H. W. BODENDIECK.

STREET CAR FENDER.

APPLICATION FILED MAY 7, 1910.

1,154,686.

Patented Sept. 28, 1915.

3 SHEETS—SHEET 1.

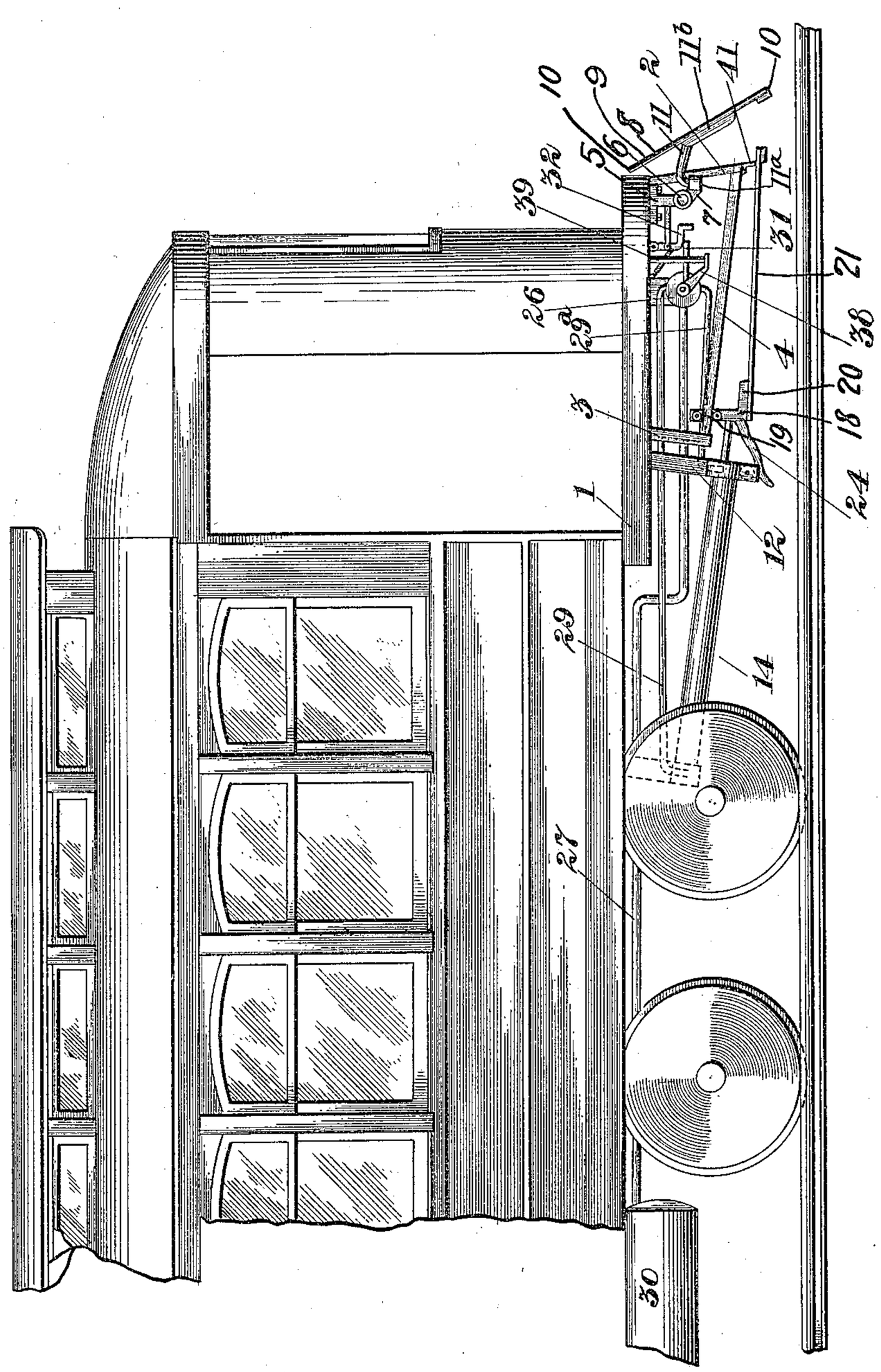

FIG. 1.

Witnesses

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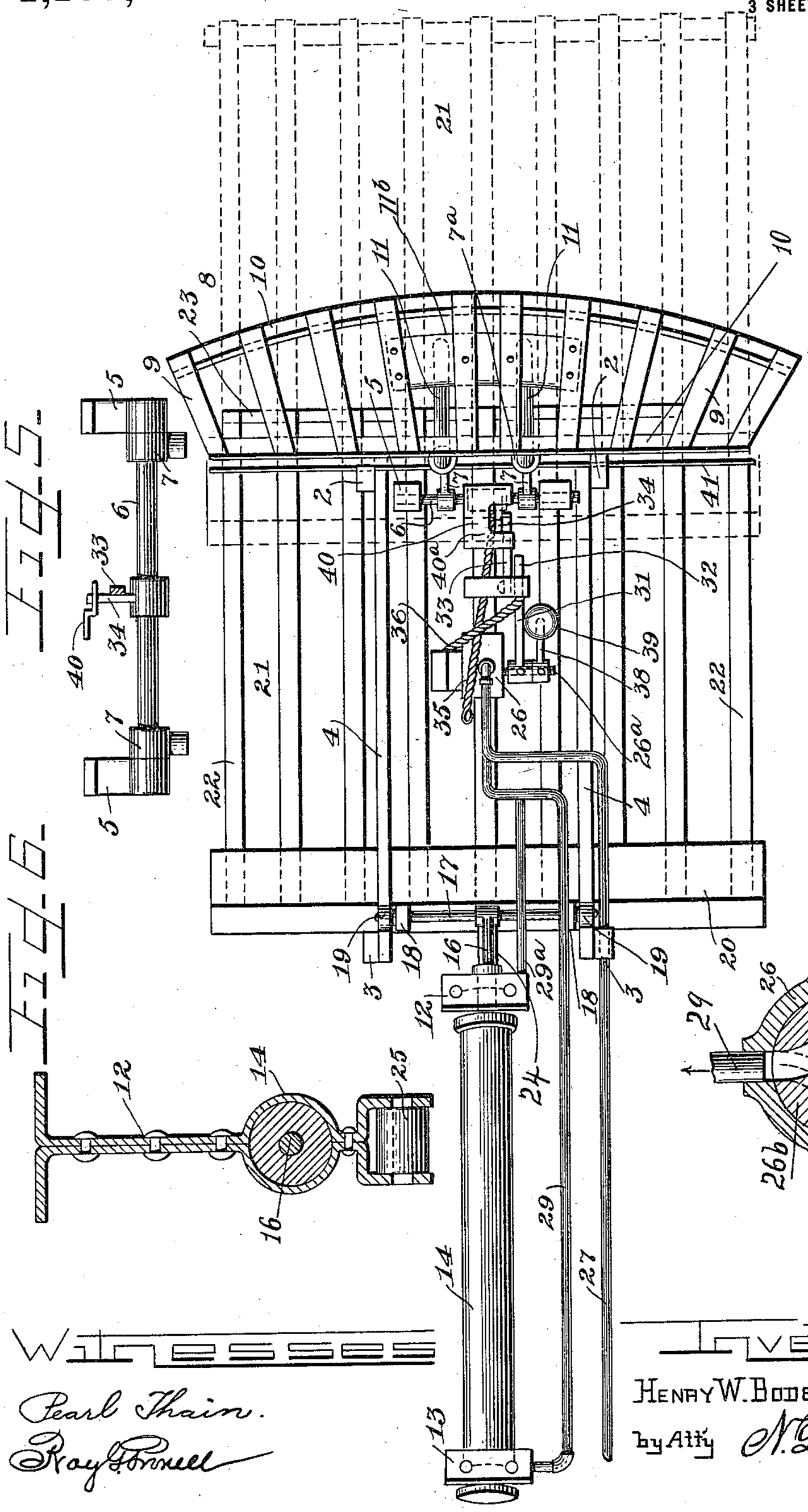

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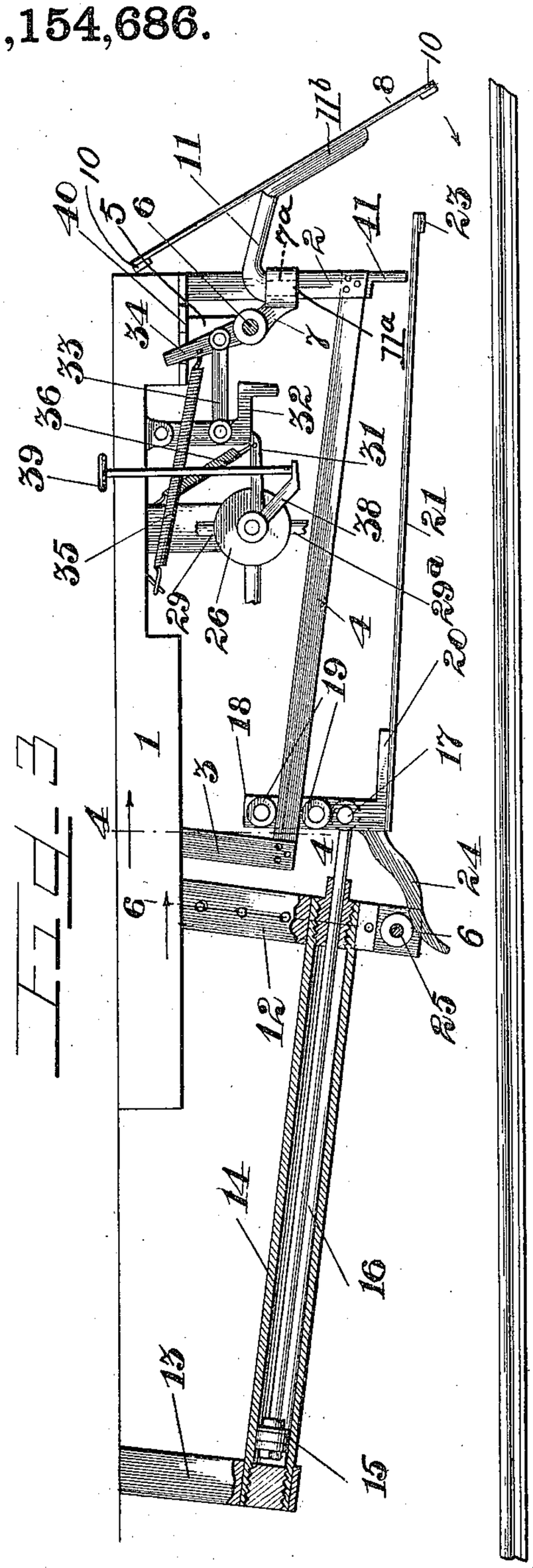

FIG. 3.

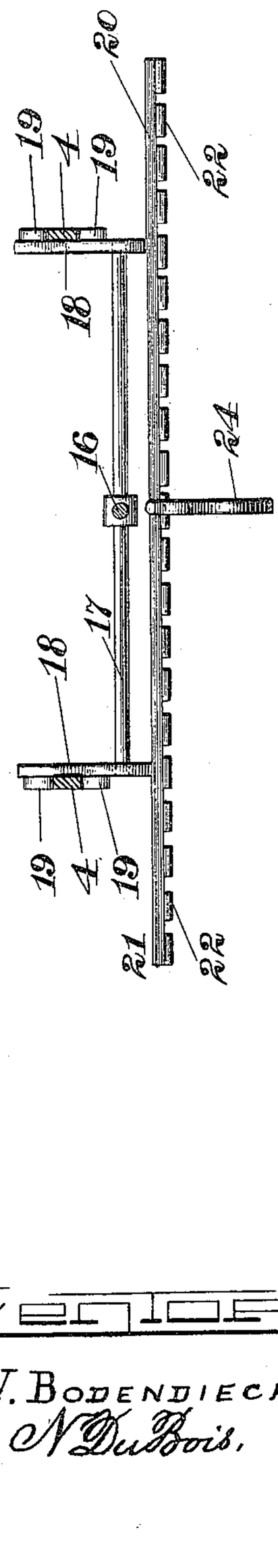

FIG. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

HENRY W. BODENDIECK, OF SPRINGFIELD, ILLINOIS.

STREET-CAR FENDER.

1,154,686. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed May 7, 1910. Serial No. 560,096.

To all whom it may concern:

Be it known that I, HENRY W. BODENDIECK, a citizen of the United States, and a resident of the city of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Street-Car Fenders, of which the following is a specification, reference being had to the annexed drawings.

This invention relates to automatic car fenders of the class set forth in U. S. Patent, #888,578, automatic car fender, granted to me May 26, 1908.

The main purpose of this invention is to provide a fender to pick up and carry persons or things on the track immediately in front of a moving car.

More particular purposes are to provide a power-actuated pick-up frame adapted to be projected forwardly of the car; to provide a yielding guard-frame operatively connected with the pick-up frame; and to provide means whereby the pick-up frame, after it has been projected, may be returned to its initial position, in readiness for the next operation without stopping the car.

Figure 1 is a side elevation of the car fender in position on the front end of a car. Fig. 2 is a top plan of the car fender. Fig. 3 is an enlarged combined elevation and sectional view, showing the main structure of the car fender in side elevation and the pneumatic cylinder in longitudinal section. Fig. 4 is a vertical section on the line 4, 4, of Fig. 3. Fig. 5 is an enlarged view of the shaft which supports the guard-frame. Fig. 6 is an enlarged transverse section on the line 6. 6. of Fig. 3 and Fig. 7 is an enlarged sectional view of the four-way valve.

Similar reference numerals designate like parts in the several views.

Downwardly extending front brackets 2 and shorter downwardly extending rear brackets 3 are secured on the under side of the frame 1 of the car platform. Parallel inclined guide rails 4 are rigidly connected with the brackets 2 and 3. Hangers 5 are rigidly secured on the under side of the frame 1. A shaft 6 is mounted to oscillate in suitable bearings on the hangers 5. Rigidly secured on each side of the center of the guard frame are inwardly directed guard supports 11, having integral fingers 11^a, and also having integral members 11^b, connected with the guard frame by any suitable means, not shown. Arms 7 extending downwardly and forwardly, are secured on the shaft 6 and have vertical sockets 7^a accommodating downwardly extending fingers 11^a at the inner ends of the guard-supports 11.

The guard frame, designated as a whole by the numeral 8, is mounted on the guard supports and the upper end of the guard frame is adjacent to the front end of the car platform. The guard frame comprises a suitable number of downwardly inclined slats 9 secured on upper and lower transverse bars 10 and spaced apart to prevent the passage of any large object between them.

Fixed hangers 12 and 13 support an inclined cylinder 14, centrally under the car. The front end of the cylinder 14 is somewhat lower than the rear ends of the guide rails 4 and the general inclination of the cylinder is parallel to the guide rails. The piston 15 connected with the rod 16, is adapted to slide in the cylinder 14, and the forward end of the piston rod 16 is pivotally connected with a transverse shaft 17. The ends of the shaft 17 are secured on the parallel veritcal arms 18. Journaled on the outerside of each arm 18 is a pair of rotative rollers 19, one above, and one below each guide rail 4, and the rollers guide the movement of the arms 18 on the guide rails 4 respectively. The lower ends of the arms 18 are connected by a horizontal transverse bar 20.

The pick-up frame, designated as a whole by the numeral 21, is secured on the underside of the bar 20. The pick-up frame comprises a number of parallel slats 22 (Fig. 4) connected at their front ends by a transverse bar 23. The width of the pick-up frame is somewhat greater than the gage of the track in order that when the pick-up frame is projected forwardly and depressed its front end will slide on the rails in advance of the car. A rearwardly extending downwardly curved arm 24 is secured on the bar 20. A revoluble roller 25 is supported near the lower end of the hanger 12. When the frame 21 is pushed rearward the curved part of the arm 24 slides under the roller 25, and the roller depresses the arm and causes the frame to occupy the substantially horizontal position shown in Fig. 3.

A four-way valve 26 suitably supported under the car platform has a stem 26[a], and a plug 26[b] (Fig. 7) secured on the stem.

A tank 30 (Fig. 1) containing compressed air is supported on the underside of the car.

A pipe 27 connects the valve 26 with the air tank 30, a pipe 29 (Fig. 2) connects the valve 26 with the rear or pressure end of the cylinder 14, and a pipe 29[a] connects the forward or exhaust end of the cylinder with the valve 26.

A forwardly projecting lever 31 is secured on the valve stem 26[a]. A detent 32 pivotally mounted on the under side of the platform 1 is situated above and extends over the front end of the lever 31 to normally keep the plug of the valve in position to maintain air pressure through the pipe 27, the valve 26 and the pipe 29[a] to act on the front end of the piston 15 to normally keep the pick-up frame in its retracted position. An inclined arm 34 is secured on the shaft 6 and a link 33 connects the arm with the detent 32.

The spring 35 has one end secured on the under side of the car platform and its other end connected with the arm 34, and the spring acts to normally keep the arm in the rearwardly inclined position shown in Fig. 3, and thereby keep the shaft 6 in such position that the guard-frame 8, mounted on the arms 7, will normally occupy the extended position shown in Fig. 3.

A spring 36 has one end connected with any suitable stationary support and the other end connected with the lever 31 and the spring acts to pull the lever upwardly. Upward movement of the lever 31 causes the plug 26[b] of the valve 26 to turn into position to permit air from the tank 30 to pass through the pipe 27 to and through the valve 26 and to pass through the pipe 29 to the interior of the rear part of the cylinder 14, and act on the rear end of the piston 15 to cause the piston to slide forwardly in the cylinder, and thereby cause the pick-up frame to be projected forwardly.

The lever 38 secured on the stem 26[a] of the valve 26 supports a vertically movable plunger 39 extending upwardly through the car platform.

After the pick-up frame has been projected forwardly the retracting of the pick-up frame may be accomplished by the operator pressing with his foot on the upper end of the rod 39 to depress the lever 38 to cause the application of air to the front end of the piston 15 within the cylinder 14, and thereby cause rearward movement of the piston to effect retraction of the pick-up frame.

The air in the cylinder 14 applied on the front end of the piston 15 acts to keep the pick-up frame in its retracted position and the piston rod 16 pulling on the arms 18 causes the rearwardly extending curved part of the arm 24 to bear against the roller 25 with the result that the rearward pull of the piston rod will cause the front end of the pick-up frame to tip upwardly so that the upper surfaces of the slats 22 will bear firmly against the lower edge of the stationary transverse bar 41 at the lower ends of the hangers 2 and thereby limit upward movement of the front end of the pick-up frame and prevent vibration of the pick-up frame by reason of the jolting or oscillation of the car.

A stationary horizontal plate 40 has a notch 40[a] accommodating the upper part of the lever 34, and the walls of the notch limit forward or rearward movement of the lever 34.

Under ordinary conditions the pick-up frame remains wholly retracted with its front end clear of the track rails.

The guard frame 8 normally occupies the forwardly extended position shown in Fig. 1.

The spring 35 is strong enough to normally keep the guard frame in its extended position, but if the lower part of the guard frame strikes a stationary or weighty object, the spring will stretch and permit rearward movement of the lower part of the guard frame, thereby causing forward movement of the upper end of the lever 34, and the lever 34 will pull on the link 33 to cause the detent 32 to swing forwardly and release the lever 31; whereupon the spring 36 will pull the lever 31 upwardly to rotate the plug 26[b] to open the valve 26 to cause the air in the front part of the cylinder 14 to exhaust through the pipe 29[a] and the valve 26 to the atmosphere and also to cause air from the tank 30 to flow through the pipe 27, the valve 26 and the pipe 29 into the rear part of the cylinder 14 and act on the piston 15 to cause the pick-up frame to slide forwardly. The first part of the forward movement of the pick-up frame will cause the curved arm 24 to withdraw from under the roller 25 and thereupon the forward end of the pick-up frame will fall upon the rails, and continued forward movement of the piston will cause the pick-up frame to slide forwardly on the rails and beyond the lower end of the guard fender, in position to pick up a person or object lying on the track, (as shown by dotted lines in Fig. 2). By reason of the downward inclination of the pick-up frame as it is projected forwardly it is impossible for it to rise over the person or obstruction on the track, but on the contrary it is forced under and picks up the person or thing as it slides along the rails, and carries same safely until the car can be stopped.

When the person or thing has been removed from the pick-up frame the operator will with his foot press the plunger 39 downward upon the lever 38 to cause partial rotation of the plug 26[b] to cause it to occupy the position shown in Fig. 7, and to cause the

lever 31 to move downwardly so that the forward end of the downwardly moving lever 31 will engage with the rear edge of the detent 32 to cause it to turn on its pivot sufficiently to permit the end of the lever 31 to pass the elbow of the detent, and thereupon the spring 35 acting on the arm 34, which is connected with the detent 32, will cause the lower part of the detent to move rearwardly and extend over the forward end of the lever 31, to hold the valve plug in the position shown in Fig. 7.

When the plug 26^b is in the position shown in Fig. 7 air from the rearward part of the cylinder 14 will exhaust through the pipe 29 and the valve 26 to the atmosphere and air from the tank 30 will flow through the pipe 27 to the valve 26 and from the valve through the pipe 29^a to the front end of the cylinder 14 and will act on the piston 15 to slide it rearwardly to cause complete retraction of the pick-up frame, and the pick-up frame will be held in its retracted position by the air pressure on the piston. This rearward movement of the pick-up frame will cause the arm 24 to engage on the roller 25 to elevate the forward end of the pick-up frame and hold it firmly against the transverse bar 41.

I have shown and described two guide rails 4 supporting the rear part of the pick-up frame and guiding its rearward movement, but it is obvious that one or more guide rails may be used without departure from my invention. It is obvious also that other details of construction may be varied without departure from the principles of the invention.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination of a car platform; an oscillative transverse shaft beneath the car platform; arms on said shaft having sockets; a guard-frame; arms on the guard-frame having fingers fitting in the sockets of the arms on said shaft; a lever on said shaft; a spring connected with said lever and effective to hold the guard-frame in its extended position; a valve provided with an oscillative plug and a valve stem; a lever on the stem of said valve; a detent connected with the lever on said oscillative shaft and engaging the lever on the valve stem; a spring connected with the lever on the valve stem and effective to cause partial rotation of the valve plug upon release of said detent; an air tank communicating with said valve; a pneumatic cylinder communicating with said valve; a piston adapted to slide in said cylinder; a pick-up frame connected with said piston; and means for partially rotating the valve stem to place the lever connected therewith in position to be engaged by said detent.

2. Fender structure comprising, in combination with a car body, a fender normally elevated, an air pressure system, normally restrained means for applying the pressure in said system to positively lower said fender, mechanism for releasing said means, and a device for diverting the air under pressure in said system and nullifying the effect thereof.

3. Fender structure comprising, in combination with a car body, a fender normally elevated, an air pressure system, normally restrained means for applying the pressure in said system to positively lower said fender, mechanism for releasing said means, a device for diverting the air under pressure in said system and nullifying the effect thereof, said means in normal position and said device in operative position being effective to segregate the actually effective air under pressure and exhaust the same.

4. In a car fender the combination of a pick-up frame; pneumatic means adapted to project and retract the pick-up frame; and one valve effective to control the supply of air to said pneumatic means to project the pick-up frame and likewise effective to control the supply of air to said pneumatic means to retract the pick-up frame.

5. The combination of an air reservoir; a pneumatic cylinder; a piston adapted to slide in said cylinder; means for supplying air from said reservoir to both ends of said cylinder; a pick-up frame directly connected with said piston; a single valve effective to control the compressed air going to both ends of said cylinder and controlling the exhaust of air from both ends of said cylinder and normally set to exhaust air from the rear end of said cylinder and admit compressed air into the forward part of said cylinder, to normally keep the pick-up frame in its retracted position; a yielding guard frame; connecting devices connecting the guard frame with said valve in such manner that pressure against the guard frame will operate the valve to exhaust air from the forward part of the cylinder and admit compressed air into the rear part of the cylinder to project the pick-up frame forwardly; and valve operating means effective to operate said valve to exhaust air from the rear end of the cylinder and admit compressed air to the front end of the cylinder to retract the pick-up frame and hold it in its retracted position.

6. The combination of a car; an air reservoir and a pneumatic cylinder connected with the car; a valve in communication with the air reservoir and with both ends of the pneumatic cylinder and adapted to supply compressed air in both ends of said pneumatic cylinder and exhaust air from both ends of said pneumatic cylinder and normally set to maintain compressed air in the

forward part of said pneumatic cylinder; a piston adapted to traverse said pneumatic cylinder; a pick-up frame connected with said piston and adapted to slide forwardly and rearwardly substantially in line with said pneumatic cylinder; a yieldingly supported guard frame; connecting devices connecting the guard frame with said valve to operate the valve upon the yielding of said guard frame to exhaust air from the forward part of said pneumatic cylinder and admit compressed air into the rear part of said pneumatic cylinder to project the pick-up frame forwardly; and a valve-operating device connected with said valve and adapted to operate the same valve to exhaust air from the rear part of the pneumatic cylinder and admit compressed air into the forward part of the pneumatic cylinder to retract the pick-up frame and hold it in its retracted position.

7. The combination of a car; a downwardly inclined pneumatic cylinder stationary on the car; a pick-up frame mounted to slide substantially in line with said cylinder; a roller adjacent to the front end of said cylinder; means for applying compressed air in and exhausting it from said cylinder to alternately project and retract the pick-up frame; a piston adapted to traverse said cylinder; a piston rod connected with said piston and pivotally connected with said pick-up frame; and a rearwardly extending and downwardly inclined finger connected with the pick-up frame and adapted to engage on said roller to raise the front end of the pick-up frame during the latter part of its rearward movement and support the pick-up frame in its retracted position.

8. The combination of a car; an air reservoir; a yielding guard frame; a pneumatic cylinder; a piston adapted to traverse said pneumatic cylinder; means for admitting air from the reservoir to and exhausting air from both ends of said pneumatic cylinder; a single valve adapted to receive air from said reservoir, and adapted to control the supply of compressed air at both ends of said pneumatic cylinder and also adapted to control the exhaust of air from both ends of said pneumatic cylinder; a pick-up frame directly connected with said piston; means for supporting the inner end of the pick-up frame when its outer end is on the track rails; means connecting the guard frame with said valve in such manner that movement of the guard frame will operate the valve to exhaust air from the front end of the pneumatic cylinder and apply air in the rear end of the pneumatic cylinder to project the pick-up frame forwardly; and valve-operating means effective to operate said valve to exhaust air at the rear end of said pneumatic cylinder and apply air at the front end of said pneumatic cylinder to retract the pick-up frame and hold it in its retracted position.

9. In a car fender, the combination of a pick-up frame; pneumatic means adapted to project and retract the pick-up frame; one valve effective to control the supply of air to said pneumatic means to project the pick-up frame and also effective to control the supply of air to said pneumatic means to retract the pick-up frame; and valve controlling means operative by contact with an opposing object in the line of travel of the car.

10. In a car fender, the combination of a pick-up frame; pneumatic means adapted to project and retract the pick-up frame; one valve effective to control the supply of air to said pneumatic means to project the pick-up frame and also effective to control the supply of air to said pneumatic means to retract the pick-up frame; valve controlling means operative by contact with an opposing object in the line of travel of the car to operate the valve to cause the projecting of the pick-up frame; and another valve controlling device effective to operate the same valve to cause retracting of the pick-up frame.

In witness whereof I have hereunto signed my name at Springfield, Illinois, this 15th day of Jan. 1910.

HENRY W. BODENDIECK.

Witnesses:

PEARL COLEMAN,

RAY G. TROXELL.