

S. J. JOHNSON.
 OPERATING MECHANISM FOR DUMPING CARS.
 APPLICATION FILED JUNE 4, 1908.

900,549.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

Fig. 2.

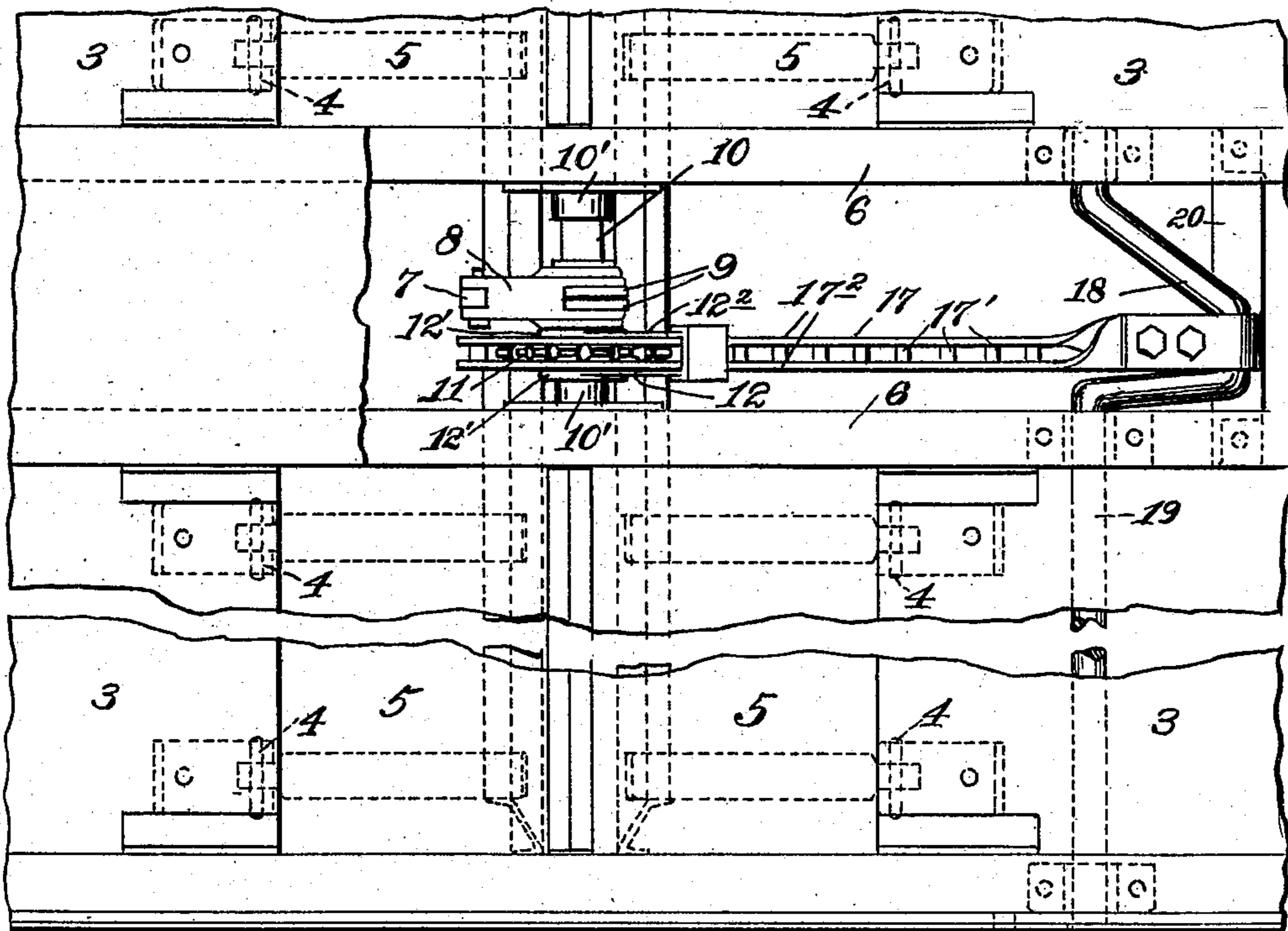
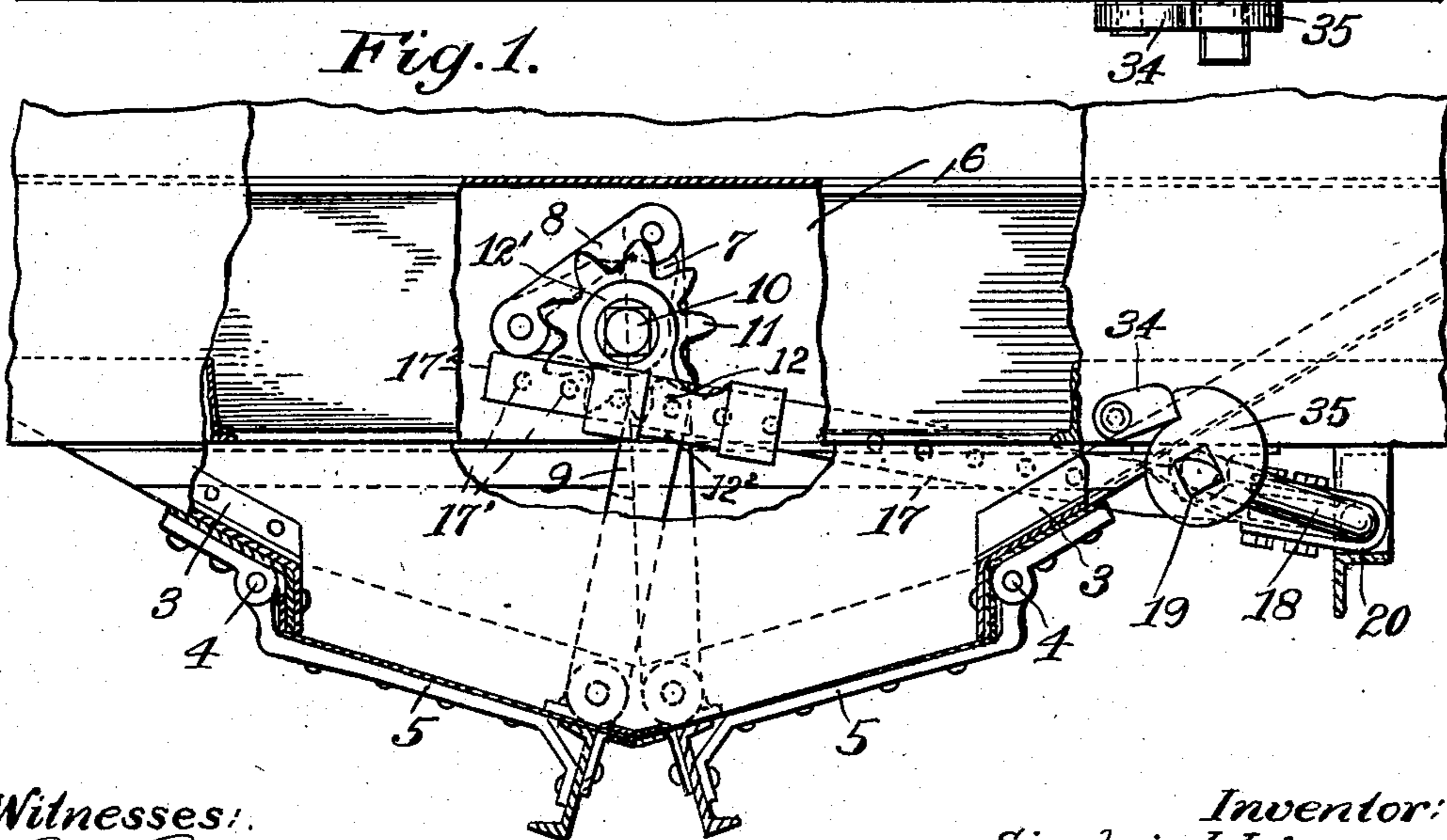


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

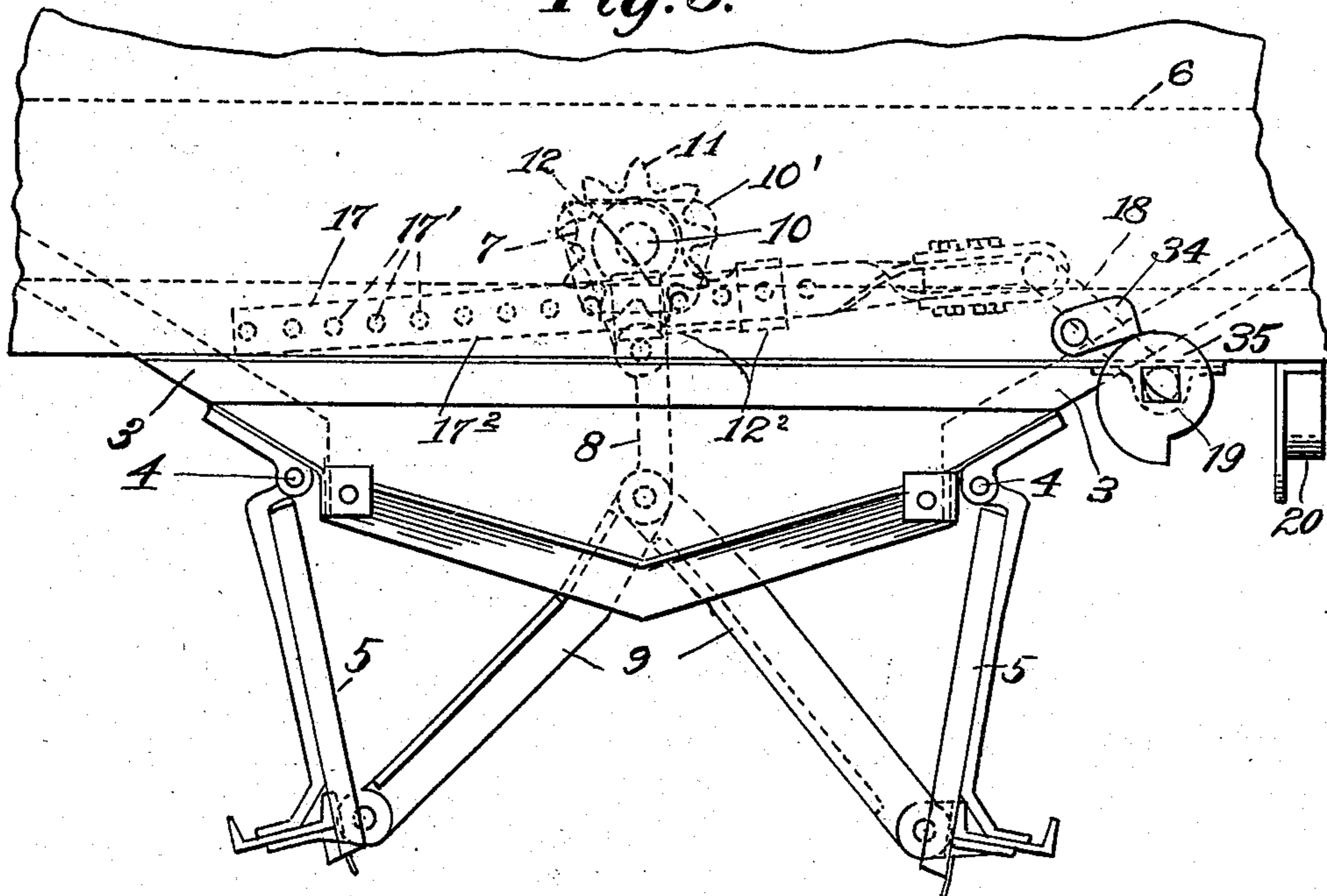


Fig. 4.

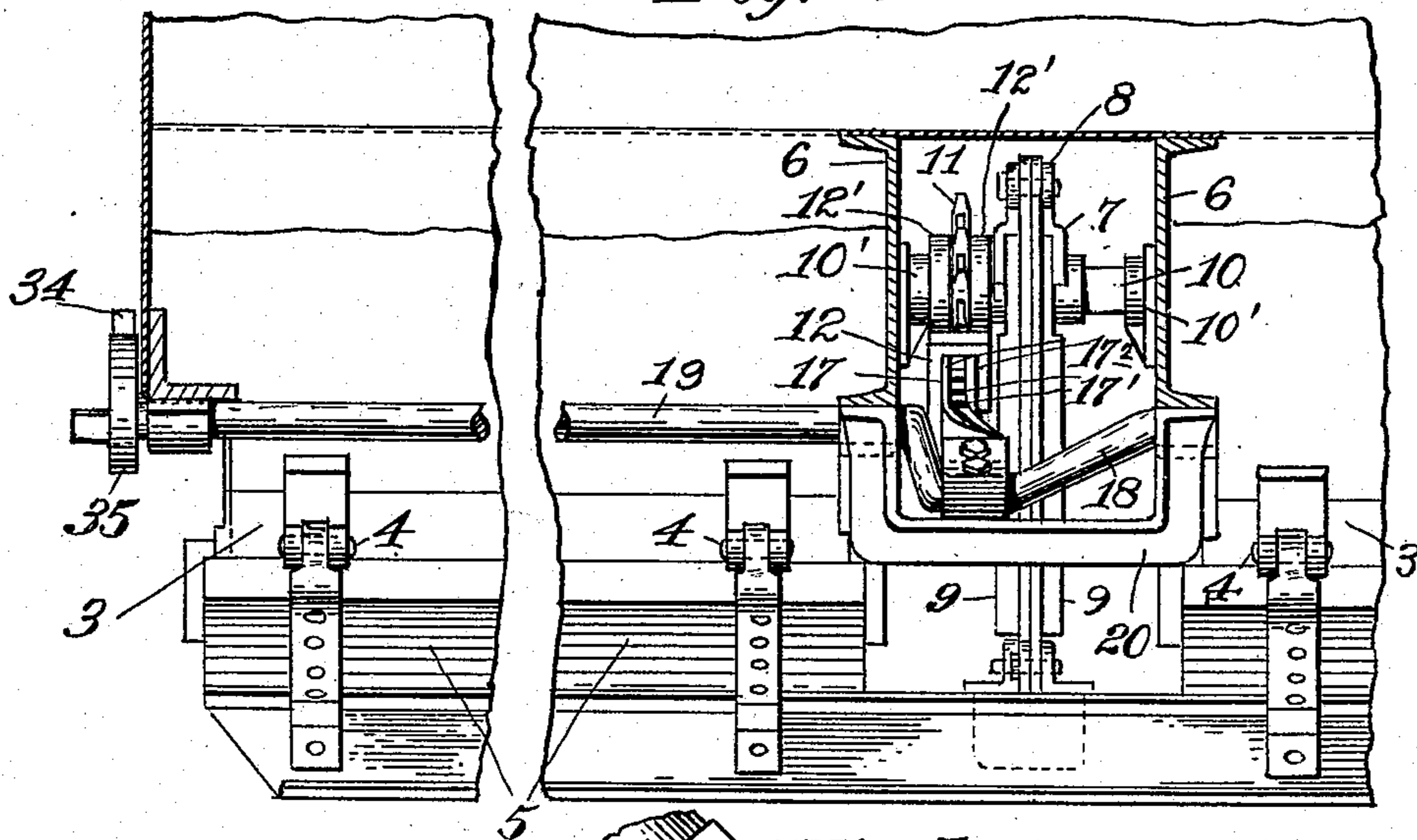
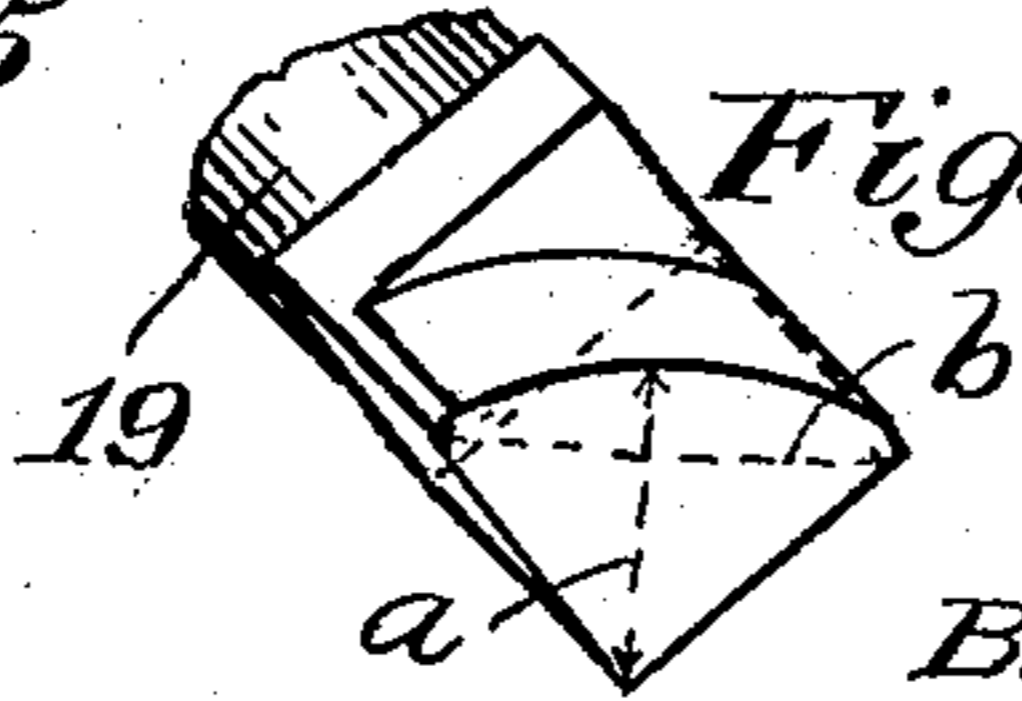


Fig. 5.



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UNITED STATES PATENT OFFICE.

SINCLAIR J. JOHNSON, OF MONTCLAIR, NEW JERSEY.

OPERATING MECHANISM FOR DUMPING-CARS.

No. 900,549.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed June 4, 1908. Serial No. 436,537.

To all whom it may concern:

Be it known that I, SINCLAIR J. JOHNSON, of Montclair, New Jersey, have invented a certain new and useful Improvement in Operating Mechanism for Dumping-Cars, of which the following is a specification.

There is disclosed in my patent of Mar. 29, 1904, No. 755,671, a dumping car door-operating mechanism embodying a pair of links 10 jointed to the dumping doors and connected by a suspension link to an angle lever which during the final door-closing and initial door-opening movements is adapted to swing said suspension link bodily about the axis of the 15 angle lever. The proper operation of the angle lever is in that patent effected from a crank-operated rod through a radius bar jointed at one end to the car body and at the other end to said rod, the latter being also 20 connected by a link to the angle lever.

It is an object of the present invention to simplify the means of transmitting motion from the crank-operated rod to the angle lever of the mechanism referred to the present 25 improvements being also manifestly applicable to the operation of a part in other mechanisms analogous to the disclosed angle lever.

According to the present improvements 30 there is substituted for the aforesaid rod-connected link and radius bar and for a portion of such rod, a rack and pinion movement by means of which an angular actuation of the angle lever, or analogous part, may be readily effected this movement embodying a 35 swiveled rack suspender, in order to retain the rack and pinion in mesh during the crank operation of the rod.

This invention further embraces means for 40 automatically releasing the shaft of the rod-connected crank from the hand-applied wrench when the latter has turned such shaft sufficiently to carry it beyond its locking position and to a position in which the weight 45 of the doors and the load thereon tend of themselves to continue the crank and crank shaft motion thus initiated.

In the drawings accompanying the present specification, Figure 1 is a side elevation of a 50 car, portions being broken away the better to show parts beyond and the doors being in their closed position with the operating parts in their corresponding relative position. Fig. 2 is a plan view of the parts as indicated 55 in Fig. 1, portions being broken away. Fig.

3 is a view similar to Fig. 1 but illustrates the doors as open with the operating mechanism in a corresponding relative position. Fig. 4 is a cross-section of a car representing an elevation of the door-operating mechanism. 60 Fig. 5 is a detail of the crank shaft end.

Similar characters of reference designate corresponding parts in all figures.

The present invention like the invention disclosed in the patent referred to is shown 65 applied to the type of dumping car having a hopper-bottom closed by a pair of doors consisting of two oppositely-swinging leaves. These features like other features in common between the two embodiments are designated 70 in both cases by like characters of reference they being but briefly enumerated herein, reference being had to said patent for a more detailed description of construction and function. That is to say 3, 3 are the slanting car 75 ends, 5, 5 the doors, 4, 4 the door pivots, 6, 6 the longitudinal sills, 7 the part or lever analogous to the angle lever of the patent, 9, 9 the door-connected links and 8 the suspension link of the door-operating mechanism. 80

Suffice it to say in further explanation of the foregoing features that in this instance they may be structurally like or dissimilar to those of the patent, that the shaft 10 to which the lever is secured is mounted in 85 brackets 10', 10' secured to the inside faces of sills 6, 6, and that said lever is actuated from crank 18 of rock shaft 19 by means of an operating bar or rod 17 extending lengthwise through the space between the sills as 90 before.

The present invention provides a rack and pinion movement for transmitting motion from this rod to shaft 10 of the lever, this movement here embodying a pinion 11 on 95 the shaft, meshing with a rack on bar 17. Bar 17 may be conveniently in the form of a rack bar with pin teeth, see pins 17' extending between side rods 17², 17². Rack bar 17 is reciprocated to and fro, as already explained by crank 18, and in order to hold the rack bar in engagement with the aforesaid pinion during the angular relation resultant from the crank operation, the bar is slidably 100 mounted in a suspender 12 swiveled on shaft 10. As here constructed this swivel rack guide or suspender includes side parts 12', 12' which are journaled to shaft 10 on opposite sides of pinion 11, the said parts being connected by a tangential part 12² longitudinally 110

of which the rack bar may slide with the pins thereon properly engaged with the pinion teeth. Crank 18 may cooperate with a stop 20 as in the patent while as shown an additional or safety locking device may be provided, see pawl 34 and ratchet 35.

An additional feature of the present improvements relates to means for automatically releasing rock shaft 19 from a hand crank or wrench after the person has thereby turned the rock shaft sufficiently to raise crank 18 to a point where the weight of the parts become instrumental to continue the movement of the rock shaft with a shock liable to jerk the hand crank forward in an undesirable manner. The means here shown for the purpose comprise a squared end on shaft 19 a portion of such end axially of the shaft being removed to adapt the engagement with such end of a hand crank and an operation in the manner described. The portion cut off is sufficient to shorten one diagonal of the square to an extent that renders that diagonal inoperative to effect the turning of the shaft by the wrench. That is to say, as thus formed, with a portion of one angle of the square removed, when a wrench is applied to the shaft end to open the doors, or in other words to turn the shaft to the left in Fig. 1, the diagonal *a* of the square or rectangle being less than the diagonal *b*, and equal to or less than the opening of the wrench, see Fig. 5, will permit the shaft to free itself from the wrench after the crank has passed the dead center and the weight of the parts become instrumental to turn the shaft.

It will be readily understood that to turn the shaft in the opposite direction, or in other words to close the doors the wrench must be applied to the shaft end in such manner as that the foregoing principle applies; crank 18 after passing its dead center ultimately comes to rest against stop 20 as explained in the aforementioned patent.

Having described my invention, I claim;

1. The combination with a car door and operating mechanism therefor including a lever, of a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, and means for insuring the engagement of the rack and pinion in all positions assumed by the crank actuated rack bar.

2. The combination with a car door and operating mechanism therefor including a lever, of a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a rack bar suspender having a swiveled relation to said pinion.

3. The combination with a car door, of an operating lever having a link connection therewith, a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a rack bar suspender having a swiveled relation to said pinion.

4. The combination with a car door, of an operating lever having a link connection therewith embodying a link adapted for a portion of the door-opening and closing movements to be swung bodily by said lever, a rack bar and a pinion rigid with said lever and with which said rack bar engages.

5. The combination with a car door of an operating lever having a link connection therewith embodying a link adapted for a portion of the door opening and closing movements to be swung bodily by said lever, a crank operated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a rack bar suspender having a swiveled relation to said pinion.

6. The combination with a pair of hopper doors, of an operating lever, a pair of links jointed together and to the swinging edges of the doors, a suspension link connecting the joint between said pair of links to said lever and adapted for a portion of the door opening and closing movements to be swung bodily by said lever, a crank operated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a rack bar suspender having a swiveled relation to said pinion.

7. The combination with a car door, of operating mechanism therefor including a lever, a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a stop 20.

8. The combination with a car door, of operating mechanism therefor including a lever, a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, a rack bar suspender having a swiveled relation to said pinion, and a stop 20.

9. The combination with a car door of an operating lever having a link connection therewith embodying a link adapted for a portion of the door opening and closing movements to be swung bodily by said lever, a crank operated rack bar, a pinion rigid with said lever and with which said rack bar engages, a rack bar suspender having a swiveled relation to said pinion, and a stop 20.

10. The combination with a car door, of mechanism for operating the same including a rock shaft, said rock shaft having a squared end with a portion of one angle of said square removed substantially as and for the purpose specified.

11. The combination with a car door, of an operating lever link connected to the door, a pinion rigid with said lever, a rack bar engaging with said pinion, and a rock shaft to which said rack bar is crank connected, said rock shaft having a squared end with a portion of one angle of said square removed substantially as and for the purpose specified.

12. The combination with a car door and

operating mechanism therefor, including a lever, of a crank actuated rack bar, a pinion rigid with said lever and with which said rack bar engages, and a rack bar suspender
5 embodying a tangential part constituting a guide for said rack bar.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

SINCLAIR J. JOHNSON.

Witnesses:

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J. R. FRITH.