

No. 756,265.

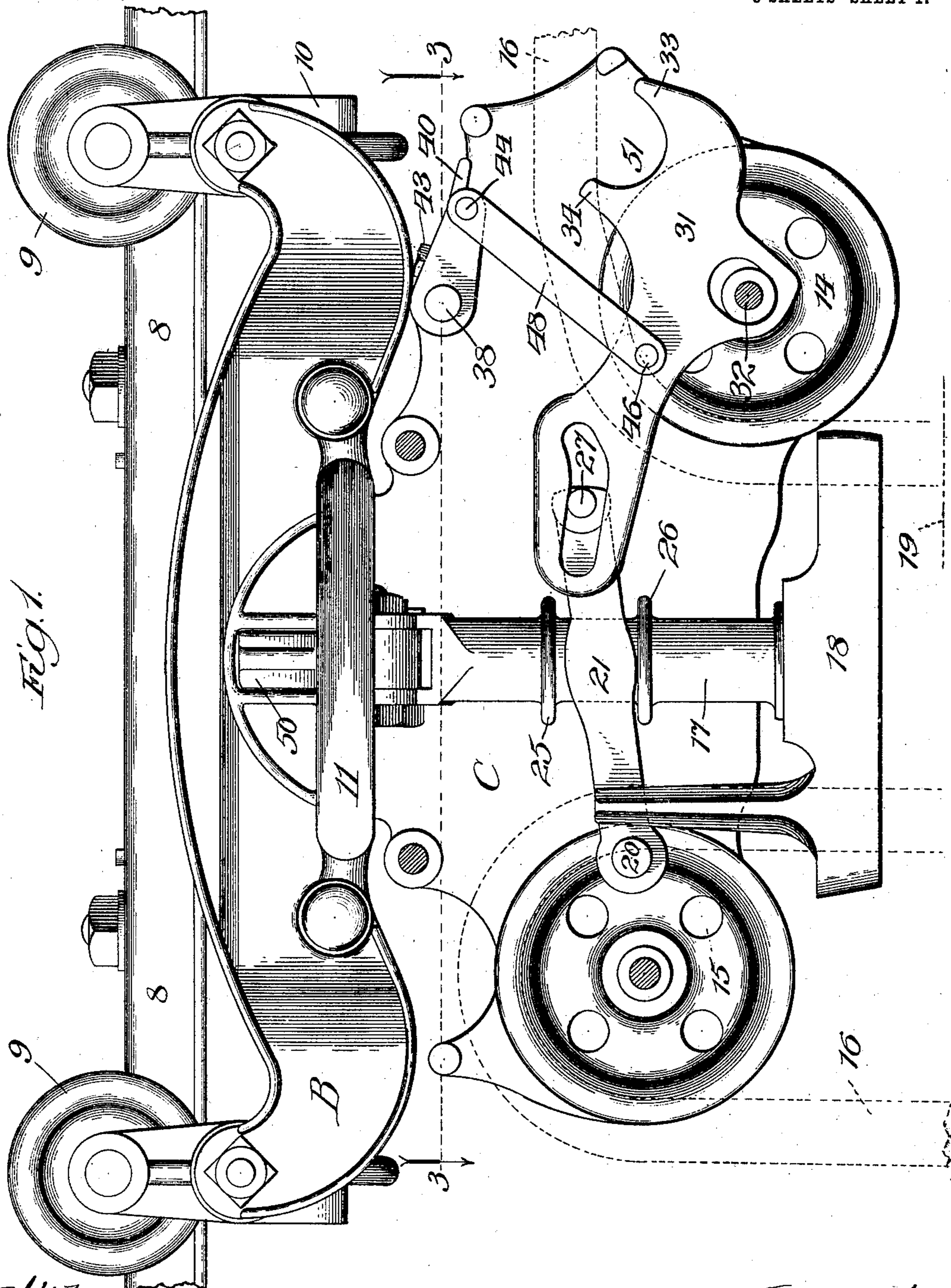
PATENTED APR. 5, 1904.

D. M. MOTHERWELL.
AUTOMATIC CLUTCH FOR CARRIERS.

APPLICATION FILED DEC. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
E. S. Chayford,
Geo. C. Brown

Inventor,
David M. Motherwell
By Robert Catherwood
Att'y

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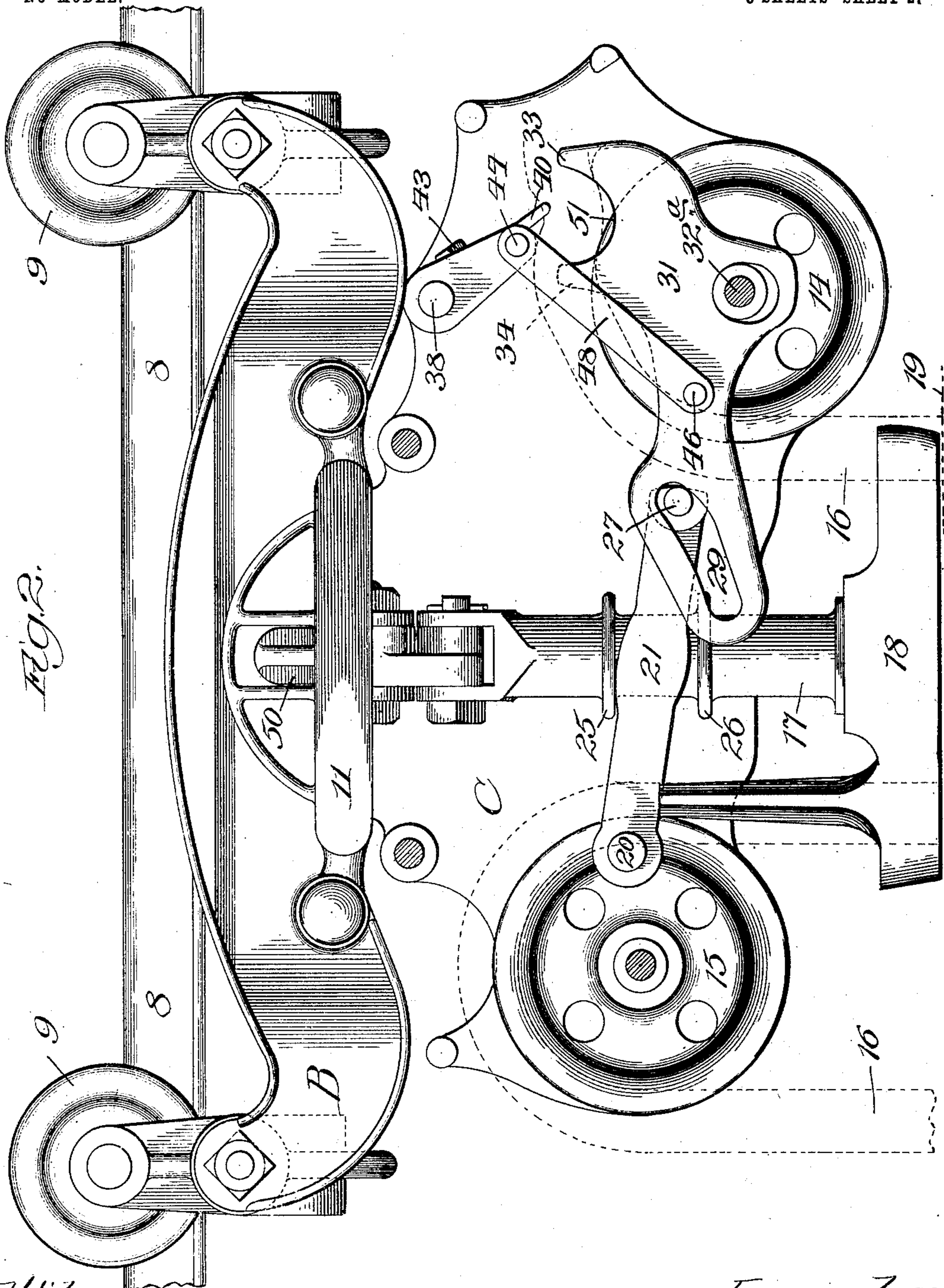
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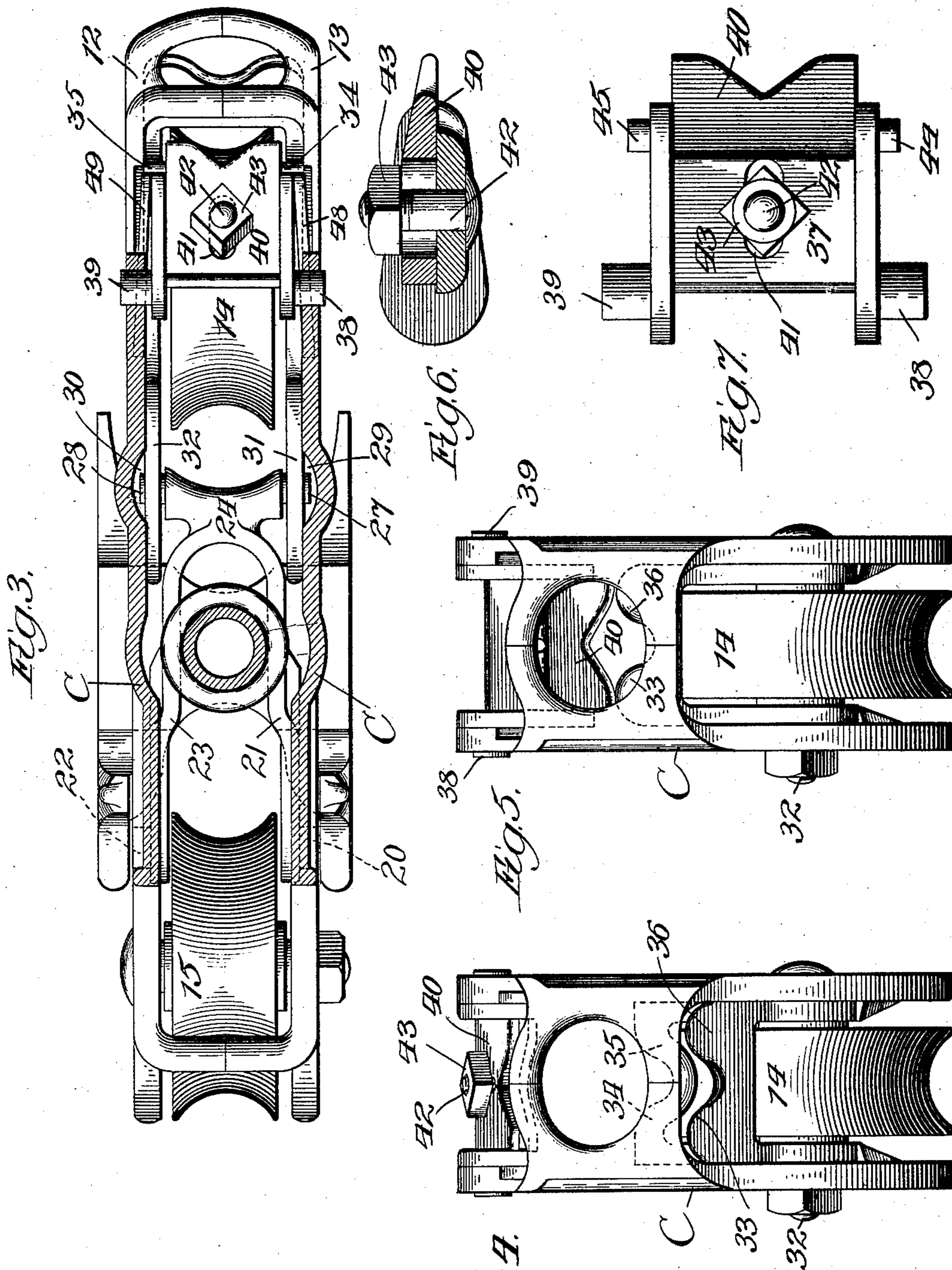
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3 SHEETS—SHEET 3.



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Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CLUTCH FOR CARRIERS.

SPECIFICATION forming part of Letters Patent No. 756,265, dated April 5, 1904.

Application filed December 14, 1903. Serial No. 185,168. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. MOTHERWELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Clutches for Carriers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in clutches for carriers, such carriers usually comprising a trolley adapted to travel on a track, an elevator device suspended from the trolley and having a rope or its equivalent, the rope being utilized both to lift the load and to move the trolley along the track.

More particularly my invention is adapted for use in carriers in which means are provided for locking the ropes to the trolley at any desired point, so that the load need not be lifted any farther than is necessary to clear obstructions in its path during transit along the track. A carrier of the type referred to is shown in my application, Serial No. 163,448, filed June 27, 1903.

The main object of my invention is to provide a simple, cheap, and effective clutch or gripping device which shall be operated by the hoisting or draft rope itself and wherein the gripping action shall be proportional to the weight of the load elevated. In this way the rope will be gripped lightly with a light load and strongly with a heavy load and the wear and strain upon the rope, trolley-track, and gripping device will be only such as necessary.

To this end the invention consists of a certain novel construction of the gripping-jaws arranged in proper relation to the hoisting-rope and certain novel features of construction, which are hereinafter described, and illustrated in the accompanying drawings.

In the drawings, in which like letters and numerals denote like parts throughout the several figures, Figure 1 is a side view of a carrier provided with a clutch embodying my invention, in which the rope and the clamp-stop are shown in dotted lines, the forward half of the exterior frame of the trolley being

removed to reveal the interior construction. The figure illustrates the positions assumed by the several parts when the carrier is stationary and the draft-rope is free to slip or to be drawn over the pulley to raise or lower the load. Fig. 2 is a similar view of the same, showing the position assumed by the parts when the clamp-stop attached to the hoisting-rope striking the vertical plunger of the carrier has caused it to operate the clutch or gripping jaws to grasp the draft-rope and to permit the carrier to be freely drawn along the track. Fig. 3 is a view taken on line 3 3 of Fig. 1 looking in the direction of the arrows, showing more particularly the peculiar construction of the upper and lower gripping-jaws. Fig. 4 is an end elevation of the draft-pulley and attached parts, showing the jaws drawn apart. Fig. 5 is a similar view of the same parts, showing the jaws drawn together. Fig. 6 is a view, partly in section and partly in elevation, of the upper gripping-jaw. Fig. 7 is a bottom plan view of the upper gripping-jaw.

In the drawings I have shown my automatic clutch in use on a traveling carrier of the type more particularly described and shown in an application for Letters Patent filed by me June 27, 1903, and numbered 163,448, though it is obvious to one skilled in the art that the device may be readily adapted to other carriers and that the modifications necessary for such adaptation will readily suggest themselves. In the particular carrier shown in the accompanying drawings, 8 denotes any suitable track upon which the wheels of the trolley travel. Secured to the wheels are the depending yokes 10, to which the truck-frame B is suitably secured, and swiveled to this frame in the circular guideway 11 is the trolley C. In the carrier shown two similar frames 12 and 13 form a shell to support the pulleys and protect and support the plunger and gripping device. The trolley has secured to it one or more pulleys adapted for the reception of draft or hoisting ropes. In the drawings are shown two pulleys 14 and 15 and the rope 16. Through the center of the trolley or shell extends the vertical plun-

ger 17, pivoted in such manner at its upper end that it can rise and fall and having on the upper portion suitable pivoted detents 50 for clutching the track and arresting the progress of the carrier when the plunger falls. The plunger has a contacting plate 18 attached to its bottom in alinement with the clamp-stop 19. The clamp-stop rising with the rope is thus adapted to strike and lift the plunger a distance sufficient to operate the clutch-levers hereinafter described.

Pivotally secured to the frame 13 on its inner side at the point 20 is the operating-lever 21, and on the frame 12 at the point 22 is the operating-lever 23, both similar in construction. These levers are connected at their forward ends by the cross-piece 24, (which in Fig. 3 is shown cut away to permit free passage of the rope 16.) I prefer to cast these levers and cross-pieces in one single casting. The levers embrace the plunger 17 and are lifted or lowered by it by means of the collar or flange 25 on the plunger 17 above them and the collar or flange 26 below. Thus when the plunger 17 is elevated the collar 25 pushes up the levers 21 and 23, and when the plunger drops the collar 25 pushes them down. The forward end (and by the term "forward" I refer to the right-hand end as seen in the position occupied in Figs. 1 and 2) of the levers 21 and 23 is provided with side pins 27 and 28. These pins project into the slots 29 and 30, cut into the clutch-levers 31 and 32. Clutch-levers 31 and 32 are preferably constructed of a single casting, having on their ends the slots 29 and 30, and they are pivotally mounted about the axis 32^a of the pulley 14, on either end thereof. Both are similar in construction and are placed on opposite sides of the carrier. Plunger-slots 29 and 30 are curved, as shown, to facilitate the operation of the jaw-levers. The forward ends of the clutch-levers have a U-shape depression or open space 51. The protuberances 33 and 34, between which this U-shaped depression 51 lies, are connected by cross-pieces. Cross-piece 35 connects the protuberance 34 on lever 31 to the corresponding protuberance on lever 32, while cross-piece 36 connects the protuberance 33 on lever 31 and the corresponding protuberance on lever 32. It will be seen by inspection of Figs. 4 and 5 that the cross-pieces 35 and 36 are constructed to present to the rope 16, which slides over them, a curved concave surface and that the open space or depression 51 intervenes between them. The levers 31 and 32 have their fulcrums about the axis 32^a of the pulley 14.

Mounted on the interior of the frame C of the trolley, above the cross-pieces 35 and 36, and consequently above the path of travel of the rope 16, is the swinging plate 37. This plate is loosely pivoted to the frame at the points 38 and 39. Secured upon the lower end of the plate 37 is the crenulated edge piece or tooth 40, so placed that when the plate 37

is drawn forward toward the cross-pieces 35 and 36 this tooth will bend or curve the rope 16 into the U-shaped depression 51 and the concavities of the cross-pieces 35 and 36. In order to take up wear upon the parts of my clutch or gripping device and to adapt it to different-size ropes, I prefer to cut in the piece 40 the slot 41 and to fasten it and the plate 37 together by means of the bolt 42 with a movable head or nut 43. By loosening this nut 43 the piece 40 may be slipped along the length of the slot 41 and secured by again tightening up the nut. This upper plate 37 is operated by the plunger 17. I prefer to accomplish this result by placing upon the dependent end of the plate 37 the pins 44 and 45 and about midway between the rear end of the clutch-levers and their fulcrums on the axis of the pulley the pins 46. I then connect the pins 44 and 46 by means of the loose link 48 and the corresponding pins on the other side of the carrier by a similar link 49. By this construction turning the clutch-levers about their fulcrums simultaneously draws down the plate 37 and tooth 40.

The operation of my device upon a carrier is as follows: Starting with the position shown in Fig. 1, a load is attached to the draft-rope, the clamp-stop 19 adjusted about the rope at such a point that it will strike the plunger as soon as the load is hoisted off the floor far enough to clear intervening objects, and the free end of the rope pulled over the pulley. As soon as the clamp-stop strikes the contacting plate 18 of the plunger 17 the latter rises, pushing the annular collar 26 up against the levers 21 and 23, freeing the detents 50 and causing the levers 21 and 23 to raise the rear ends of levers 31 and 32 by means of pins 27 and 28, sliding in the slots 29 and 30. The carrier then starts to move along the track, and when the detents are clear of the stop-block the plunger 17 falls by gravity to the position shown in Fig. 2, drawing down levers 21, 23, 31, and 32 and through the latter the links 48 and 49 and plate 37, causing the rope to be gripped by the concave cross-pieces and the concave tooth 40 until it is locked to the carrier about the pulley 14. The heavier the load carried the firmer will be the grip of the clutch, while correspondingly the lighter the load the less will be the locking force. In this manner only such force as is necessary to hold the rope will be exercised.

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

1. In an automatic clutch for traveling carriers, in combination with a carrier, a hoisting-pulley and draft-rope passing thereover, a pair of levers each pivoted intermediate of the ends on opposite sides of said pulley to said carrier beneath the rope and having their forward ends connected by cross-pieces adapted to embrace the under side of a rope, a

swinging plate pivoted to the carrier above said cross-pieces having an edge adapted to embrace the upper side of the rope, link connections between the lower side of said plate and points on the operative ends of said levers and means for alternately operating said levers to lock and unlock said rope and carrier.

2. The combination in a traveling carrier having a hoisting-pulley and draft-rope passing thereover adapted to raise and lower loads, of a pair of levers having their forward ends connected by concave cross-pieces beneath said rope, each of said levers being pivoted intermediate of its ends to the carrier on opposite sides of said pulley, a swinging plate pivoted to the carrier above said cross-pieces and rope, and means for simultaneously lifting the forward ends of said levers and lowering the swinging plate to curve and lock said rope between said cross-pieces and plate, and means for tripping the lock to release said rope, for the purposes described.

3. In a carrier in combination with a hoisting-pulley and draft-rope adapted to run thereover, a pair of levers having U-shaped forward ends, the points or protuberances of said ends connected by two concave cross-pieces beneath said rope, said levers being pivoted intermediate of the ends to opposite sides of said carrier, a swinging plate pivoted to the carrier above said rope and lever ends, and provided with a concave bottom edge adapted to curve and lock said rope between said cross-pieces and bottom edge, a pair of links each loosely secured to the lower side of said plate and to a point on said levers intermediate of the fulcrum and operative end thereof, and means for alternately operating said levers to lock and unlock said rope and carrier, for the purposes described.

4. In a carrier having a hoisting-pulley and draft-rope adapted to run thereover, a pair of levers secured to said carrier supporting on their forward ends concave cross-pieces beneath said rope, a swinging plate secured to said carrier having a crenulated or concave tooth adapted to embrace said rope above said cross-pieces, means for operating said plate and levers simultaneously to clutch and lock said rope and carrier together between said tooth and cross-pieces and thereafter to unlock them, and means for adjusting said tooth in said plate to operate nearer or farther from said cross-pieces, for the purposes described.

5. In combination with a carrier adapted to travel along an overhead track and having a depending frame secured thereto, a pulley pivoted to said frame and a draft-rope passing thereover, a gripping device consisting of a pair of under jaws pivoted on either side of said pulley to the axis thereof beneath said rope and having concave forward ends, a pair of concave cross-pieces connecting the forward ends of said jaws, an upper jaw pivoted in said frame above the rope having a crenu-

lated lower end, a pair of links loosely secured to said jaw near its lower end on either side of said upper jaw near its lower end and to said lower jaws near their rear ends, means for alternately rocking the said lower jaws about the axis of said pulley as a fulcrum to curve and firmly hold said rope between said jaws during the progress of said carrier and to release said rope to permit it to pass freely over said pulley, for the purposes described.

6. In combination with a carrier adapted to travel on an overhead track and having a frame secured beneath it, a pulley journaled to the lower portion of said frame and having a draft-rope passed thereover, and means for securing loads to said draft-rope, a clamp-stop secured about said rope, a plunger in alinement with said clamp-stop, an operating-lever loosely secured in the middle by collars about said plunger having one end pivoted to said frame and the other slidably secured to the rear end of a pair of gripping-jaws pivoted about the axis of said pulley and having concave teeth adapted to rise beneath said rope, an upper jaw pivoted to the frame above said lower jaw, a link connecting the lower end of said upper jaw with the operating end of said lower jaw, means for drawing said rope over the pulley whereby said clamp-stop contacts with said plunger causing it to rise and operate said jaws to bend and firmly lock the rope, and means for dropping said plunger to trip said lock, for the purposes described.

7. In combination with a carrier adapted to travel along an elevated track, a pulley secured to said carrier, and a draft-rope passing thereover, a gripping device comprising a pair of levers pivoted on either side of said pulley to the axis thereof beneath the rope and having cross-pieces or lower jaws connecting their ends, an upper jaw pivoted to the carrier above the rope, links connecting said upper jaws and said levers, and means for tilting said levers whereby said upper and lower jaws are alternately locked and unlocked about said rope.

8. In combination with a traveling carrier, a pulley secured thereto, and a draft-rope passing thereover, a gripping device comprising a pair of levers secured to the carrier and fulcrumed about the axis of said pulley beneath said rope, said levers being connected at their forward ends by a cross-piece or lower gripping-jaw, an upper gripping-jaw secured to the carrier above the rope and adapted to swing toward said lower jaws, and means for alternately tilting said jaws together to grasp the rope and apart to free it, whereby said rope and carrier are alternately locked and unlocked for the purposes described.

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Witnesses:

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