

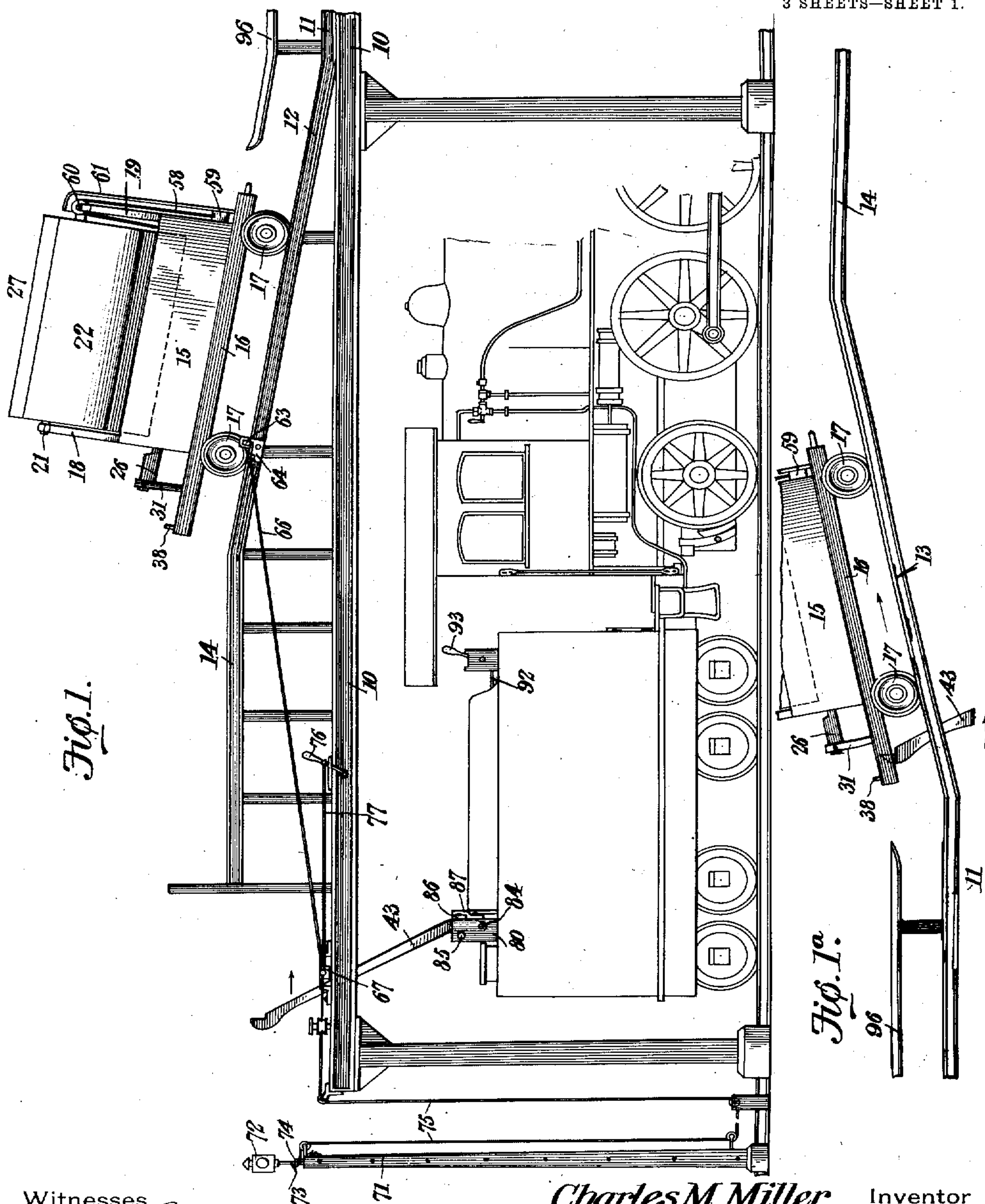
No. 811,425.

PATENTED JAN. 30, 1906.

C. M. MILLER.  
COALING DEVICE FOR MOVING TRAINS.

APPLICATION FILED JULY 3, 1905.

3 SHEETS—SHEET 1.



## Witnesses

E. F. Stewart  
Jno E Parker

*Charles M. Miller*

Inventor

by

Chas. Snow

## Attorneys

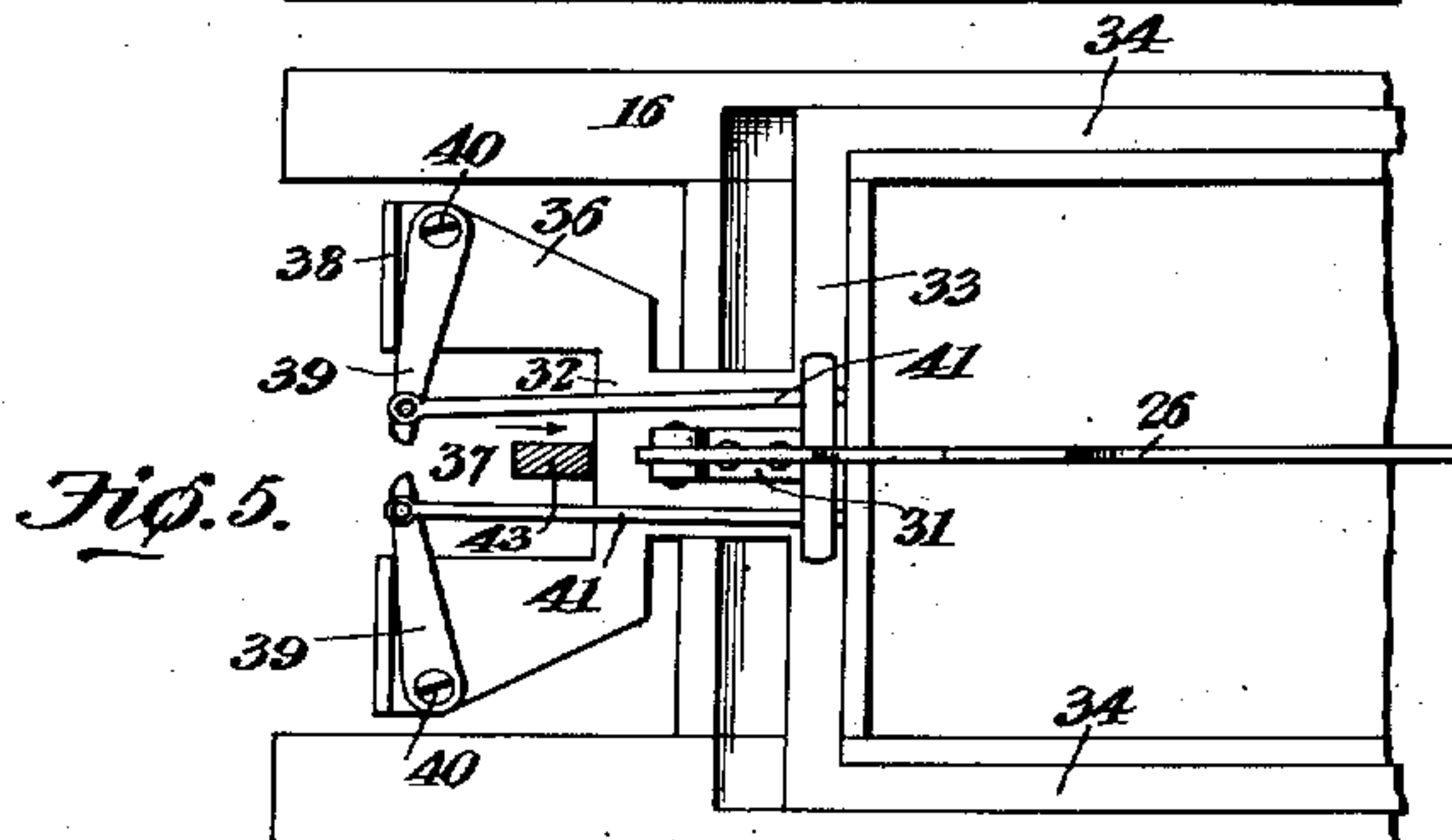
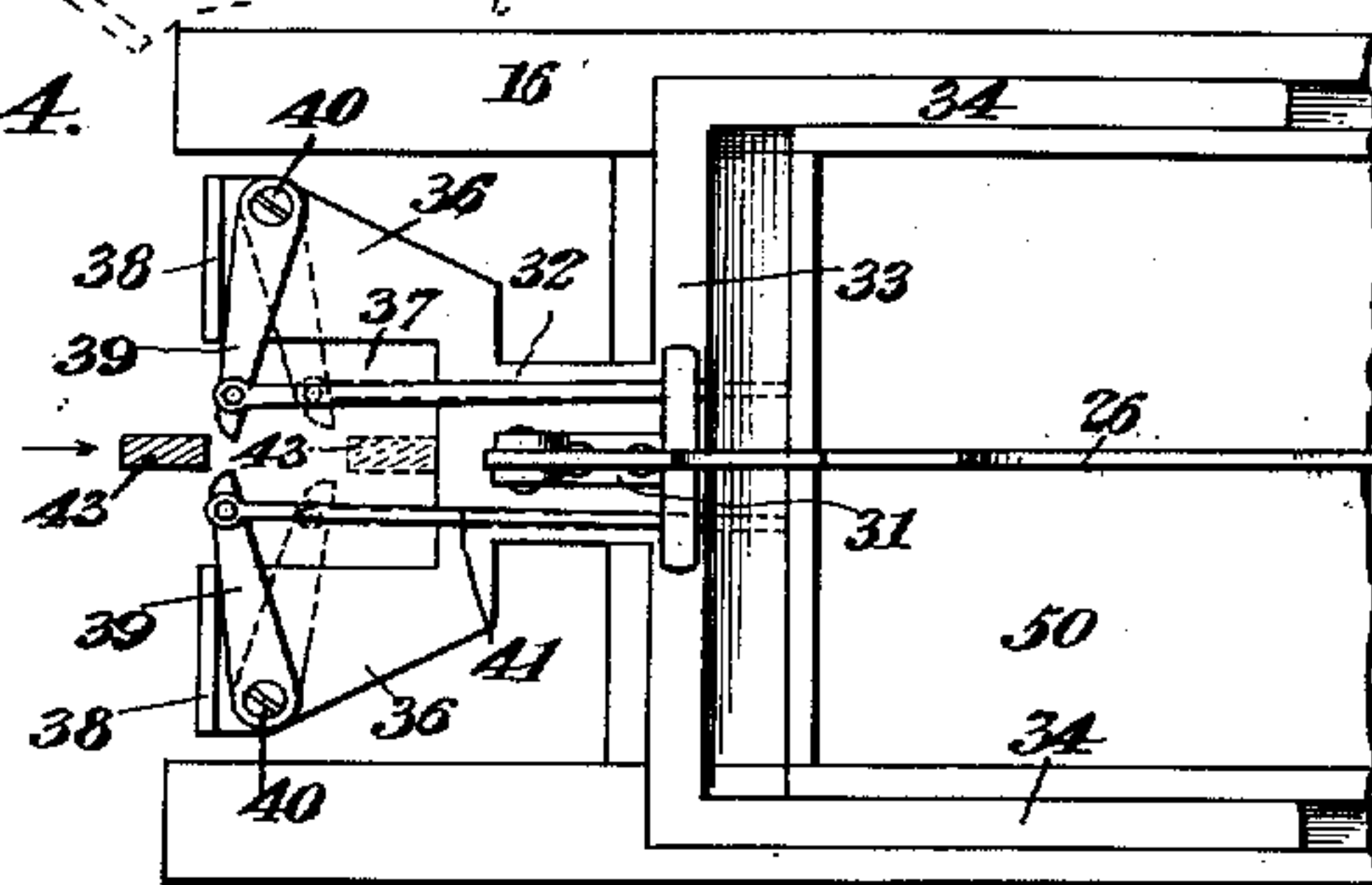
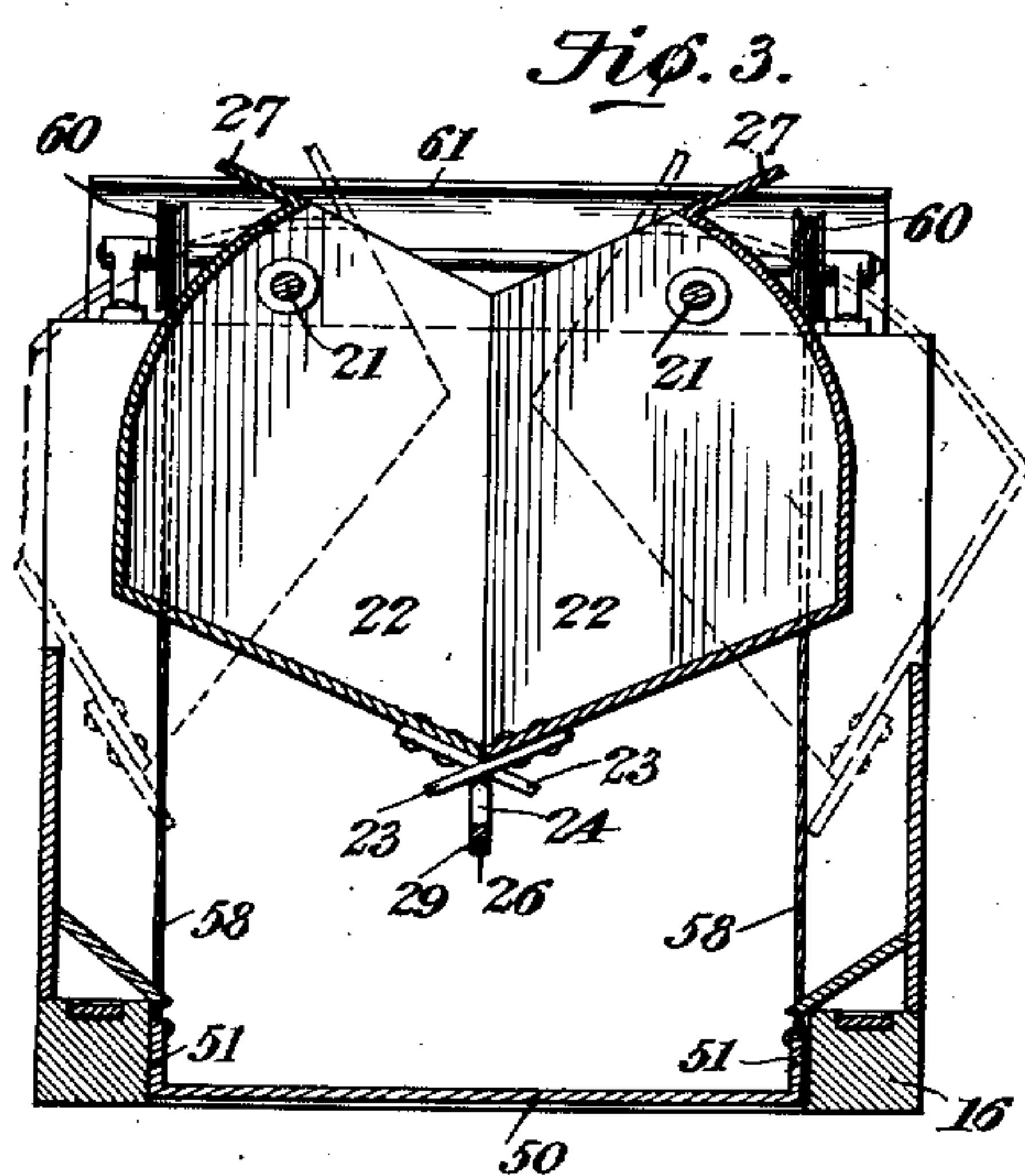
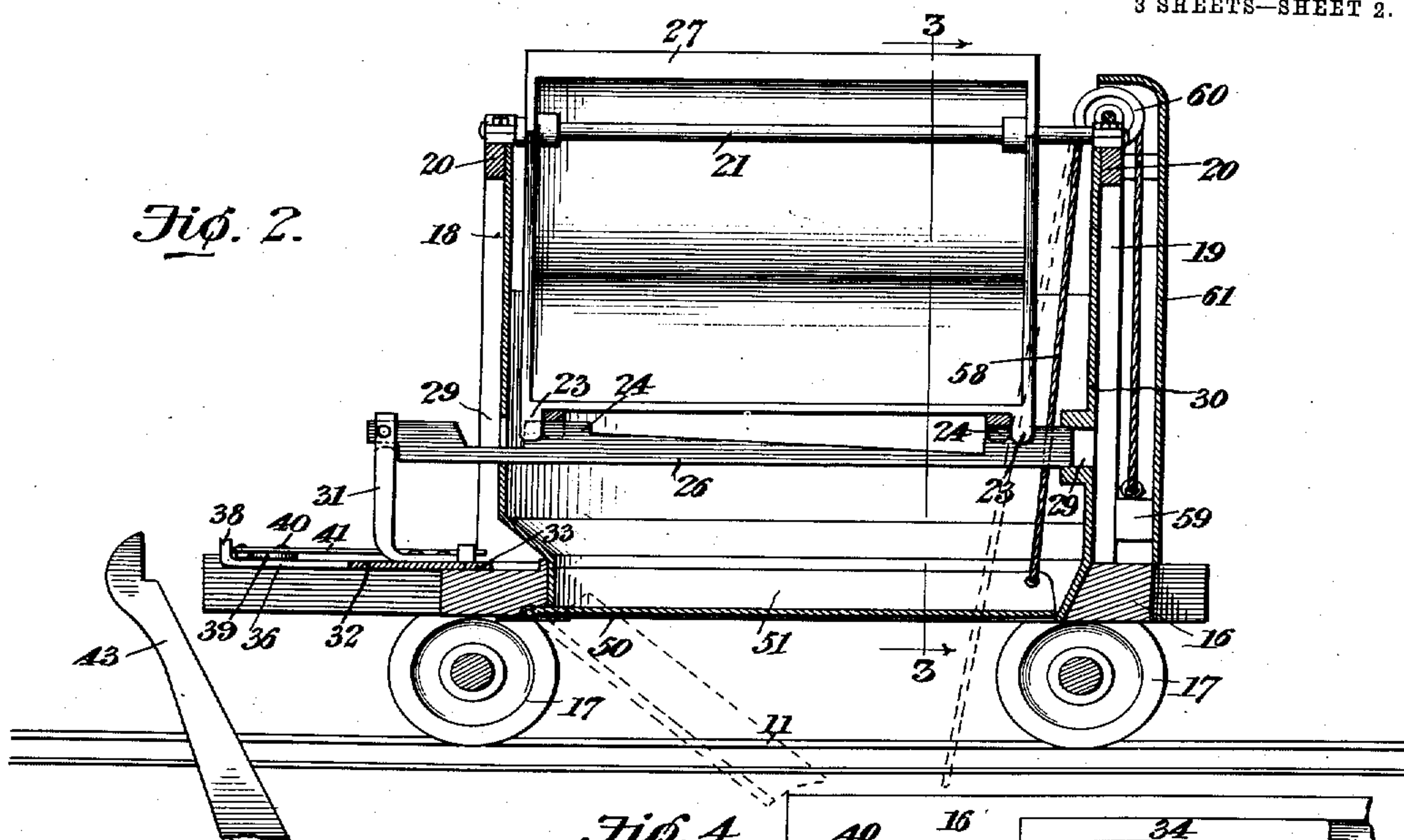
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by *Chas. M. Miller*  
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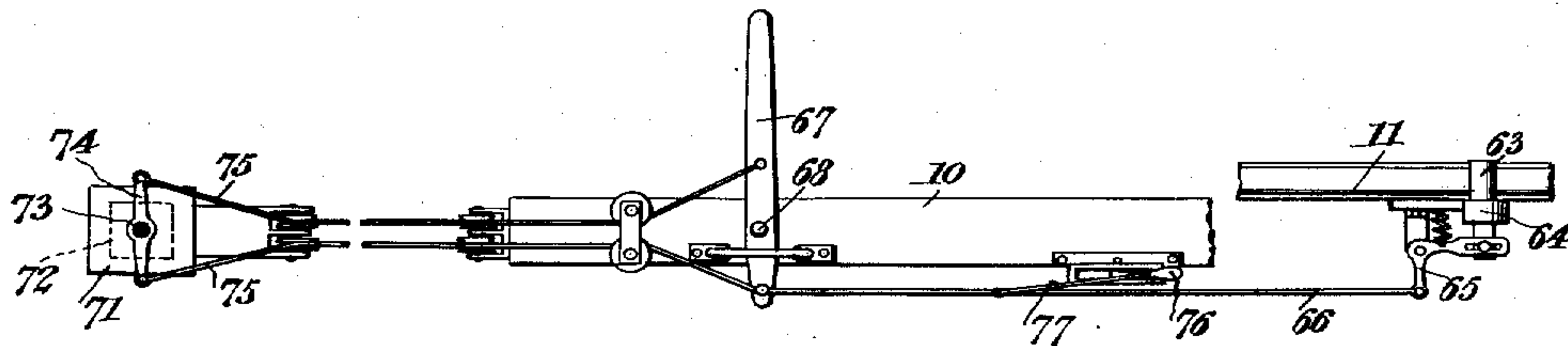
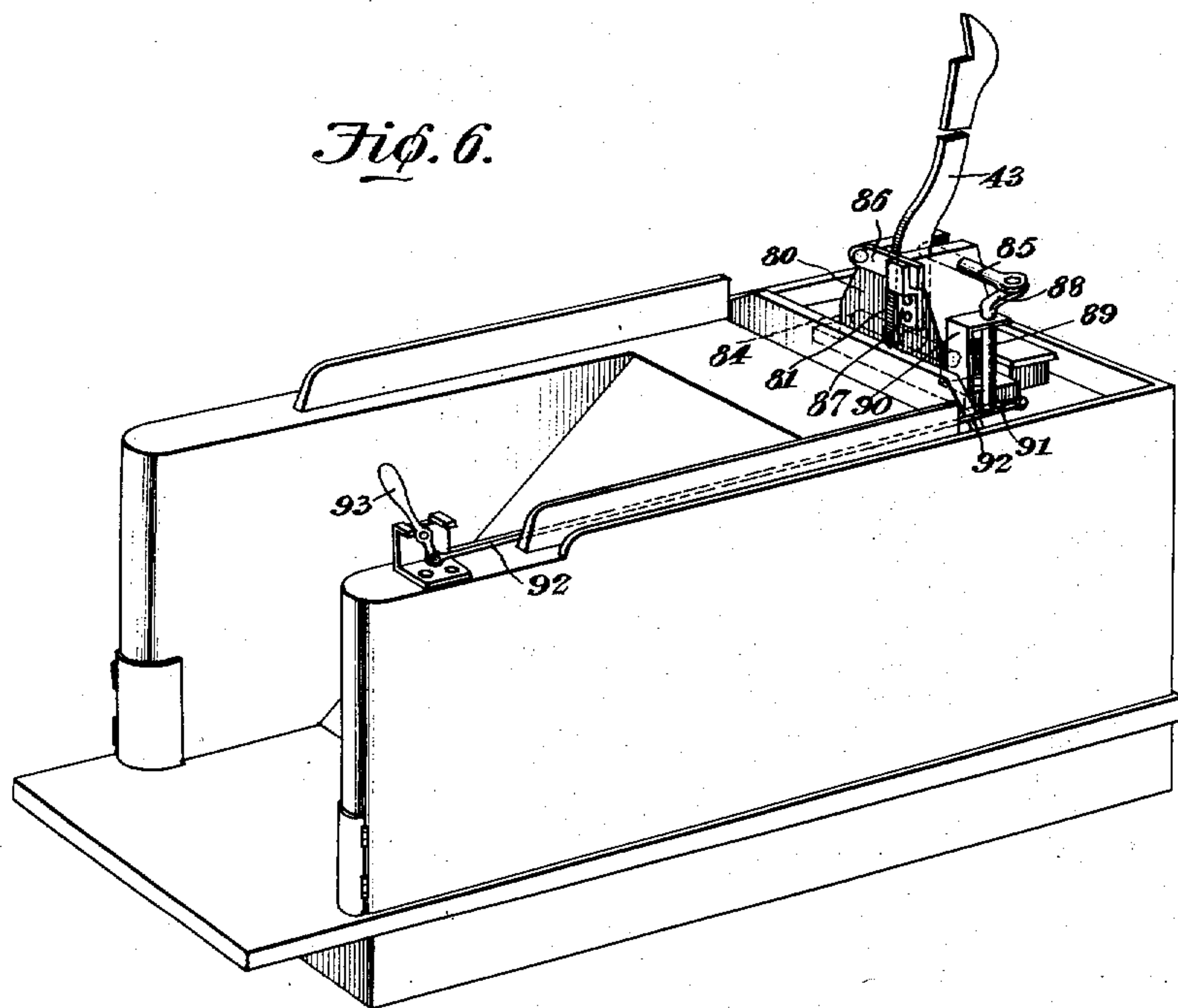
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3 SHEETS—SHEET 3.

*Fig. 6.*



*Fig. 7.*

Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES M. MILLER, OF TYRONE, PENNSYLVANIA.

## COALING DEVICE FOR MOVING TRAINS.

No. 811,425.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed July 3, 1905. Serial No. 268,081.

*To all whom it may concern:*

Be it known that I, CHARLES M. MILLER, a citizen of the United States, residing at Tyrone, in the county of Blair and State of Pennsylvania, have invented a new and useful Coaling Device for Moving Trains, of which the following is a specification.

This invention relates to mechanism for supplying fuel to moving trains, and has for its principal object to provide a device that will automatically dump any desired quantity of fuel into a locomotive-tender while the train is traveling at any speed.

A further object of the invention is to provide a device of this character in which the approaching train is warned of the fact that the apparatus is in readiness to supply fuel, and, further, to so arrange the mechanism that the engineer may pass the coaling-station without taking fuel, if he so desires.

A still further object of the invention is to provide a coaling device in which a movable dumping-car arranged on an elevated track is set into motion on the approach of the locomotive and in the advance of the arrival of the locomotive at receiving position, so that the dumping-car will acquire a velocity approximately equal to that of the train to which coal is to be supplied and the load dumped with the same facility as though the car and train were at a standstill.

A still further object of the invention is to provide an elevated and movable dumping-car so arranged as to be temporarily engaged with the locomotive-tender to insure its traveling at the same speed during the dumping operation and to provide means for automatically disengaging the tender from the car after the load has been dumped.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a side elevation of a coal-supplying apparatus constructed in accordance with the invention. Fig. 1<sup>a</sup> illustrates in elevation the

right-hand end of the elevated track, being practically a continuation of Fig. 1 and showing also the manner in which the emptied car ascends the grade and is freed from the train-carried member. Fig. 2 is a sectional elevation of the dumping-car on an enlarged scale. Fig. 3 is a transverse sectional view of the car on the line 3 3 of Fig. 2. Figs. 4 and 5 are plan views of portions of the car with the parts in different positions. Fig. 6 is a detail perspective view of a locomotive-tender, showing the means for engaging the dumping-car. Fig. 7 is a plan view showing the connection between the car-locking device and the signal.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In carrying out the invention an elevated structure 10 is arranged at the coaling-station and is provided with suitable tracks, switches, turn-tables, &c., for handling the dumping-cars. This elevated structure is provided with horizontal tracks 11, at the opposite ends of which are inclined tracks 12 and 13, respectively, these tracks running to elevated tracks 14, on which the filled dumping-car is received and on to which it is delivered after the dumping operation. The car runs from the elevated rails 14 down the inclined rails 12, acquiring momentum approximately equal to the speed of travel of the train, and during its travel along the horizontal track 11 the dumping occurs, after which the car is pushed up the inclined rails 13, Fig. 1<sup>a</sup>, and delivered to the elevated rails or tracks 14.

The cars 15 are provided with suitable sills 16 and supporting-wheels 17, the axles of which may be connected to the sills in any suitable manner. Extending vertically from the opposite ends of the sills are frames or standards 18 and 19, serving as supports for transverse bars 20, having bearings for the reception of the end portions of shafts or spindles 21, on which are hung the two members of a sectional bucket 22. These bucket members have inclined bottom portions, provided near their opposite ends with extended fingers 23, arranged to pass over lugs 24, that are carried by a longitudinally-movable release-rod 26, the lugs passing between the fingers of each pair and serving normally to maintain the sections of the bucket in closed position. When in this position, the upper



edges of the bucket members are flared outwardly, as indicated at 27, forming a convenient hopper-like entrance into which the coal may be directed, the cars being filled from a chute or by hand, if desired.

The release-bar 26 is slidably mounted in guiding-openings 29, formed in end plates 30, that are carried by the standards 18 and 19, and the outer end of the bar is connected to a vertical arm 31, carried by a frame 32. This frame includes a cross-bar 33 and side bars 34, arranged in suitable guiding-grooves formed in the upper faces of the sills 16, and the rear end of the frame is laterally extended to form a pair of arms 36, spaced from each other by a suitable recess 37. The outer ends of the arms 36 are provided with vertically-extending flanges 38, that form stops for limiting the outward movement of a pair of guiding-fingers 39, fulcrumed at 40 to the arms. These guiding-fingers are provided with curved cam-faces at their adjacent free ends and are connected to rods 41, which when the fingers are moved inward to the dotted-line position shown in Fig. 4 will engage against a fixed stop in order to limit inward movement of said fingers. The fingers 39 serve merely as a means for properly guiding an actuating-arm 43, that is carried by the locomotive-tender, and when this arm approaches the position shown in Fig. 4 it may be a little to one side of the same and may engage with only one of the fingers 39. In that case it will force the finger 39 inward, and, riding against the curved end thereof, will be directed to a central position and will engage against the central portion of the wall of the recess 37, striking the frame 32 and moving the same inward. This movement is transmitted through the arm 31 to the release-bar 26, and the latter moves to an extent sufficient to clear the lugs 24 from the fingers 23, whereupon the buckets move to open position by gravity and the contents will be delivered to the tender.

To the rear transverse sill of the dumping-car is pivoted a metallic chute 50, having side flanges 51, the forward ends of which are connected by flexible cables 58 to a counterweight 59. The cables are guided over suitable sheaves 60, and the counterweight is arranged between the standards 19 and the outer plate 61 at the forward end of the car. The counterweight is sufficient to maintain the chute in the horizontal closed position when empty; but when the bucket is dumped the weight of the coal striking against the chute will move the latter downward approximately to the position shown by dotted lines in Fig. 2, and the coal will be properly guided to the coal-box of the tender.

When a car is placed in position near the top of the inclined track 12, it is held from movement by a chock-bar 63, adapted to a suitable guiding-opening formed in a small

bracket 64 at the side of the track. The outer end of this chock-bar is connected by a bell-crank lever 65 to one end of a cable 66, the opposite end of which is connected to one end of a lever 67, fulcrumed on a pin 68, that is carried by one of the bars of the elevated structure. The outer end of the lever 67 is disposed in the path of movement of the actuating-arm 43 on the tender, and when said arm comes into contact with the lever 67 the chock will be withdrawn from contact with the wheel of the dumping-car, allowing the latter to start on its downward movement, and thus accumulate sufficient momentum to approximately equal the speed of travel of the locomotive by the time the latter has caught up with it.

At any suitable distance from the elevated structure—say a hundred yards or more—is a signal-post 71, carrying a signal 72 of any desired character, said signal being disposed at the upper end of a revoluble shaft 73, adapted to suitable bearings at the top of the signal-post. This shaft carries a pair of diametrically-extending arms 74, that are connected by cables or chains 75 to a lever 67, the connections with the latter being at a point on opposite sides of the fulcrum-pin 68. These cables or chains are guided over suitable sheaves of any desired number and are so arranged that when the lever 67 is in operative position—that is, at a right angle to the track—the signal will be in a position to notify the engineer that a load of coal is waiting. When turned to effect the release of a car, the lever 67 will move the signal 72 to notify the engineer that no load is ready. The resetting mechanism for readjusting the chock-block and the signal takes the form of a lever 76, that is arranged at a suitable point on the elevated structure and connected by a cable 77 to the lever 67, this lever being moved in order to readjust the chock and the lever 67 to operative position.

At the rear end of the tender is arranged a vertically-disposed bracket 80, having a central slot 81 for the reception of the lower end of the arm 43, the latter being pivotally mounted on a transversely-extending pin 84, and its rearward movement being limited by a stop-pin 85. Forward movement of the arm may be prevented by an adjustable locking-lever 86, that is thrown across the front of the slot and held in place by a small standard 87. This lever, however, may be thrown backward in order to allow the arm 43 to drop over the tender and remain in inoperative position when it is not desired to take coal.

The pin 85, hereinbefore referred to, is slidably mounted in the bracket 80, and its rear end is connected to a rocker-arm 88, carried by a rock-shaft 89, adapted to suitable bearings in a standard 90 on the tender. The rock-shaft also carries a rocker-arm 91, that is connected by a rod 92 to an operating-lever



93 at the front end of the tender, and by pulling on this lever the pin 85 may be removed from the slot, allowing the arm 43 to fall by gravity and assume the inoperative position.

5 In the operation of the device the arm 43 is normally held in elevated position by means of a pin 85, and on approaching a coaling-station this arm may first engage with the lever 67, tripping the same and releasing the chock 10 from the car-wheels. The car will then descend the inclined plane 12 by gravity and acquire sufficient momentum to approximately equal the speed of travel of the train by the time the latter catches up with it. The arm 15 43 will then strike one or other of the fingers 39 and will be guided to a central position within the recess 37, striking the frame 32, and thus moving the release-bar 26 until the lugs 24 of the latter have been disengaged 20 from the fingers 23. The weight of coal in the bucket then moves the members thereof to dumping position and the coal falls upon the chute 50, the latter dropping down into the coal-box of the tender, which at this time 25 is immediately beneath it. As soon as the coal moves by gravity from the chute the latter is restored to its initial position by the counterweight 59. By this time the dumping-car has arrived at the foot of the ascending 30 incline 13 and the arm 43 forces the car along and gives it a sufficient impetus to carry the car up the incline or, if desired, the fireman may operate the lever 93 and move pin 85 to release position, allowing the arm 43 to 35 fall and become disengaged from the car. Should the engineer desire to pass without taking coal, the lever 93 is pulled and arm 43 drops to a position below the level of the lever 67.

40 In order to avoid accidental displacement of the car, auxiliary guard-rails 96 are arranged above the tracks 11, these rails serving to prevent the car from jumping the track.

With an apparatus of this kind it is possible to supply coal or other material to moving 45 trains without the necessity of stopping the train or slackening speed, and while the device is intended principally for the delivery of coal to the tender of a locomotive it might 50 also be used for the purpose of delivering freight or goods of any character to moving cars.

Having thus described the invention, what is claimed is—

55 1. In apparatus for supplying coal to the tenders of moving railway-trains, an elevated support arranged above the railway-track, and provided with inclined rails, a dumping-car mounted on the rails, means for locking 60 the dumping-car from movement, and a train-carried member for releasing the car in advance of the arrival of the tender thereunder, permitting the car to descend the inclined rails by gravity, said member serving subse- 65 quently to engage and move the car, and

serving further to trip the dumping mechanism and permit the dumping of the load carried by the car.

2. In apparatus of the class described, an elevated structure having an inclined track, a 70 dumping-car arranged on said inclined track, a chock for holding the same from movement, a lever connected to said chock, and a train-carried member adapted to engage said lever in advance of the arrival of the tender under 75 the car, permitting the car to descend the inclined track and acquire momentum in advance of the dumping operation.

3. In apparatus of the class described, an elevated support, a dumping-car arranged to 80 travel thereon, a sectional bucket having locking-fingers arranged in close relation, a release-bar having lugs engaging said fingers, and an arm carried by the train and arranged to move said bar to release position. 85

4. In apparatus of the class described, the combination with an elevated support, of a car arranged to travel on the support, a sectional dumping-bucket carried by the car, locking-fingers carried by the bucket mem- 90 bers, a release-bar having lugs for engaging said fingers, and a train-carried arm for moving the bar to release position and for moving the car at a speed equal to that of the train.

5. In apparatus of the class described, the 95 combination with an elevated support, of a car arranged to travel on the support, a sectional dumping-bucket on the car, a trip mechanism for releasing the bucket, a slidable frame for operating said trip mechanism, a pair of fingers carried by the frame and 100 having cam-shaped inner ends, and a train-carried arm arranged to engage and be guided by said fingers.

6. In apparatus of the class described, the 105 combination with an elevated support, of a car arranged to travel thereon, a sectional bucket on the car, locking-fingers carried by the bucket members, a release-bar engaging said fingers, a slidable frame connected to the 110 release-bar, a train-carried arm for engaging such frame and forcing the release-bar to disengaged position, and a pair of guiding-fingers pivoted to the frame and having cam-shaped free ends for guiding said arm to 115 proper position.

7. In apparatus of the class described, the combination with an elevated frame, of a car arranged to travel on the frame, a sectional 120 dumping-bucket on the car, a pivotally-mounted counterweighted chute on the car at a point below the bucket, and movable to open position under the weight of the contents of said bucket, and a train-carried 125 means for releasing the bucket.

8. In apparatus of the class described, the combination with an elevated support, of a car, a sectional bucket carried by the car, a chute pivoted to the lower portion of the car 130 at a point under the bucket, a counterweight



for holding the chute in elevated position when empty, and a train-carried means for releasing the bucket and insuring movement of the car at a speed equal to that of the train.

9. In apparatus of the class described, the combination with an elevated support, of a dumping-car arranged to travel thereon, a pivotally-mounted arm carried by the train, a locking-pin for holding the arm in elevated position, and an operating-lever for releasing said pin and allowing the arm to drop to in-operative position.

10. In apparatus of the class described, the combination with an elevated structure, of a

dumping-car mounted thereon, means for locking said car from movement, and a signal connected to said locking means.

11. In apparatus of the class described, the combination with an elevated support, of a dumping-car mounted thereon, a signal, and means for automatically moving said signal in accordance with the position of the car.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES M. MILLER.

Witnesses:

J. H. JOCHUM, Jr.,

H. MILLER.

Correction in Letters Patent No. 811,425.

It is hereby certified that in Letters Patent No. 811,425, granted January 30, 1906, upon the application of Charles M. Miller, of Tyrone, Pennsylvania, for an improvement in "Coaling Devices for Moving Trains," an error appears in the printed specification requiring correction, as follows: Page 3, line 60, after the word "train," the comma should be stricken out; and that the said Letters Patent should be read with this correction therein, that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of August, A. D., 1910.

[SEAL.]

F. A. TENNANT,

*Acting Commissioner of Patents.*

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