

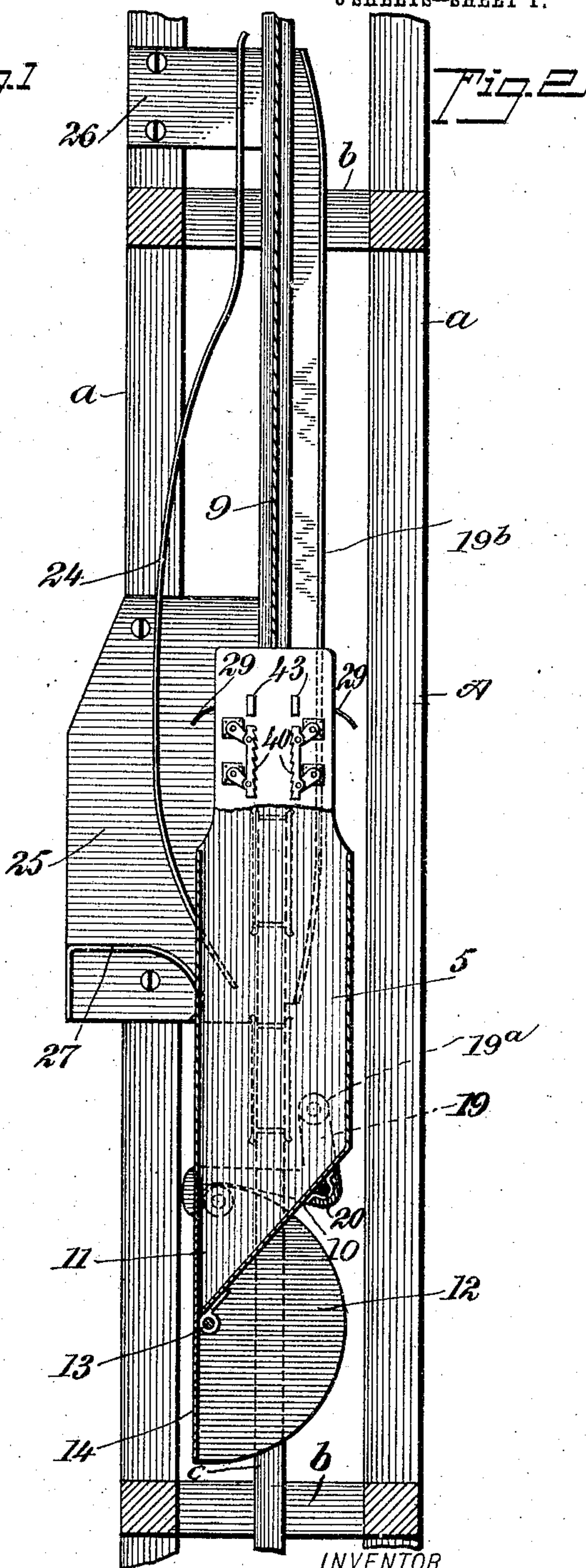
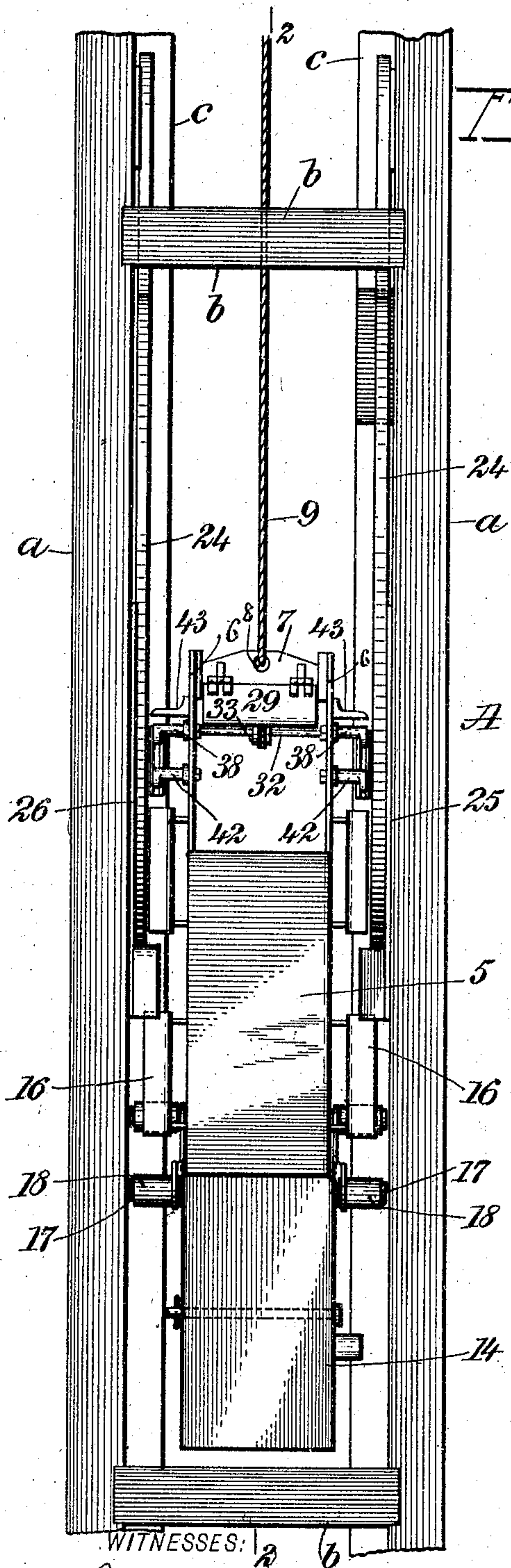
No. 781,450.

PATENTED JAN. 31, 1905.

D. B. McTAGGART.
AUTOMATIC DUMPING ORE ELEVATOR.

APPLICATION FILED JUNE 11, 1903.

3 SHEETS—SHEET 1.



WITNESSES:
J. J. Brophy
R. B. Caranagh

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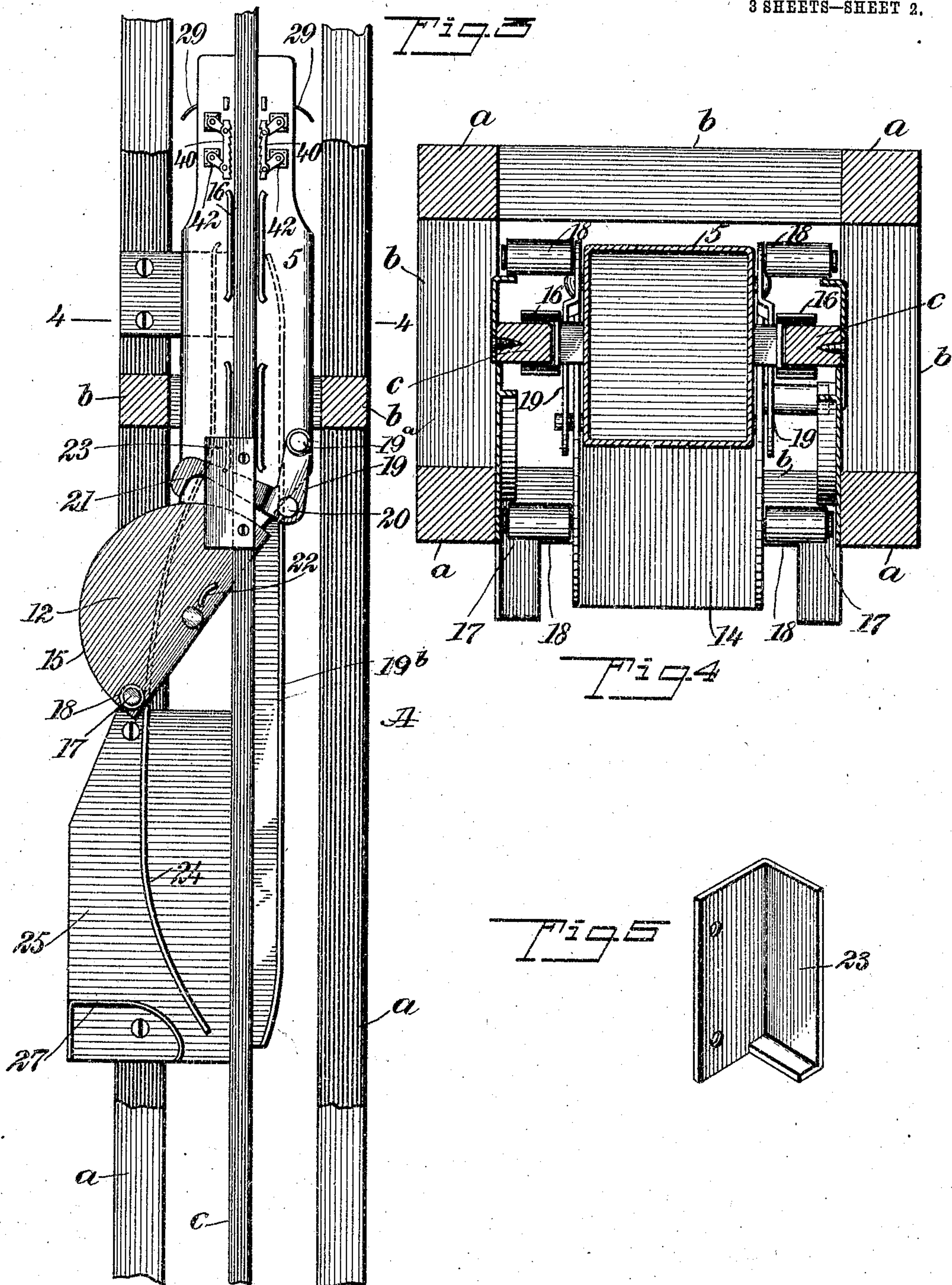
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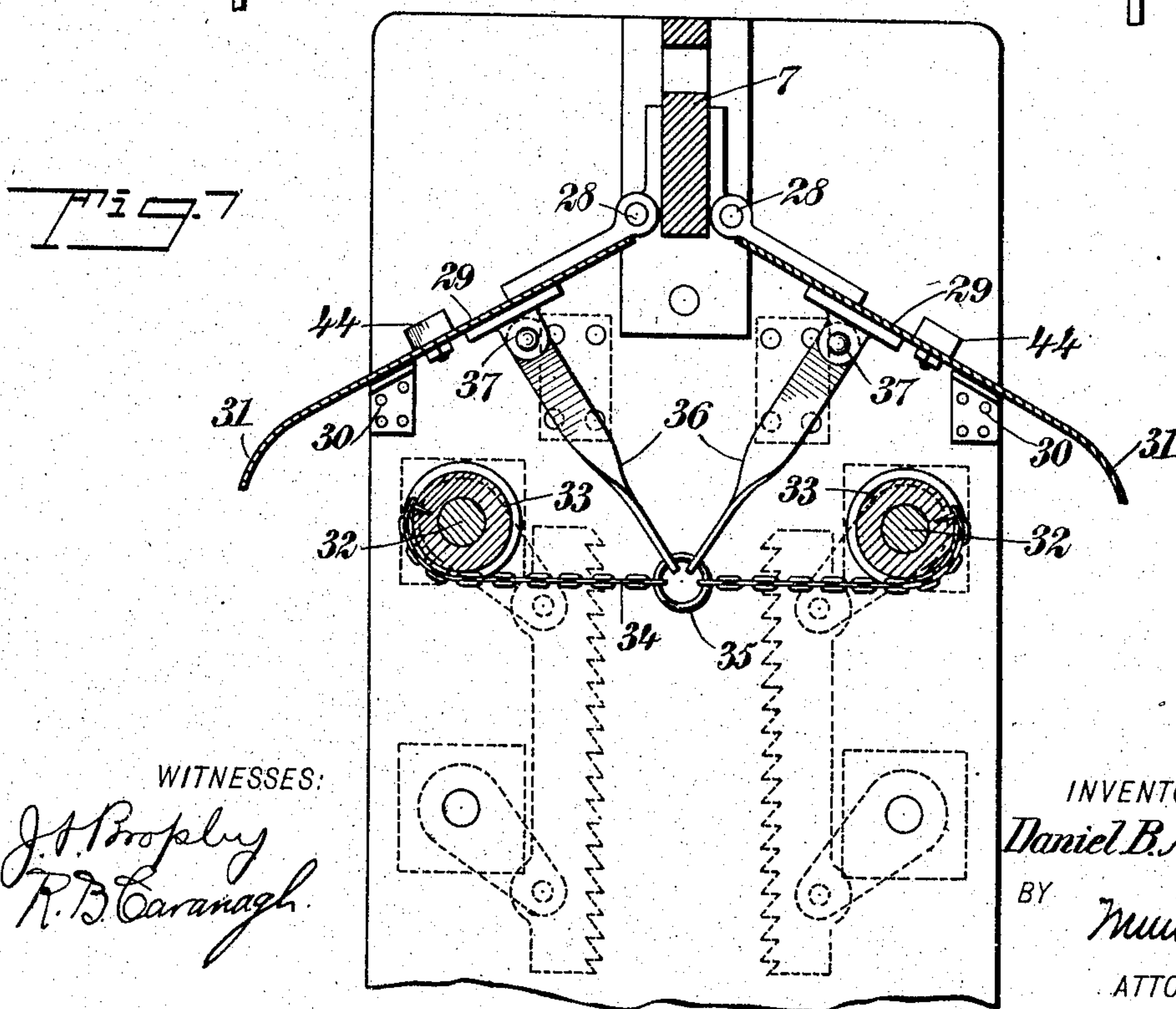
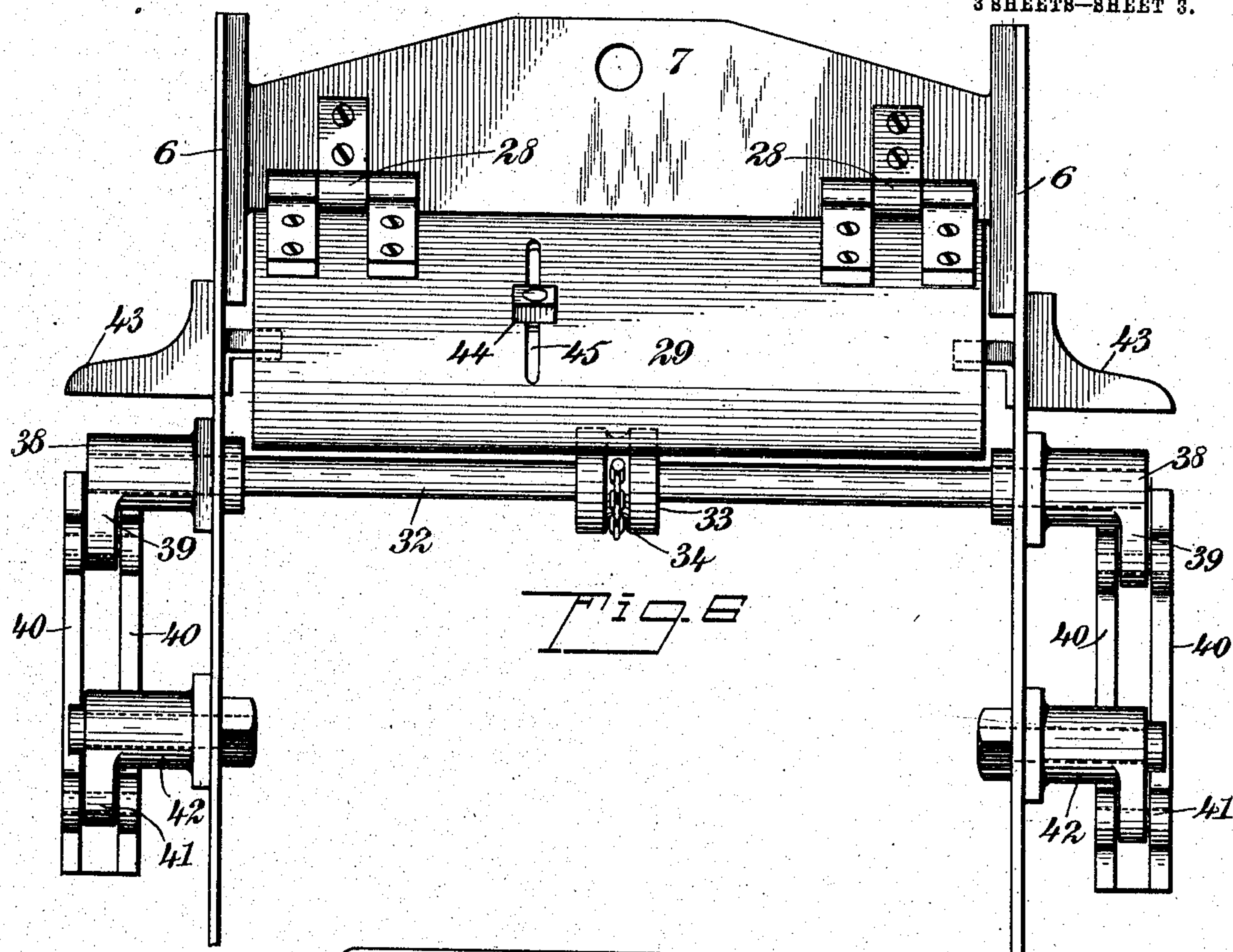
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WITNESSES:

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UNITED STATES PATENT OFFICE.

DANIEL B. McTAGGART, OF BUTTE, MONTANA, ASSIGNOR OF ONE-HALF
TO JOHN P. O'NEILL, OF BUTTE, MONTANA.

AUTOMATIC DUMPING ORE-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 781,450, dated January 31, 1905.

Application filed June 11, 1903. Serial No. 160,985.

To all whom it may concern:

Be it known that I, DANIEL B. McTAGGART, a citizen of the United States, and a resident of Butte, in the county of Silverbow and State of Montana, have invented new and useful Improvements in Automatic Dumping Ore-Elevators, of which the following is a full, clear, and exact description.

The present invention relates to ore-elevators, and has particular application to certain novel and useful improvements in devices of the class described known as "dumping-skips."

In carrying out the present invention I have particularly in view providing an automatic side-dumping elevator or skip for hoisting, lowering, and automatically discharging coal, ore, or other material in mines, which skip shall embody the essential features of simplicity, durability, and economy in installation.

There are certain disadvantages incident to the skip or ore elevators now in use, among them being that the car or skip proper has to be inverted or turned upside down to cause it to discharge its contents, and owing to the size and weight of the skip a relatively larger amount of head-room is required to dump the load, approximately thirty feet for the skips ordinarily in use.

It is a further object of my invention to prevent these difficulties by providing an automatic skip or dumping-car which will discharge its contents without the necessity of inverting the car, thus effecting a saving in the amount of head-room required to dump the load, thereby reducing the height of the head-work or gallows-frame and rendering it more rigid and less expensive to construct. By avoiding the inverting of the car or skip the latter will discharge its contents on every trip, while under the present system the fine ore often packs in the bottom until two and three tons have accumulated, when it is necessary to cease the hoisting and employ operators to remove the fine ore, thus causing delay and reducing the capacity or output of the mines.

A further object of my invention is to pro-

vide a safety-clutch mechanism for preventing the car being dashed to pieces at the bottom of the shaft in case the cable parts.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a view in front elevation of an automatic dumping skip or elevator embodying my improvements. Fig. 2 is a vertical sectional view of the same, taken on the line 2 2 of Fig. 1. Fig. 3 is a view in side elevation of my improved dumping-skip, a portion of the framework being removed. Fig. 4 is a transverse sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a detail perspective view of a stop or bracket employed for closing the apron portion of the car. Fig. 6 is a view in side elevation of a portion of the elevator having my safety mechanism applied thereto, and Fig. 7 is a transverse vertical sectional view of the same.

Referring now to the accompanying drawings in detail, A designates the framework of the shaft, said framework being of ordinary structure, comprising four vertically-arranged timbers *a a a a* and horizontally-connected cross-timbers *b b b b*, arranged at suitable intervals along the vertical timbers, these horizontal cross-pieces strengthening and bracing the main vertical timbers. Secured to the inner side of the cross-timbers *b b* and approximately equal in length to the main vertical timbers *a* are the parallel car-guiding standards *c c*, such standards being designed to guide the car in its movement up and down the shaft.

The main body portion of the car or skip is a box-like structure, (indicated by the numeral 5,) said car having upwardly-extending arm portions 6 6, connected by the cross-head 7, and to the cross-head is adapted to be connected by passing through an aperture 8 or otherwise the hoisting-rope 9. The lower portion of the car is formed with a downwardly inclined or slanting bottom 10, an opening in the side of the car being formed between this inclined bottom portion and one of the sides of the car, said opening or mouth portion being designated by the numeral 11.

In order to close the opening when the car is loaded and being elevated, I have provided an apron 12, connected by a hinge, as at 13, to the extreme end of the bottom portion of the car, said apron being formed with a vertical or straight wall 14 and a curved or approximately semicircular wall 15, joining the vertical wall at right angles thereto. It will be observed that this semicircular apron arranged as it is at the lower edge of the sloping bottom is designed to close the mouth or opening of the skip when the latter is loaded and acts as a chute to prevent the load from being spilled down the shaft when the skip is dumped. In order to cause the car or skip to slide freely up and down the guide-standards *c c*, I have secured to the sides thereof a number of guiding-lugs 16.

The following mechanism is employed for causing the dumping or unloading of the skip: Attached to the sides of the apron are the laterally-extending studs or projections 17 17, having rollers or trunnion-wheels 18 18 mounted thereon. A bell-crank 19 is pivoted, as at 20, to the box portion of the car, near the bottom thereof, the end 21 of the free arm of said crank being formed with a hook which is adapted to engage with the projections carrying the rollers and lock the apron in position to close the mouth of the skip when the latter is loaded. There are two of these bell-cranks 19 in the present instance, one on each side of the skip or car adjacent to the guide-ways. Attached to the sides of the apron are curved plates, such as shown at 22, (see Fig. 3,) adapted when the car has been moved to proper height for dumping to contact with trip-plates 23, secured to the guide-standards *c c*, the contact or engagement between the plates on the sides of the apron and the trips on the vertical standards causing the apron or movable bottom to swing upward and close, thereby preventing damage resulting to the car by obviating the possibility of the apron in its open position contacting with the timbers at the top of the shaft. Secured to the vertical guide-standards are the curved strips or bars 24 24, adapted when the loaded car is moving upward in the frame and the elbow or bell-crank lever latches have been disengaged or released from the rollers 18 to contact with or actuate said wheels or rollers 18 on the semicircular apron, thereby causing said apron to be moved upon its pivots to approximately the position shown in Fig. 3—that is to say, so the mouth of the car will be open and the apron brought in position to act as a chute or discharge for the material leaving the car. It will be noted that each latch 19 is provided at its elbow portion with a roller 19^a, designed when the skip or car is moved vertically to contact with the long bearing-flanges 19^b, thereby lifting the hooked end of the latch from the roller 18 and permitting the bottom or apron to open as described. The guide-

strips 24 24 instead of being secured directly to the framework of the shaft may be formed with plates 25 26, fastened in any desired manner to the timber of the shaft. At the lower end of the plate 25 and separated slightly from the end portion of the strip 24 is an extension or angle-iron 27, adapted when the car is descending into the shaft after having discharged a load to contact with the trunnion-rollers 18 of the apron and force the latter into its closed position over the mouth or discharge end of the car.

The operation of the elevator up to this point will be readily apparent from the above description. With the apron covering the mouth or opening of the car or skip the latter is loaded with ore and the car is hoisted or lifted in the shaft. When the desired level has been reached and the car is to be dumped, the trunnion-rollers 18 strike the tripping-strips 24 and running on the outside thereof cause the apron to be tilted and automatically release the locking-hook 21, the apron assuming approximately the position shown in Fig. 3, in which position the ore or material passing through the opening in the car will be directed outside the shaft to the proper place. When the rollers 18 strike the inner curved end of the lug or plate 27, the apron will be forced into its closed position and the latch-hook dropping through gravity will engage with the projections of the apron, locking the latter in its normally closed position.

The above description has related mainly to the construction of the skip or car proper, and I will now proceed to describe the mechanism employed for checking the accidental descent of the car should the cable break, this mechanism preventing the car being dashed to pieces at the bottom of the shaft.

Secured to the side of the cross head or bar 7 of the car through the medium of hinges 28 28 are two outwardly-extending blades or wings 29 29, designed to be held in a normally outwardly and downwardly inclined position through the medium of stop-blocks 30, upon which said wings rest, the lower free end portions of the wings being curved, as shown at 31 31. Extending through the opposite sides of the car-frame below the wings and parallel thereto are the shafts 32 32, each shaft having arranged approximately centrally thereof a chain barrel or wheel 33, around which extends a chain 34, these chains being connected at their free ends through the medium of a ring 35, supported from straps 36 36, which are in turn secured to the under side of the wings 29 29 through the medium of joints 37 37. At the portions of the shafts extending beyond the outside faces of the car-body are secured short sleeves or tubular sections 38 38, each of which is provided with a lug 39, to which lug are pivotally secured the serrated or toothed jaw members 40 40, there being two of these toothed members for each sleeve,

and such members at their lower end portions are pivotally connected, as at 41, to short sleeve-sections 42 42, similar to the sleeves 38 38. Stopping-blocks 43 43 are secured to the outside of the car above the sleeves 38 38 for the purpose of preventing the sleeves turning too far when the shaft is rotated, which would tend to throw the jaws out of operation.

The operation of the safety device will be immediately evident to those familiar with mechanisms of this character. When the skip parts from the cable, the air-pressure acting on the under side of the wings 29 will cause the latter to rise, thereby throwing the toothed jaws or dogs 40 into contact with the wooden guide, and the weight of the skip or car bearing on the shafts 32 will firmly embed the toothed jaws in the wooden guide, which will check the descent of the car and prevent injury to the same. This device has many advantages over the safety-clutch in general use on ordinary skips and cables, inasmuch as it does not depend on springs or similar devices to throw the clutching-jaws into operation, the wings being so arranged that they can be set to operate after the given velocity has been exceeded, this being possible through the medium of a weight 44, adjustable in a slot 45 formed in each wing.

With an elevator such as described the material may be rapidly and easily removed from the mine. In the old system, such as described, where it is necessary to turn the skip upside down such inversion must take place very slowly to prevent damage, while with my improved non-inverting car no damage can result from rapid dumping.

Another advantage incident to my improvement over the ordinary style of skip is that miners and station-tenders may ride on these skips from level to level or to the surface without danger, as the skip remains in the same position in the shaft at all times, while in the ordinary inverting-skip the operators were often seriously injured or killed by neglecting to leave the skip at the level below the place where the skip dumps or by the engineer forgetting to stop at said level.

There are many advantages incident to my improved automatic dumping-elevator, but as they will be apparent to those familiar with devices of this character it is unnecessary to dwell upon the same.

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

1. The combination of a frame, a car movable therein, said car having an opening in the side thereof, an apron pivoted to said car for closing said opening, projections mounted on the side of the apron, and a latching device pivoted to the car and designed to engage with the projections for locking the apron against movement.

2. The combination of a frame, a car mov-

able therein, said car having an opening near the bottom portion thereof, an apron pivoted to said car and adapted to close said opening when the car is loaded, said apron acting as a discharge-chute for the material passing from the car, when the apron is moved upon its pivot to permit such discharge, an elbow-lever pivoted to said car and designed to engage with the projection formed on the apron for locking the latter, and a relatively long bearing-strip for automatically tripping the locking-lever to cause its disengagement from the projection, substantially as set forth.

3. The combination of a frame, a car movable therein, said car having a discharge-opening, an apron pivoted to the car adjacent to said opening for closing the latter, said apron having a flat bottom portion and semicircular side portions, and means for locking the apron against movement, substantially as set forth.

4. The combination of a frame, a car movable therein, said car having a discharge-opening, an apron adapted to close said opening when the car is loaded, said apron acting as a discharge-chute when the material is being discharged, means for locking said apron in its closed position, such means including rollers mounted upon the apron, and an elbow locking-lever secured to the car and designed to engage with said rollers, means for releasing the latching-lever, and means for actuating the apron to cause the latter to assume its open discharging position.

5. The combination of a frame, a car movable therein, said car having a discharge-opening, an apron adapted to close said opening when the car is loaded, said apron acting as a directing-chute when material is being discharged, a latching device for locking the apron in its closed position, means including a relatively long bearing-strip for releasing the latching-lever, and means for permitting the apron to assume its position as discharge-chute, said latter means including a curved strip designed to contact with projections carried by the apron.

6. The combination of a frame, a car movable therein, and having a discharge-opening, an apron pivoted to said car and adapted to close said opening, means for releasing the apron from its locked position, and means including a curved strip secured to the standards of the frame adapted to actuate the apron to cause the latter to assume an open position, substantially as set forth.

7. The combination of a frame, a car movable therein, said car having an inclined bottom portion, a discharge-opening adjacent to said inclined portion, means pivoted to said car for closing said car when the car is conveying material, said means being designed to act as a discharge-chute when the material is being discharged from the car, an elbow latching-lever pivoted to the car and adapted

to engage with the closing means for retaining the latter in a closed position, a tripping-strip for releasing the latching-lever, and means for forcing the apron into an open position, substantially as set forth.

8. The combination of a frame, a car movable therein, said car having an inclined bottom portion and a discharge portion in one side adjacent to the bottom portion, an apron pivoted adjacent to the inclined bottom portion for closing said opening and for assisting in the discharge of material, and means including an elbow-lever pivoted to the car and rollers secured to the apron for locking the apron in its closed position.

9. The combination of a frame, a car movable therein, said car having a discharge opening, an apron pivoted to said car adjacent to said opening, and adapted to close the same, projections carrying rollers, secured to said apron, and a latch pivoted to the car and adapted to engage with the projections for locking the apron in its closed position when the car is loaded, substantially as set forth.

10. The combination of a frame, a car movable therein, said car having a discharge-opening, means pivoted to said car for closing the opening, means for automatically actuating the closing means to permit the discharge of material through the opening, said automatically-actuated means including a curved tripping-strip, and means for returning the closing means to its normal closed position, said latter means comprising a bracket secured to the side of the shaft, and a lug secured to the closing means, said lug being adapted in the

movement of the car, to contact with the bracket, substantially as set forth.

11. The combination of a frame, a car movable therein, said car having a discharge-opening, an apron pivoted to the car adjacent to said opening for closing the latter, trunnion-wheels carried by said apron, curved tripping-strips mounted on the shaft and adapted to contact with the trunnion-wheels of the apron to actuate the latter for permitting the discharge of material through the opening in the car, and means for automatically closing the apron after the material has been discharged therefrom.

12. The combination of a frame, a car movable therein, said car having a discharge-opening, an apron having a flat-face portion and semicircular side portions pivoted to the car adjacent to the said opening and designed to close the same, trunnion rollers or wheels carried by said apron, tripping-strips mounted on the shaft and designed to contact with the wheels of the apron to actuate the latter for permitting the discharge of material to the opening of the car, and a plate secured adjacent to said strips and adapted to return the apron to its normally closed position when the car is descending after discharging.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL B. McTAGGART.

Witnesses:

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C. M. PARR.