No. 860,622. PATENTED JULY 23, 1907.

A. R. BANNERMAN, W. SUMMERTON & D. MacDONALD.

PNEUMATIC TRUCK.

APPLICATION FILED MAY 2, 1906.

2 SHEETS—SHEET 1.

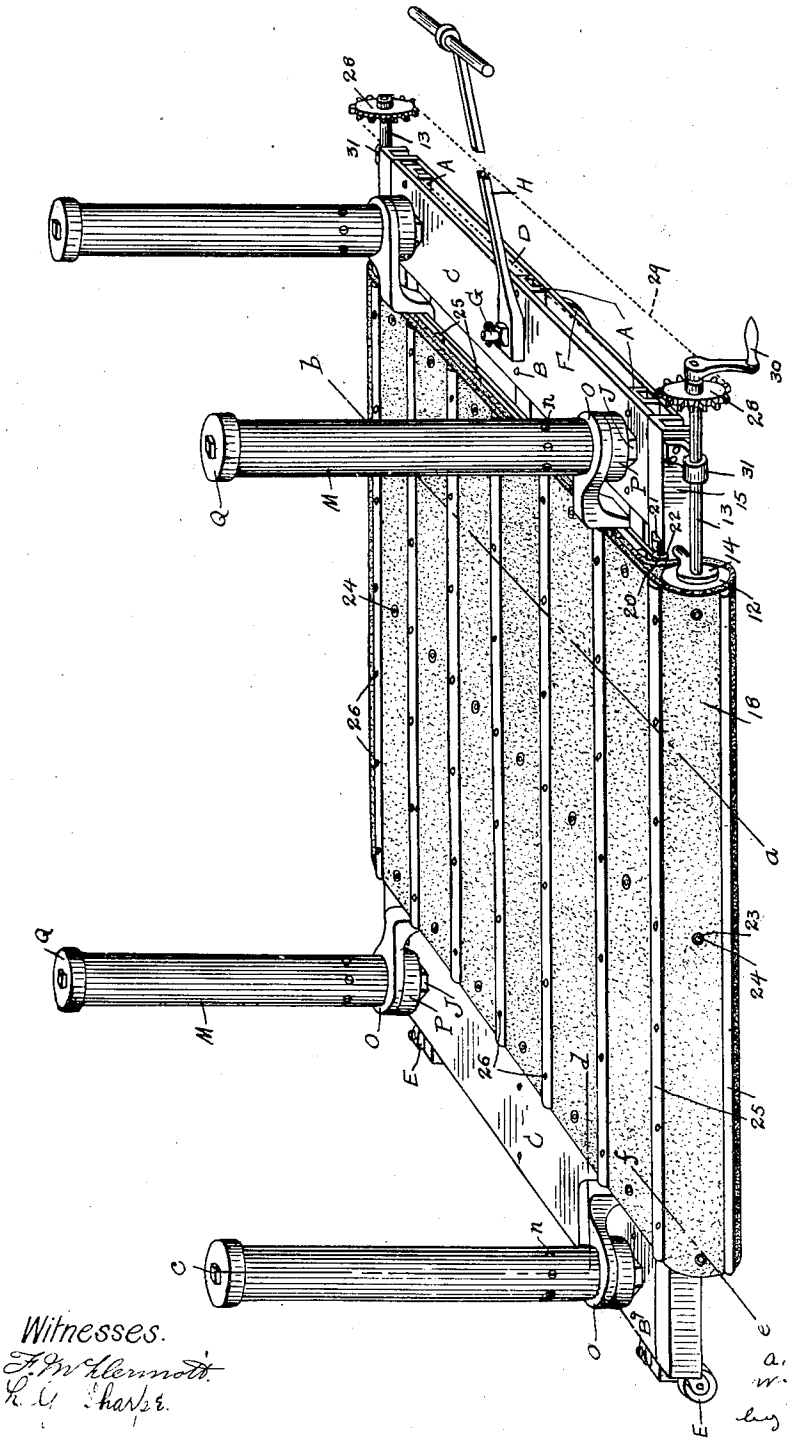


Fig. 1.

Witnesses.
F. W. Clermont.
R. G. Sharpe.

Inventors.
A. R. Bannerman,
W. Summerton,
D. MacDonald.
by Edgerton & Edgerton
Attys.

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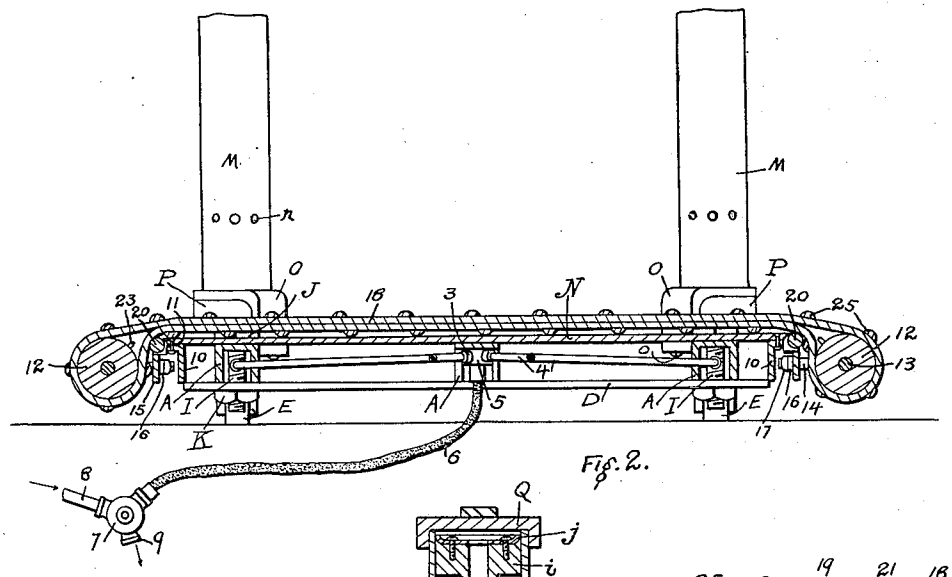


Fig. 2.

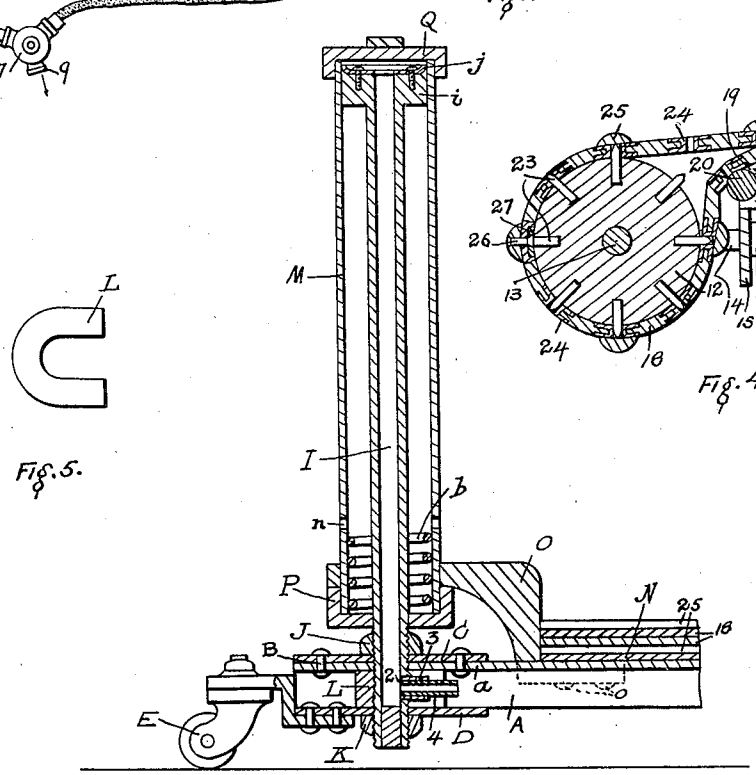


Fig. 3.

Fig. 5.

Fig. 4.

Witnesses.
F. McKlermott.
L. G. Sharpe.

Inventors.
A. R. Bannerman,
Wm. Summerton,
D. MacDonald,
by Egerton R. Case,
Atty.

UNITED STATES PATENT OFFICE.

ALEXANDER R. BANNERMAN, WILLIAM SUMMERTON, AND DONALD MacDONALD, OF WINNIPEG, MANITOBA, CANADA.

PNEUMATIC TRUCK.

No. 860,622. Specification of Letters Patent. Patented July 23, 1907.

Application filed May 2, 1906. Serial No. 314,838.

To all whom it may concern:

Be it known that we, ALEXANDER R. BANNERMAN, WILLIAM SUMMERTON, and DONALD MacDONALD, subjects of the King of Great Britain, all of the city of Winnipeg, in the county of Winnipeg, in the Province of Manitoba, Canada, have jointly invented certain new and useful Improvements in Pneumatic Trucks, of which the following is a specification.

Our invention relates to improvements in trucks, more particularly those employing fluid pressure for their operation, and the object of our invention is to provide an apparatus of the class described so that heavy weights may be quickly and easily handled without damaging or injuring same.

It is well known that in connection with the handling of heavy trunks and boxes and other heavy articles to and from freight cars, a great deal of damage is caused often because of the carelessness of those handling same.

Now another object of our invention is to reduce the number of breakages of articles handled by railroads.

A still further object is to construct a simple but very strong and durable apparatus of the character before described, and a still further object of our invention is to construct the truck as low as possible, that is to say, as near the ground or platform as may be possible in order to reduce to a minimum the distance that the weight to be carried by the truck will have to be lifted in order to be loaded thereon, and it consists essentially of a movable truck or base which supports a plurality of hollow pistons each held within a cylinder secured to or formed a part of a vertically-movable platform, and means for controlling the fluid to and from said pistons, in order to raise and lower said movable platform.

The invention still further consists in providing an endless conveyer in connection with the truck in order that the burden carried thereby may be delivered to the side of said truck, as hereinafter more particularly explained.

Figure 1 is a perspective view of our preferred form of truck. Fig. 2 is a vertical cross-section on the line *a—b*, Fig. 1. Fig. 3 is an enlarged vertical section on the line *c—d*, Fig. 1. Fig. 4 is an enlarged vertical section on the line *e—f*, Fig. 1, and Fig. 5 is a detail hereinafter referred to.

In the drawings like characters of reference indicate corresponding parts in each figure.

The truck or base is preferably constructed of three longitudinal supports A (which are preferably made out of angle-iron) to which are secured, after any suitable maanner, and preferably by means of bolts B, top and bottom plates C and D, and at both ends. Secured to said base or truck after any suitable construction are the back casters E. The front caster F is also secured to said truck after any suitable manner. We do not claim any particular way of attaching these casters or wheels to the truck, as it is in the capacity of one skilled in the art to which our invention appertains to provide a truck suitable for our invention having suitable casters or wheels in order to permit of its movement or transportation.

In order to steer the truck, the stem G of the front caster F extends through the plates C and D and through the center longitudinal support and above the plate C in order that the handle H may be attached thereto after any suitable manner well known to one skilled in this art, in order to turn said caster so as to guide the truck in the desired direction. Supported at each corner of the truck or base after any suitable construction, is a hollow piston-rod I. According to the construction shown for supporting these piston-rods in place, we pass same down through the plates C and D and through the outside longitudinal supports A. The outside lower portion of the piston-rods is threaded and operating on the threaded portion above the plates C is a nut J. Operating on the threaded end of the piston-rods is a nut K which screws against the plate D. By means of the U-shaped block L (which fits between the top of the side longitudinal supports A and the bottom plates D), it will be understood that when the nuts J and K are screwed tightly against their respective plates there will be no danger of said plates and said longitudinal supports buckling, by reason of the support given by the U-shaped block L.

Surrounding the piston-rods I are any suitable cylinders M which are secured after any suitable construction to the vertically-movable platform N in such a manner as to give support thereto at or near the outer corners of same. According to the construction shown for supporting the cylinders to said platform N, we show brackets O substantially Z-shaped, which are suitably secured as by rivets *o* to the platform N at their lower portions. The upper portions of these brackets are pierced so as to surround a portion of the lower end of the cylinders M and rigidly support same. Inclosing the end of these cylinders are caps P which have reciprocating movement with said cylinders. The upper ends of said cylinders are closed by suitable caps Q. In order to elevate the platform N motive fluid is passed into said cylinders through the piston-rods I and their pierced heads *i* and through the pierced packing *j* secured to said heads *i* after any suitable manner. This fluid pressure will exert force against the tops of said cylinders and raise the platform the required height. According to the construction shown for passing a fluid, preferably air, to and from said cylinders, we provide the piston-rods I with holes 2 in which fits a nipple 3 each of which receives a pipe 4 leading from a common coupling 5 with which is connected,

after any suitable manner, the conduit 6 which conveys the motive fluid from any suitable source of supply to said coupling. And as said coupling 5 is preferably centrally placed it will be understood that the amount of motive fluid passed into each of the said cylinders will be equal, thus uniformly raising up the platform N.

By means of any suitable three-way valve 7 coupled to the conduit 6, it will be understood that the passage of the motive fluid to and from said cylinders will be controlled. By means of the pipe 8 the motive fluid is fed into said three-way valve 7 and thence to the conduit 6. In order to exhaust the fluid out of said cylinders and thus lower or partially lower the platform N, the three-way valve is turned so as to cut off the supply of motive fluid through the pipe 8 and exhaust the motive fluid from the conduit 6 and the cylinders through the exhaust-port 9 formed a part of said three-way valve. We have not shown a construction of this three-way valve because its construction is well known by one skilled in this art. A still further reason for not illustrating the construction of this valve is the fact that we do not confine ourselves to using a valve of such nature, as any suitable controlling valve may be used in connection with the passage of the motive fluid to and from the cylinders.

In order to prevent damaging of the truck by the passing into the cylinders of too much fluid, we provide a safety-valve construction as follows: In the sides of the cylinders M are constructed holes *n*, preferably a short distance above the brackets O. In the lower ends of said cylinders M and resting upon the caps P are springs *b*. When the platform N raises up a certain height the holes *n* are moved above the packing *j*, consequently permitting the escape of motive fluid from out the cylinders, thus reducing the pressure and preventing the further elevation of the platform N. Should the motive fluid be turned suddenly into said cylinders so as to cause the platform N to be raised up quickly, we prevent the injurious impact between the cylinders M and the piston-rods I by providing the springs *b* placed as before described, which will abut against the under side of the piston-head *i* and absorb a considerable portion of the energy within the motive fluid when the platform N has been raised to a certain height, thus preventing the injury to the parts before described.

The parts of our truck are preferably made of steel, particularly the platform N, and consequently it will be understood that even very heavy weights can be readily moved along same. Now in order to reduce to a minimum the expenditure of energy necessary to move the weight resting directly upon the platform N, we provide a suitable endless conveyer the preferred form of construction of which we will now describe. Secured down each side of the platform N and underneath the outer edge of same is a longitudinal support 10 secured by rivets 11 to said platform. This longitudinal support is preferably U-shaped in cross-section. 12 are rollers provided with spindles 13 which have bearing in the brackets 14 secured in the side 15 of the longitudinal supports 10. By means of the pierced lugs 16, the brackets 14 are suitably supported. The inner ends of said brackets are threaded and receive nuts 17 which jam against the lugs 16 and thus keep said brackets in position. It will of course be understood upon inspecting the drawings, that a roller 12 is provided down each side of the truck. Passing over the rollers and above the platform as shown, is an endless belt 18 made of any suitable material, such as heavy canvas or leather.

In order to prevent friction, on the side edges of the platform N, same are cut away as shown at 19 and a roller 20 is journaled in proximity thereto by means of the bracket 21 secured to the top of the longitudinal supports 10. In order to permit of the positioning of the rollers 20 the outer corner of the longitudinal supports 10 are cut away as shown at 22. Upon inspecting Figs. 2 and 4, particularly, it will be understood that the endless conveyer 18 does not come in contact with the edge of the platform N. Secured in the rollers 12 are a plurality of pins 23, the outer ends of which are preferably pointed as shown and project a suitable distance beyond the periphery of said rollers in order that they may engage in the metallic eyelets 24 secured in said endless conveyer.

Upon inspecting Fig. 4 it will be understood that when the rollers are turned the endless conveyer 18 must essentially be moved by reason of the operation of the pins 23 in the metallic eyelets 24. These metallic eyelets are placed in position so that where two portions of the conveyer operate in opposite directions, there will be no undue friction. In order to reduce the friction of the endless conveyer against the platform N and also to facilitate the purchase between said conveyer and the weight that may be supported thereon, we provide a plurality of longitudinally-placed slats 25 secured by rivets 26 to said endless conveyer. By means of the metallic pieces 27 the rivets 26 are securely held in the conveyer, and thus securely hold the slats in position. These rollers 12 may be operated by any suitable means. According to the construction shown for this purpose, the spindles 13 are extended and provided on their outer end with sprocket-wheels 28 over which pass the sprocket-chain 29 (shown in dotted lines). By means of any suitable handle 30 one of the spindles is rotated, thus rotating both of said sprocket-wheels and through the medium of the spindles 13 revolving the rollers 12 and moving the conveyer 18. By means of the brackets 31 secured to the side 15 of the longitudinal supports 10 the spindles 13 have additional bearing.

Although we have shown and described a conveyer for use in connection with our truck, we do not confine ourselves to using same, no matter what its construction may be.

It will be obvious to one skilled in this art that changes may be made in the construction shown, and we do not confine ourselves to same and state that we may make various changes or alterations therein without going outside of the scope of the appended claims.

What we claim as our invention is:

1. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons, and means for controlling fluid to and from said pistons in order to raise and lower said movable platform.

2. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and

designed to inclose said hollow pistons; means for controlling fluid to and from said pistons in order to raise and lower said movable platform, and means carried by said platform and coöperating therewith so as to move a burden carried by said platform to one side thereof.

3. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons; means for controlling fluid to and from said pistons in order to raise and lower said movable platform; an endless conveyer carried by said platform, and means for operating same.

4. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons; means for controlling fluid to and from said pistons in order to raise and lower said movable platform; rollers journaled to said platform and down each side thereof; an endless conveyer operating around said rollers and above said platform, and means for operating said conveyer.

5. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons; means for controlling fluid to and from said pistons in order to raise and lower said movable platform; rollers journaled to said platform and down each side thereof; an endless conveyer operating around said rollers and above said platform; antifriction rollers journaled to said platform and in proximity to each side thereof, over which said endless conveyer passes, and means for operating said conveyer.

6. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons; means for controlling fluid to and from said pistons in order to raise and lower said movable platform; rollers journaled to said platform and down each side thereof; an endless conveyer operating around said rollers and above said platform; antifriction rollers journaled to said platform and in proximity to each side thereof over which said endless conveyer passes; a plurality of longitudinal slats or strips secured to said conveyer, and means for operating said conveyer.

7. An apparatus of the class described, comprising a movable truck or base consisting of longitudinal metallic supports and upper and lower plates secured at outer ends of same and crosswise thereto; hollow pistons secured to said truck or base by their lower threaded ends extending through said upper and lower plates and the adjacent longitudinal support; nuts screwing on said threaded ends and against said upper and lower plates; conduits or pipes for a motive fluid opening into said hollow pistons through an opening in their ends; cylinders secured or attached to said platform and designed to inclose said hollow pistons, and means for controlling fluid to and from pistons in order to raise and lower said movable platform.

8. In an apparatus of the class described, the combination with a movable platform, of a roller journaled down each side of said platform; an endless conveyer passed thereover and operating on the upper side of said platform; antifriction rollers journaled down each side of said platform and in proximity to the side edge thereof in order to keep said endless conveyer from contact with the edges of said platform, and means for operating said conveyer.

9. In an apparatus of the class described, the combination with a movable platform, of a roller journaled down each side of said platform; an endless conveyer passed thereover and operating on the upper side of said platform; anti-friction rollers journaled down each side of said platform and in proximity to the side edge thereof in order to keep said endless conveyer from contact with the edges of said platform; metallic eyelets secured in said endless conveyer; pins secured to said rollers and operating in said metallic eyelets in order to provide positive means for operating said conveyer, and means for operating said rollers.

10. In an apparatus of the class described, the combination with a movable platform, of a roller journaled down each side of said platform; an endless conveyer passed thereover and operating on the upper side of said platform; anti-friction rollers journaled down each side of said platform and in proximity to the side edge thereof in order to keep said endless conveyer from contact with the edges of said platform; metallic eyelets secured in said endless conveyer; pins secured to said rollers and operating in said metallic eyelets in order to provide positive means for operating said conveyer; a plurality of longitudinal slats or strips secured to said conveyer, and means for operating said rollers.

11. An apparatus of the class described, comprising a movable truck or base; hollow pistons secured thereto at or near each corner thereof and provided with flared heads; a vertically-movable platform; cylinders secured or attached to said platform and designed to inclose said hollow pistons and provided with small holes in their lower portion; springs within said cylinders and resting in the bottom thereof and around said hollow pistons therein, and means for controlling motive fluid to and from said pistons in order to raise and lower said movable platform.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALEXANDER R. BANNERMAN.
WILLIAM SUMMERTON.
DONALD MACDONALD.

Witnesses:
GEO. F. MUNROE,
NORMAN MATHESON.