception of the lug 31, which corresponds to the lug 18. In lieu of the lug 31 engaging with the shifting arm, so as to move the locking-pawl 34 out of engagement with the ratchet-wheel 12, the lug 31 engages directly with the said locking-pawl 34 and shifts the same out of engagement with the ratchet-wheel, thereby releasing the shaft 7. Otherwise than that as stated the construc-

tion, arrangement, and operation of the form shown in Fig. 6 is the same as the locking device shown in Figs. 1 to 5, the same reference characters being applied thereto.

It will be evident from the locking device set up in accordance with this invention that not only is the shaft prevented from rotation through the medium of the locking dog or pawl, but a means is also provided for retaining said locking-dog in its engagement with the ratchet-wheel, this means being the operating-pawl, which is held in contact with the locking dog or pawl through the weight of the operating-lever when the latter is moved to normal or inoperative position. This arrangement prevents the jar of the vehicle from throwing the locking dog or pawl out of engagement with the ratchet-wheel 12. This arrangement overcomes a serious objection existing heretofore in connection with locking devices for dumping-vehicles, for it has been found that unless suitable means are employed to retain the locking dog or pawl in position during the travel of the vehicle, the pawl or dog was liable to be shifted or rather jarred out of engagement with the ratchet-wheel 12 during the travel of the vehicle.

It will also be evident that the locking device in accordance with this invention has as an essential part thereof means for conveniently shifting the locking dog or pawl out of position, so as to readily release the drum - shaft to enable the vehicle to be dumped.

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

1. A locking device for the purpose set forth, comprising a rotatable member, a pivoted dog adapted to engage therewith for intermittently rotating the same and provided with a flattened end, a pawl for preventing back rotation of said member, and an operating-lever carrying said dog and provided with a lug to limit the movement of said dog in one direction and further provided with a lug for moving the pawl out of engagement with said member, said operating-lever when moved to inoperative position adapted to move the said dog so that its flattened end will engage in a wedge-like manner said pawl so as to retain it in operative position.

2. A locking device for the purpose set forth, comprising the combination with a support and a rotatable member carried thereby, of a pivoted dog adapted to engage with said member for intermittently rotating the same when the dog is shifted, a pawl pivoted on said support and adapted to engage said member to prevent back rotation thereof, an operating-lever carrying said dog and provided with a lug to limit the movement of said dog in one direction and further provided with a lug for shifting said pawl out of

engagement with said member, said operating-lever when moved to inoperative position to shift the dog to engage said pawl in a wedge-like manner to retain the pawl in operative position, and means carried by the support for limiting the movement of the lever in one direction and for retaining said dog free of said member.

3. A locking device for the purpose set forth, comprising a rotatable member, a shiftable dog adapted to engage with said member for rotating it in one direction, means for preventing back rotation of said member, and a lever carrying said dog and provided with an offset and having a lug to limit the

movement of said dog in one direction, said lever further provided with a lug adapted to engage said means for moving it out of engagement with said member, said lever when moved to inoperative position adapted to shift said dog to a wedge-like engagement with said means, thereby retaining the said means in operative position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

AUGUST MERTES.

Witnesses:

MARY DEELY,
H. S. LYDICK.