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PAWL AND RATCHET FOR DUMPING BOXES.

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1,112,839. Patented Oct. 6, 1914.

Fig. 1.

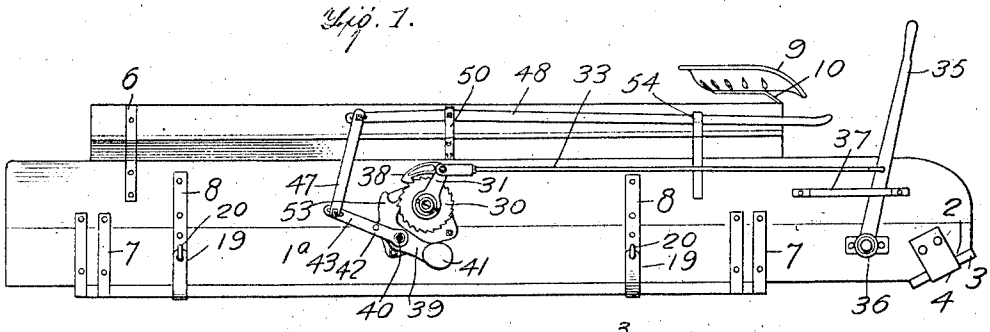


Fig. 2.

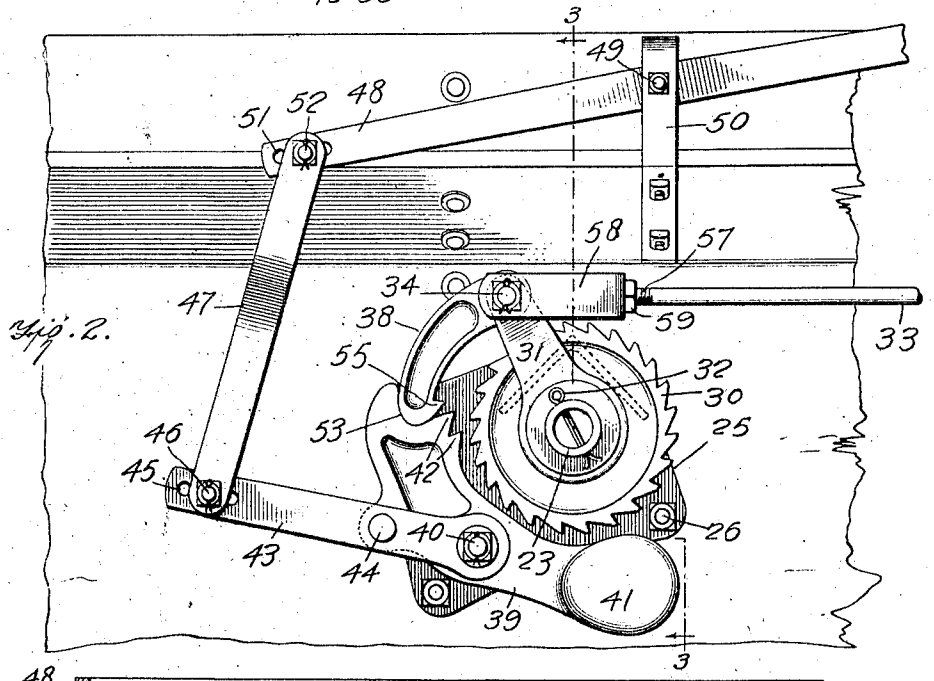
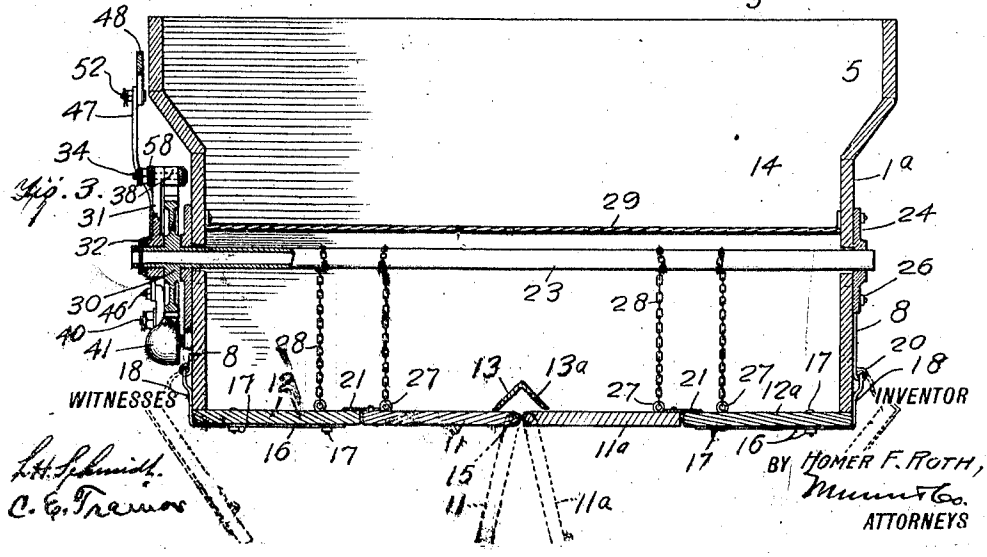


Fig. 3.



WITNESSES

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PAWL AND RATCHET FOR DUMPING-BOXES.

1,112,839. Specification of Letters Patent. Patented Oct. 6, 1914.

Application filed April 3, 1913. Serial No. 759,634.

To all whom it may concern:

Be it known that I, HOMER F. ROTH, a citizen of the United States, and a resident of Sturgis, in the county of St. Joseph and State of Michigan, have made certain new and useful Improvements in Pawls and Ratchets for Dumping-Boxes, of which the following is a specification.

My invention is an improvement in pawls and ratchets for dumping boxes, and has for its object to provide a box of the character specified, adapted to be applied to the running gear of an ordinary wagon, and wherein mechanism is provided for permitting the bottom of the box to be opened into dumping position throughout the entire width of the said box, and throughout the entire length between the axles of the running gear to insure the dumping of the entire contents of the box, and wherein the dumping mechanism is so arranged that the weight of the material dumped insures proper operation of the same.

In the drawings: Figure 1 is a side view of the improved box, Fig. 2 is an enlarged detail of the operating mechanism, and, Fig. 3 is a section on the line 3—3 of Fig. 2.

The present embodiment of the invention comprises a box or bed composed of side or cheek plates 1 and 1^a arranged in spaced parallel relation, and each of the said plates has its front lower corner beveled, as indicated at 2 in Fig. 1, and a cross plate 3 connects the cheek plates at the beveled portions, the said cross plate being held in place by angle plates 4 secured to the cheek plates and to the cross plate.

A hopper shaped extension 5 is connected with the upper edges of the cheek plates, as indicated in Fig. 3, the ends of the said hopper top being extended to the bottom of the cheek plates 1 and 1^a, and forming with the said cheek plates a receptacle whose length corresponds approximately to the distance between the axles of a wagon. The hopper top is secured to the cheek plates my means of straps 6 or the like, while in the present instance the cheek plates are composed of two plates arranged in the same plane, and secured together by straps 7 and 8, the latter straps having an additional function to be presently set forth.

A seat 9 is connected to the front of the hopper top by means of a spring plate 10, and the cross plate 3 serves as a foot board for the driver occupying the seat.

The bottom of the receptacle proper consists of four sections, the said sections extending the full length of the hopper top receptacle, and the said sections are arranged in approximately the same plane to close the full width of the bottom of the bed or box. The said bottom is composed of inner sections or leaves 11 and 11^a, and outer sections or leaves 12 and 12^a. An angle plate consisting of two integral portions 13 and 13^a arranged at a right angle with respect to each other is arranged longitudinally of the receptacle at the center thereof, the said plate being arranged with the apex thereof upward, to deflect the material in the box to each side of the said plate 13—13^a. The innermost sections 11 and 11^a of the bottom are hinged at their ends to the ends of the hopper top receptacle, the rear end being indicated at 14, by means of hinges 15 or the like, the said hinges being arranged at the adjacent edges of the said sections. A strap 16 is arranged transversely of each end of each of the outer sections, the said straps being secured to the said sections by means of bolts 17 or the like, and each of the said straps extends beyond the outer edge of the section and is bent at right angles thereto, as indicated at 18, to form one leaf of a hinge, the other leaves being formed by the straps 8 before mentioned. The free end of the portion 18 of each strap 16 is offset outwardly from the adjacent cheek plate, as shown in Fig. 3, and is provided with an eye, as shown at 19 in Fig. 1. The lower end of each of the straps 8 is provided with a hook 20, as shown in Figs. 1 and 3, the said hook engaging the eye of the adjacent strap 16, to hinge the adjacent section to the cheek plate.

Each of the leaves or sections 11 and 11^a of the bottom has secured to the upper face thereof at the outer edge a plate 21 of metal or the like, the said plate extending beyond the section or leaf, as shown in Fig. 3, to overlap the inner end of the adjacent outer section, to cover and close the space between the inner section and the outer section.

A shaft 23 is journaled transversely of the receptacle at approximately the center thereof, in bearings 24 and 25 arranged on the outer faces of the respective cheek plates

and secured thereto by bolts 26 or the like, and each of the bottom sections 11—11ª—12—12ª is provided with an eye 27, and a chain 28 has one of its ends connected with each eye, the other end winding upon the shaft 23, as shown in Fig. 2, and the chains are of sufficient length to permit the sections or leaves of the bottom to take the dotted line position of Fig. 3.

An angle plate 29 is arranged above the shaft 23, the said angle plate being arranged with its apex above the axis of the shaft, to deflect the material within the receptacle away from the shaft, and said plate is secured to the cheek plates 1 and 1ª in any suitable manner. A ratchet wheel 30 is secured to one end of the shaft outside of the receptacle, and a pawl arm 31 is journaled on the shaft outside the ratchet wheel, the said pawl arm being held in place on the shaft by a cotter pin 32.

A link 33 has one of its ends connected with the upper end of the pawl arm by means of a bolt 34, and the opposite end of the link is pivoted to a lever 35, intermediate the ends thereof, as shown in Fig. 1. The lower end of the lever is pivoted to the cheek plate 1ª as indicated at 36, and a guard iron 37 is secured to the cheek plate between the connection of the link and the pivotal connection 36, to guide the lever and to limit the swinging motion thereof.

A pawl 38 has one of its ends pivoted on the bolt 34, before mentioned, and the free end thereof engages the teeth of the ratchet wheel 30, to move the said ratchet wheel when the pawl arm is operated in a manner to be presently described. A rock lever 39 is pivoted to the bearing plate 25 before mentioned intermediate the ends of the lever, by means of a threaded stem 40 extending laterally from the bearing plate, and one end of the said rock lever is provided with a weight 41, the other end having a plurality of teeth 42 for engaging the teeth of the ratchet wheel.

An arm 43 is rigidly connected with the rock lever, one end of the arm being pivoted on the stem 40 before mentioned, and the said arm is connected to the rock lever by a bolt or rivet 44. The free end of the arm is provided with a longitudinal series of openings 45, and a bolt 46 connects one end of a link 47 with one of the openings of the series. A lever 48 is pivoted intermediate its ends as indicated at 49 to a bracket 50, secured to the receptacle, and the free end of the said lever extends to a point near the seat 10, and near the lever 35. The rear end of the said lever 48 is provided with a longitudinal series of openings 51, and a bolt 52 is provided for connecting the upper end of the link 47 to one of the said openings.

It will be evident from the description that when the front end of the lever 48 is rocked downwardly, the free end of the arm 43 will be moved upwardly, thus swinging the rock lever 39 to cause the teeth 42 to engage with the teeth of the ratchet wheel 30, and that end of the rock lever adjacent to the teeth 42 is provided with a recess 53 for engaging the free end of the pawl 38 to hold the said pawl out of engagement with the teeth of the ratchet wheel, as indicated in Fig. 2, when the said pawl 38 is in the position shown in said figure. A stop or hook 54 is provided on the receptacle, for holding the free end of the lever 48 in lowered position, and to hold the holding teeth 42 in engagement with the ratchet wheel.

In operation, when the bottom sections or leaves are in the dotted line position of Fig. 3, and it is desired to close the said sections or leaves, the lever 35 is vibrated toward and from the driver. The said lever 35 and the operating mechanism for the shaft 23 are arranged on the right side of the receptacle for convenience in manipulation, and in such position that the driver may grasp the lever conveniently. When the upper end of the lever is moved away from the driver, the pawl arm 31 is swung forwardly, and the free end of the pawl 38 is moved out of the recess 53 of the rock lever, and the tooth 55 of the said pawl engages the teeth of the ratchet wheel, thus moving the said wheel forwardly, and partially rotating the shaft 23 in a direction to wind up the chains 28 to close the leaves or sections of the bottom. This movement of the lever 35 is continued, until the said leaves or sections occupy the full line position of Fig. 2, and the said leaves are held in closed position, until it is desired to dump the load, by means of the teeth 42 of the rock lever 39, as shown in Fig. 1. The stop 54 holds the lever 48 with the teeth 42 of the rock lever firmly engaged with the teeth of the ratchet wheel, so that the said ratchet wheel cannot move in a reverse direction.

The plates 21 cover the joints between the innermost and the outermost leaves, and there is no joint between the cheek plates and the outermost leaves, since the said leaves close tightly against the under edges of the said cheek plates.

The shaft 23 is enlarged at the point where the chains 28 wind thereon, as indicated at 56 to cause the chains 28 connected with the innermost leaves or sections to wind at a greater speed than the chains connected with the outermost leaves, thus causing the said innermost leaves to close ahead of the outermost leaves, and to cause the outermost leaves to fit the plates 21 of the innermost leaves.

The link 33 is threaded at its rear end, as indicated at 57, and the said end is threaded into the body of a yoke 58, the arms of the yoke receiving between them both the pawl

arm 31 and the pawl 38, as shown in Figs. 2 and 3, and a lock nut 59 is provided for preventing disengagement of the link and yoke.

During the loading of the box, the parts occupy the position of Fig. 1. When it is desired to dump the load, the lever 35 is swung rearwardly until the pawl 38 rests in the recess 53 of the rock lever, and the lever 48 is released from the hook and moved upwardly. The rock lever is thus swung to release the teeth 42 thereof from the teeth of the ratchet wheel, and at the same time the said rock lever holds the pawl 38 out of engaging position, the said pawl resting in the recess 53, as shown in Fig. 3. The weight of the load now causes the leaves or sections to open, the shaft rotating freely to permit the chains to unwind.

The chains 28 connected with the outer leaves or sections 12 and 12^a are two inches longer than the chains connected with the leaves 11 and 11^a. For this reason the center leaves or sections will close ahead of the outer leaves or sections. The shaft 23 is enlarged by a lug or plate 56 at the points where the chains for the outer leaves or sections wind thereon. The said enlargement is four inches in length and is on the opposite side of the shaft from the point where the chains are fastened. Therefore in winding after the inner leaves or sections have been moved to a point where the plates 21 are on the upper sides of the outer leaves or sections, the excess length in the outer chains will be taken up in winding over the enlargements to cause the leaves or sections to close properly.

It will be noted that that wall of the recess 53 adjacent to the ratchet wheel is inclined to form a cam surface, and that the lower end of the pawl is rounded for coöperating with the cam surface to move the pawl out of engagement with the ratchet wheel when the pawl is moved toward the upper end of the rock lever beyond a predetermined distance.

I claim:—

1. A pawl and ratchet mechanism, comprising a shaft, a ratchet wheel secured to the shaft, a rock lever journaled intermediate its ends below the shaft and having teeth at its upper end for engaging the ratchet wheel to hold the same from reverse movement, said lever being balanced to normally stand in engagement with the ratchet wheel, means for swinging the said lever into or out of engagement with the wheel, a pawl arm journaled on the shaft, means for swinging the said pawl arm toward and from the lever, the arm normally extending upwardly from the shaft, a pawl pivoted at one end to the outer end of the arm and extending toward the upper end of the rock lever, said lever having a recess at its upper end for receiving the free end of the pawl, the wall of the recess adjacent to the ratchet wheel being inclined and forming a cam surface for engagement by the rounded free end of the pawl to move the pawl out of engagement with the ratchet wheel when the pawl is moved toward the upper end of a lever beyond a predetermined distance.

2. A pawl and ratchet mechanism, comprising a shaft, a ratchet wheel secured to the shaft, a rock lever journaled intermediate its ends below the shaft and having teeth at its upper end for engaging the ratchet wheel to hold the same from reverse movement, said lever being balanced to normally stand in engagement with the ratchet wheel, means for swinging the said lever into or out of engagement with the wheel, a pawl arm journaled on the shaft, means for swinging the said pawl arm toward and from the lever, the arm normally extending upwardly from the shaft, a pawl pivoted at one end to the outer end of the arm and extending toward the upper end of the rock lever, the free end of the pawl and the upper end of the lever having engaging means for moving the pawl out of engagement with the ratchet wheel when the said pawl is moved toward the upper end of the lever beyond a predetermined distance.

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Witnesses:
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