Aug. 25, 1936. G. J. HOLT ET AL 2,052,468

BALLASTING MACHINE

Filed Feb. 24, 1931 2 Sheets-Sheet 1

FIG. 1.

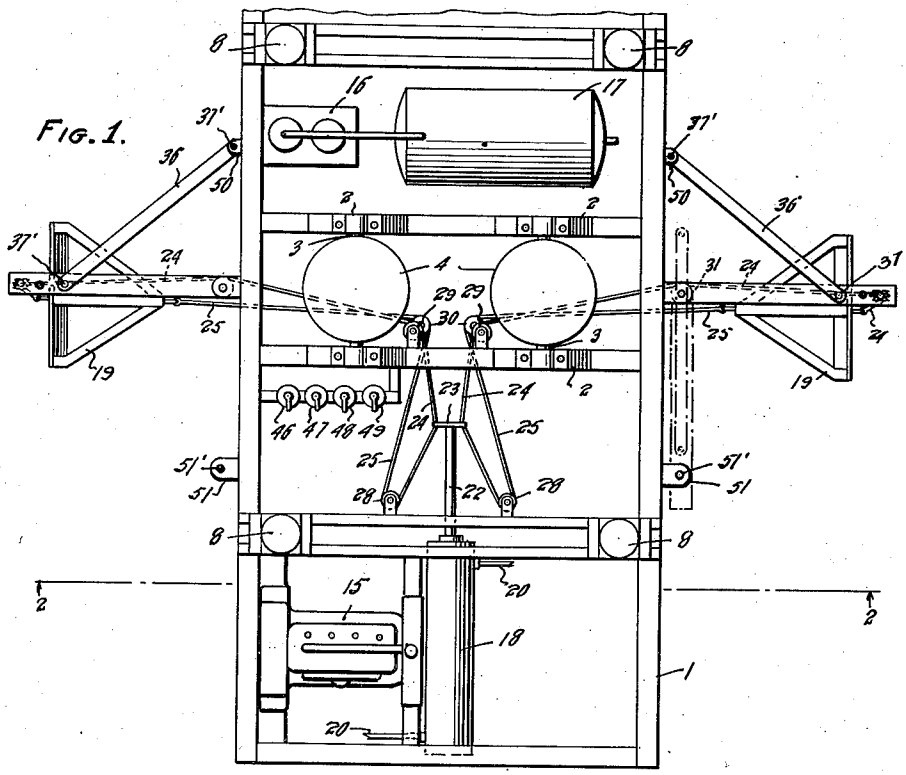
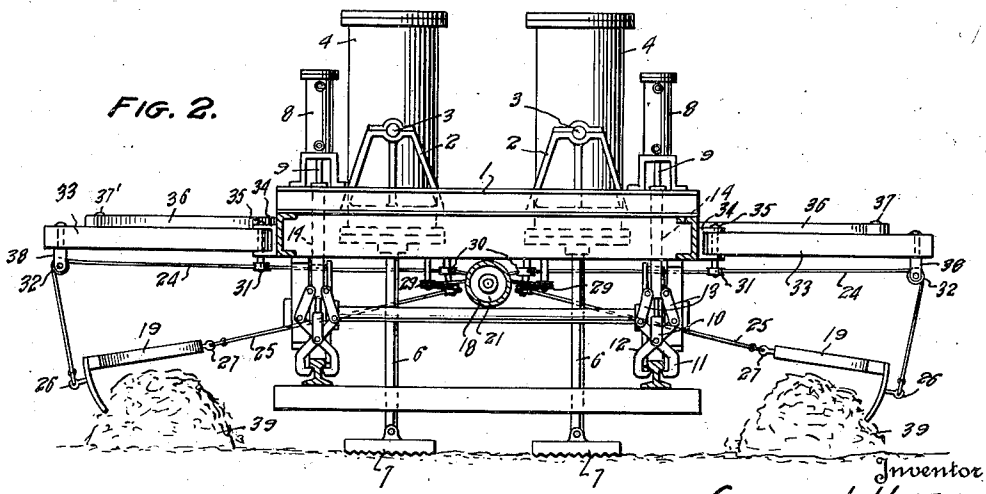


FIG. 2.



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FIG. 3.

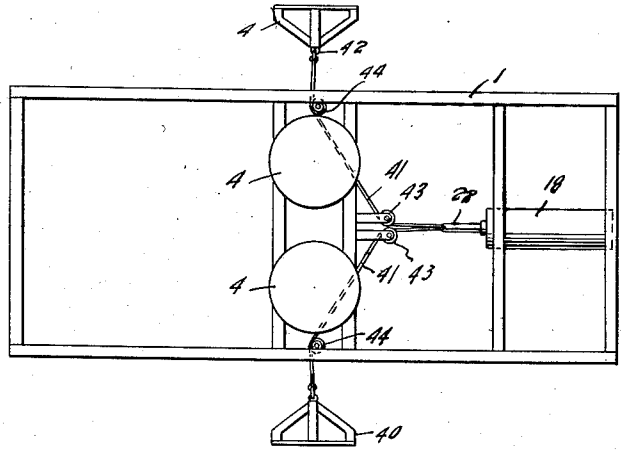


FIG. 4.

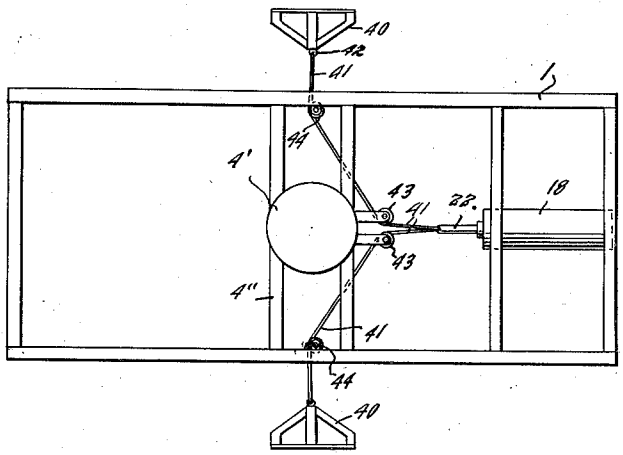
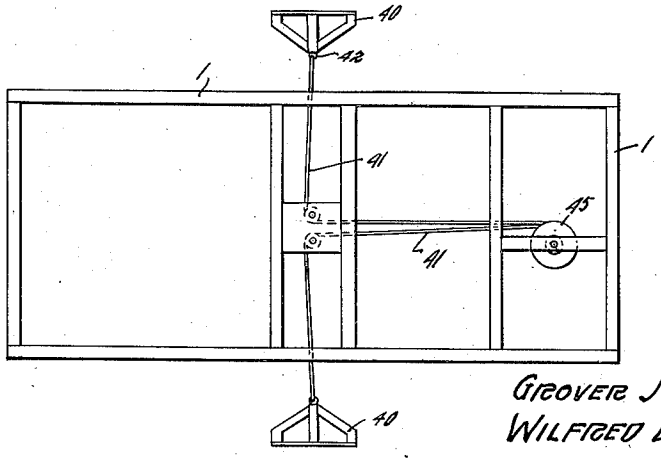


FIG. 5.



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2,052,468

BALLASTING MACHINE

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Application February 24, 1931, Serial No. 517,944

14 Claims. (Cl. 104—8)

The invention relates to railway track machines, and more particularly has reference to that type of device for use in track construction and track maintenance.

This application is a continuation in part of our application Serial No. 431,520, filed February 26, 1930.

In the construction and maintenance of a railway track, there are a multiplicity of operations necessary, many of whch have been carried out manually heretofore. One of the most serious problems in this endeavor is the securing and maintenance of proper ballasting. Our invention is of particular value for this type of work, although we have made provision for its use for various other railway purposes. We have, therefore, devised a compact, relatively light piece of railway equipment, having a wide range of utility.

When railway track is laid, even on a newly finished roadbed, there are a considerable number of depressions along the length of the track. It is hence necessary to raise the track at these points and place ballast under the ties so as to bring all points on the track to substantially the same elevation. Not only do low spots exist in newly laid and unused track, but such a condition develops through traffic travelling over the track. Hence there is the continual necessity of performing maintenance work, such as raising and placing additional ballast under the ties, for the purpose of maintaining the track at an even elevation.

The customary practice in ballasting track is to raise the same by means of hand jacks, and work ballast under the ties, after which the track is lowered and the ties are tamped. When there is a long section of track which is relatively low, ballast for this operation is usually deposited upon the track or the sides thereof, and is manually worked under the ties. In instances where a section of track is only a trifle low, yet must be levelled, it is customary to obtain ballast from the sides of the roadbed as well as from ground in the vicinity of the track.

Our invention has for its major object the provision of a single piece of railway equipment adapted to be used in various different operations necessary in the construction and maintenance of a railway track.

Another major object is the provision of a suitable car structure adapted to run upon a railroad track with means thereon for scraping ballast under the ties of the track.

An equally important object of the invention is the provision of fluid pressure operated means for moving a scoop towards the center of the track so as to draw ballast under the sides thereof.

Yet another object of the invention is the provision upon a railroad car of a mechanism for moving a scoop on each side thereof towards the center of the car, and adapted to be placed in an inoperative position where it will be free from contact with objects adjacent the track.

Still another object of our invention is the combination with a single piece of equipment of a track jack and ballasting device.

A further object of the invention is the designing of a ballasting machine to be associated with a track raising and shifting machine.

A still further object of our invention is the provision of a track raising and shifting device carrying a plurality of scoops adapted to move ballast towards the center of a railroad track, the scoops being moved by fluid pressure actuated mechanism.

With these and other objects in view, which may be incident to our improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising our invention may be varied in construction, proportions and arrangement without departing from the spirit and scope of the appended claims.

Our invention broadly consists in the provision in a single piece of railway equipment, of devices capable of subserving various functions which are necessary in the construction and maintenance of a railway track. For instance, in our preferred form we include in one machine devices for merely raising the track free from the roadbed, for shifting the track to various positions, and for aiding in the proper ballasting of the track. These uses to which our invention may be put, either individually or collectively, are of particular value, especially when it is remembered that prior to this time, these different operations were performed either manually or by separate pieces of equipment. The combination of operations which our invention is capable of performing effects a material economy in capital outlay, time and labor.

In order to make our invention more clearly understood, we have shown in the accompanying drawings means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular constructions which, for the purpose of explanation, have been made the subject of illustration.

In the drawings:

Figure 1 is a diagrammatic plan view of the ballasting machine forming the subject matter of our invention.

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1, and shows in detail the construction allowing the ballast scoops to be moved inwardly and outwardly of the car.

Figure 3 is a diagrammatic plan view of a modified form of our invention associated with a two cylinder fluid pressure actuated track handling machine.

Figure 4 is a diagrammatic plan view of the ballasting device of Figure 3 associated with a single cylinder fluid pressure actuated track handling machine.

Figure 5 is a diagrammatic plan view of the form of the invention shown in Figures 3 and 4 associated with a flatcar, the fluid pressure actuated mechanism being of a different type from that disclosed in the former figures.

We desire it to be distinctly understood, however, and will point out more fully hereinafter, that the broad idea of our invention is capable of achievement in various ways other than those specifically disclosed in the drawings.

Throughout the drawings, similar reference numerals refer to like parts in the different views. In the form of the invention shown in Figures 1 through 4, a railroad car 1 has mounted thereon suitable track raising and shifting mechanism. For example, in Figures 1 and 2 there is fixedly secured to each side of the car a pair of pedestals 2, upon which bosses 3 of a fluid pressure cylinder 4 are rotatively mounted. By this construction, and with the use of a suitable operating wheel or other suitable device, the cylinders 4 may be angularly adjusted as desired. Suitable means may be provided, such for instance as shown in our copending application Serial No. 561,262, filed September 4, 1931, whereby the cylinders 4 may be locked in a substantially vertical position. When so locked, or if perchance manually held vertically, the cylinders will serve as a jack to raise the car and track clear of the roadbed. When unlocked, the cylinders may be manipulated for the purpose of shifting the track laterally as will be more fully pointed out hereinafter.

If the exigencies of operation never require the shifting of the track, a slightly simpler structure than that shown in Figures 1 and 2 may be employed, without sacrificing the efficiency of the ballasting operation. In such a case, the cylinders 4, rather than being pivotally mounted upon the car frame by trunnions, may be rigidly mounted upon the frame. With such a construction, the device will serve both as a jack and ballasting machine.

Within each cylinder there is provided a suitable piston to which is secured a piston rod 6 having pivotally connected at its end a shoe 7. In the event that the cylinders 4 are not pivotally mounted on the pedestal 2, the shoe 7 may be rigidly mounted on the rod 6, although even in this situation it is preferable to pivot the shoes to the rods, in order to more efficiently function on uneven ground. Should the car be clamped to the track and the cylinders maintained in a vertical position, it is evident that upon moving the pistons within the cylinders 4 downwardly, each pedestal or shoe 7 will contact with the roadbed, and upon continuing the actuation of the piston, the car and track will be raised, as is disclosed in Figure 2.

For the purpose of allowing the car to be clamped to the track, there are mounted thereon four clamp cylinders 8, two on each side of the car. Each clamp cylinder is provided with a suitable piston to which is secured a piston rod 9, the lower end of which is connected to a yoke 10 which is in turn pivotally secured to a pair of crossed rail clamps 11 and 12. Each rail clamp is connected by means of a toggle joint 13 to a lifting bar 14 which surrounds the piston rod 9 and through which the piston rod is freely slidable.

As may be noted in Figure 2, the upper end of each lifting bar is provided with an enlarged head, which when the clamps are secured to the rail, is adapted to bear upon the body of the car and free the clamp cylinders of stresses imposed during lifting and/or shifting operations.

From an inspection of the drawings, it will be evident that, should the piston of each clamp cylinder be raised upwardly the clamps will be disengaged from the rails, and upon continued actuation, the yoke 10 on the end of the piston rod will contact with the end of the lifting bar 14 and hence raise the same and entirely free the clamps from engagement with the rail. Obviously, upon lowering the piston and piston rod within each clamp cylinder, the lifting bar 14 will be lowered until its head contacts with the car body, while further actuation of the piston will result in engagement of the clamps 11 and 12 with the track.

It will be appreciated that alternative forms of clamps may be employed, such as of course, mechanical rather than fluid pressure actuated means. Furthermore, the number of clamps might vary, depending on the conditions of operation.

In order to provide suitable working fluid for the purpose of clamping the car to the track and raising and/or shifting the car and track, there is mounted upon the car body a suitable prime mover or power source 15 which, through any suitable means, is connected to an air compressor 16, the latter discharging compressed air into a tank or reservoir 17. By the use of pipe lines or hose connections, the air from the tank 17 is led to suitable valves 46 and 47, respectively, employed for controlling the flow of working fluid into and out of each of the lifting cylinders 4. The valve 48 controls the admission and exhaust of fluid for the clamp cylinders 8. Exhaust air from the cylinders may of course be led directly into the atmosphere, or if desired, may be exhausted through a suitable modifying device.

While a fluid pressure means such as compressed air has been described, it will be obvious that the mechanism may be operated hydraulically. This may be accomplished by substituting a pump in the place of the air compressor, its intake end being connected to a liquid reservoir, and its discharge end to the control valves, which are in turn connected to the upper and lower ends of each lifting cylinder and each clamp cylinder. Through the use of a return line, also connected to the control valves, liquid forced out of the cylinders may be returned to the reservoir or sump. With such a construction, a suitable pressure bypass may be provided by the use of a pipe line connecting the discharge side of the pump with the liquid reservoir.

For the purpose of simplifying the drawings, connections between the prime mover and the air compressor or pump, as well as the pipe lines and control valves, have not been fully disclosed.

Likewise, it will be appreciated that the prime mover 15 may be connected to an axle of the car so as to propel the same in any direction along the track, though this feature has not been shown in the drawings. Through the use of suitable gears, clutches, sprockets, chains, or any combination of these, the prime mover may be connected and disconnected from the air compressor or pump as well as the driving axle of the car.

In addition to the track handling mechanism mounted upon the car, there is also provided a suitable cylinder 18 for moving the scoops, buckets, or raking devices 19, upon each side of the car, in order that ballast or other material may be pulled towards the center of the track. Each end of the cylinder 18 is connected to the air storage tank or reservoir by means of pipe lines 20 in which line is positioned a suitable control valve 49, the cylinder being provided with a piston 21 and piston rod 22. It will, of course, be appreciated that the size and shape of the scoops 19 may be varied to meet particular conditions of operation. It may be desirable to have the scoops or shovels 19 of greater or less comparative width than those indicated in Figure 1.

Upon the end of the piston rod 22 there is mounted a yoke 23, or arm, to each end of which are secured the ends of cables 24 and 25, the other end of the cable 24 being secured to the rear of the scoop, as indicated at 26, while the opposite end of the cable 25 is secured to the forward end of the scoop as indicated at 27. The piston 22 in Figure 1 is shown in retracted position, and upon the expansion stroke, the shovels 19 will be drawn toward the track.

Mentioned as one of the objects of our invention was the provision of a ballasting device having scoops on each side of a car capable of being moved inwardly and outwardly of the car. In order to accomplish this, the cables 24 and 25 are guided by suitable sheaves or pulleys 28, 29, 30 positioned upon the car, and the pulleys 31 and 32 on the folding or collapsing arms 33 which extend outwardly from the car perpendicular to its sides. As may be noted in Figure 2, each side of the car is provided with a substantially channel-like member 34 within which the inner end of each arm 33 is pivotally mounted by means of a pivot pin 35. For the purpose of bracing each arm, when the machine is in operation, a brace member 36 is pivotally secured to the arm by means of a pin 37, the inner end of the brace 36 being detachably connected to the frame of the car in any suitable manner, as for example by means of the pin 37'.

It has been previously indicated that the means for connecting the cable to the scoops as indicated at 26 and 27 are of the detachable type, so that when desired the scoops may be disconnected from their cables. This allows the end of the cables 24 and 25 to be suitably secured to rings or other devices carried on the side of the car. By such an arrangement, each arm 33 may be swung so that it is parallel to the car side and secured in such position by means of the latch or catch mechanism, comprising the bracket 51 and pin 51'. Each brace arm 36 may be disconnected from its bracket 50 so as to allow it to lie along its arm 33 as indicated by the dotted lines of Figure 1. The brace arm 36 may be secured to the car frame or the main arm 33 when the latter is folded upon the frame. Various other forms of scoops or ballast moving means other than those shown on the drawings may be employed. The particular embodiment disclosed and described herein, however, suffices to accomplish the desired results and to sufficiently illustrate the inventive concept.

From the foregoing description, the operation of the device will at once be apparent. For example, assume that the arms 33 and brace arms 36 are in collapsed position parallel to the car sides and the scoops are upon the car. The car is run to a position where ballast is to be placed under the track. At such a point, the travel of the car is stopped by disconnecting the prime mover from the driving axle. Although not specifically shown in the drawings, the car may be provided with a suitable brake to arrest travel of the car and to maintain it stationary with respect to the track during the ballasting, shifting, or jacking operation.

The arms 33 may be swung to the extended position and secured in such position by connecting the inner ends of each brace arm 36 to the car body. After this, the scoops are removed from the car and have their ends secured to the cables 24 and 25 in the manner shown in Figure 2.

Upon actuation of the clamp cylinders, the car may be clamped to the track. Both lifting cylinders are then positioned and maintained as shown in Figure 2, and the shoes 7 lowered to engage the ground or roadbed. Upon further operation of the piston rods 6, the track is properly raised so that ballast may be scraped underneath the same. This ballasting may be accomplished by suitable actuation of the piston 21 so as to pull the scoops inwardly of the car and hence move the ballast as indicated by the reference numeral 39 towards the center of the track.

If it is desired to scrape more ballast under the track, the piston in the cylinder is actuated in the opposite direction so as to exert a pull or tension upon the cable 24, which results in moving each scoop outwardly, whereupon the piston may again be actuated so as to draw the scoops inwardly of the car and hence scrape more ballast towards the center of the track.

The ballasting having been completed, when it is desired to move the car to another low section, the lifting cylinders are actuated so as to lower the car and track, and the car is unclamped, after which it may be moved to the next place desired and the same operations as those outlined above carried out. Where there are no obstacles close to the track, it will be appreciated that it is not necessary to collapse the arms. If there are obstacles in the path of the car, however, the scoops may be disconnected from the cables, placed upon the car, and the arms swung inwardly towards the car. Hence the car may be run to any position desired so as to clear the track on which it is working in the event of approaching traffic, or for other causes.

It will be appreciated that where it is desired to raise only one side of the track, the lifting cylinder on that side will be the only one employed. Hence, where it is only necessary to use one scoop, the other may be detached from its cables. Suitable mechanism, if desired, may be associated with our device in order to selectively operate each of the scoops. For instance, separate fluid pressure actuated mechanism may be employed for each scoop.

Not only may the device shown in Figures 1 and 2 be employed for raising the track, but by the use of one cylinder, adjusted at a suitable angular position, the track may be thrown or

shifted either to the left or right. For example, if it is desired to shift the track to the left, the left hand cylinder is tilted to the left, and its thrust boom or piston rod is lowered until the shoe thereon contacts with the ground. On the further actuation of the piston within the left hand cylinder the car and track, assuming of course that the car is clamped to the track, will be raised and shifted to the left. When conducting such an operation, it will, of course be advisable to withdraw the arms **33**, so that they are parallel to the sides of the car.

In Figures 3 and 4 we have schematically shown somewhat similar constructions to that shown in Figures 1 and 2. In these latter constructions, however, it is necessary to manually pull the scoops **40** from under the car after they have moved their loads towards the center of the track.

Figure 3 shows a car **1** which has mounted thereon a track shifting mechanism comprising the two lifting cylinders **4** which are fixed to the car. In this instance, however, the piston rod **22** is not provided with a yoke, and each scoop is connected thereto by means of a single cable **41**, one end of which is attached directly to the piston rod and the other end to one end of the scoop as indicated at **42**. Each cable runs over suitable guide sheaves or pulleys **43** and **44**. The operation of the machine shown in Figure 3 is similar to that disclosed in Figures 1 and 2, with the exception that after the scoops **40** are drawn towards the center of the track, they must be pulled outwardly from such position by hand. Each scoop **40**, as may be noted, is detachably secured to its cable as indicated at **42**. The structure shown in this figure obviates the arms and braces necessary to the device of Figures 1 and 2.

Figure 4 discloses a device similar to that shown in Figure 3, but with only a single lifting cylinder **4'**. This cylinder is mounted upon suitable trackways **4''** so as to allow its movement from side to side of the car as shown in more detail in our United States Letters Patent 1,784,963. With this exception, the operation of the machine shown in Figure 4 is of a similar nature to that of the machines already described. Through the use of gears, pulleys, chains, sprockets, and the like, the prime mover may be coupled to suitable mechanism for moving the single cylinder **4'** from one side of the car to the other so that the track may be raised and shifted, or merely raised. During raising operations, it will be appreciated that the cylinder **4'** is positioned at the center of the car, as shown in Figure 4, and is maintained by suitable means in a vertical position.

When the device shown in Figure 4 is used for a jacking operation, it will of course be necessary to maintain the cylinder **4'** in a vertical position, and furthermore, it is desirable that the spud or shoe, such as shown in Figure 2 at **7**, should be rigidly attached to the spud or boom **6**, in order to maintain the track in a raised position. We would advise that the shoe be of somewhat larger construction when this device is used as a jack in order to afford more bearing surface, and provision may be made for removing the shoe used for shifting and attaching rigidly to the boom or piston **6** a shoe of larger contact area. Of course, the mechanism for locking the cylinder **4'** in a vertical position may be similar to that shown in our copending application Serial No. 561,262, filed September 4, 1931. It will, furthermore, be appreciated that, while Figure 4 shows a ballasting apparatus similar to that shown in Figure 3, it may be provided with a structure similar to that disclosed in Figures 1 and 2, whereby the scoop or shovels **40** may be displaced either outwardly or inwardly of the car.

It is sometimes desirable to employ a relatively light car for the purpose of merely scraping ballast nearer to the rails. In such a case, the track raising and shifting mechanism may be dispensed with. When such practice is followed, a car similar to that shown in Figure 5 may be employed. The car has mounted thereon only the scraping or ballasting scoops **40** with fluid pressure actuated mechanism for pulling the same inwardly of the car. With such a ballasting machine, fluid pressure for operating the scoops may be supplied by any suitable means which may be mounted upon a second car adapted to be coupled to the machine. The second car may be provided with machinery for propelling it along the track if desired. In some instances, it may be even desirable to provide the car shown in Figure 5 with a prime mover for propelling the same, as well as means for generating the fluid pressure for actuating the ballasting scoops. Obviously, such practice would not exceed the spirit of the invention or the scope of the appended claims. Of course, it will be understood that, while Figure 5 merely discloses the broad idea of scoops operated by a mechanism mounted on the car, the device may be provided with extensible arms, similar to the arms **33** of Figures 1 and 2, together with other appropriate means for automatically displacing the shovel both outwardly and inwardly of the car.

Instead of the cylinder with piston and piston rod employed for moving the ballasting scoops **40**, we have disclosed in Figure 5 a compressed air or hydraulically driven hoist **45**. Of course, if desired, the hoist shown in Figure 5 may be associated with either of the disclosures given in Figures 1 through 4 in the place of the actuating cylinder shown. By providing separate hoists for each of the two scoops **40**, with appropriate clutches if both hoists are driven from a common source, the scoops may be selectively operated.

The ballasting machine shown in Figure 5 being of light construction, may be run upon track which is maintained in a raised position by means of manually operated jacks of the conventional sort used in railway track work. After the ballasting operation of the car shown in Figure 5, the track would, of course, be lowered and the car moved to the next low section where a similar cycle of operations would be repeated.

Each of the cars shown in the drawings may be provided with a suitable flooring throughout. However, for the sake of showing the ballasting mechanism used, only a partial flooring has been disclosed. Likewise, while it has been mentioned that the cables are detached from the scoops, it will be appreciated that by providing a trap-door or the like in the flooring over the actuating mechanism for the scoops, the cables or cable may be detached from the actuating mechanism, as well.

As stated at the outset, while the drawings in this application depict our invention as embodied in a device in which the various functions are performed by the use of fluid pressure, we do not wish to be limited to such a form of power.

For instance, the track raising and track shifting device may be actuated by mechanical means. When we use the words "mechanical means" in the specification and claims, we wish to be understood as including structures in which power is transmitted directly from an engine through suitable gear trains to the lifting or ballasting means. For instance, the boom or booms may be provided with rack teeth engaging with a segment or pinion, or the booms may be threaded and operated by means of a rotatable nut in order to raise or lower the booms.

Again, the source of power may be electrical, rather than compressed air or hydraulic pressure. Such an electrical construction might take the form of a solenoid within which the booms 6 may be energized to raise or lower the car or track. Of course, the prime mover or power source 15 may be an electrical motor if desired, which would function in the same way as the member 15 in Figures 1 and 2, or may through a series of gears directly operate the spuds or booms.

Furthermore, while we have disclosed fluid pressure means for actuating the shovels or scoops 19, we wish it to be clearly understood that the cylinder 18 or the hydraulically driven hoist 45 disclosed in the drawings may be replaced by mechanical or electrical means, as discussed hereinbefore in connection with the boom 6. For instance, a drum on which the cables 24 and 25 or 41 are wound may be substituted for the cylinder 18 or hoist, and be directly connected through a gear train to a source of power. Suitable clutch mechanism may be provided for operating such a drum, as desired. A plurality of such drums with corresponding clutches could be employed to selectively operate the scoops 19.

It will of course be understood a device similarly might be constructed which had manually operated means for raising and shifting the track and manually operated means for conveying the ballast toward the track. Such a structure might be especially desirable where it is necessary to keep the weight of the equipment at a minimum.

It is obvious from the foregoing that our invention comprehends, for instance, the following structures, which are listed exemplarily rather than limitatively: lifting and shifting means and ballast moving means, all actuated by fluid pressure; lifting and shifting means actuated by fluid pressure and ballasting means mechanically actuated; mechanically operated lifting and shifting mechanism and fluid pressure actuated ballasting means; lifting and shifting and ballasting means, all mechanically actuated; and various combinations of the foregoing with electrically operated and/or manually operated devices.

As heretofore pointed out, the track clamps 11 and 12 may be mechanically actuated in lieu of the fluid pressure means disclosed in the drawings, or these clamps may be operated electrically, or even manually.

For the sake of brevity, the foregoing modifications are not shown in the drawings, but they are embraced in our invention and we desire to claim them.

From the foregoing description it will be appreciated that we have devised a novel piece of railway equipment adapted to a wide range of utility. It is particularly applicable to track raising and shifting machines and may be used in conjunction therewith to great advantage in ballasting the track which has been raised. In addition to these features and those previously outlined, it may be observed that we have provided a device for ballasting a track which is of simple construction and at the same time may be operated with great ease.

While we have shown and described the preferred embodiment of our invention, we wish it to be understood that we do not confine ourselves to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

We claim:

1. A railway maintenance device, comprising a carriage adapted to be clamped to a track, means for raising the carriage and track free of the roadbed and to maintain them in said raised position, a support extending from the sides of the carriage, a member carried by said support and adapted to urge ballast and other material toward the track, and means adapted to move said member to and from the carriage.

2. A railway maintenance device, comprising a carriage engageable with the track, means for raising the carriage and track, a scoop adapted to urge ballast and other material toward the track, a support for the scoop, and a flexible means for moving the scoop to and from the carriage.

3. A railway maintenance device, comprising a carriage adapted to be clamped to a track, means for raising the carriage and track, an arm extending from the carriage and adapted to support ballast-moving means, actuating means for the ballast-moving means to urge the ballast toward the track when in a raised position.

4. A railway maintenance device, comprising a carriage, means for securing the carriage to a track, means for raising the carriage and track, means adapted to be extended beyond the sides of the carriage to support a scoop-like member, and means for moving the scoop-like member to and from the track.

5. A railway maintenance device, comprising a carriage adapted to be clamped to a track, means for raising the carriage and track free of the roadbed, a scoop adapted to urge ballast and other material toward the track, an arm foldable to the side of the carriage but adapted to be extended angularly therefrom, a cable adapted to support the scoop in conjunction with the foldable arm, and means to actuate the cable whereby the scoop is moved to and from the carriage.

6. A railway maintenance device comprising a carriage, fluid pressure means mounted thereon for raising the track free of the roadbed, other means also carried by the carriage and actuated by fluid pressure to urge ballast toward the track when in raised position, and a reservoir adapted to supply the raising and ballast moving means with fluid.

7. A railway maintenance device comprising a carriage, a thrust boom slidable within a cylinder mounted on said carriage and adapted to engage the ground to thereby raise the carriage and track, means carried by the carriage for urging ballast toward the track when the latter is raised, fluid pressure means for actuating the ballast moving means, and a reservoir for supplying fluid under pressure to the said actuating means and the cylinder.

8. A railway maintenance device comprising a carriage, a thrust boom slidable within a cylinder mounted on said carriage and adapted to engage the ground to thereby raise the car and

track free of the roadbed, means carried by the carriage for urging ballast toward the track when the latter is raised, a cylinder and piston for actuating the ballast moving means, a reservoir for supplying fluid to the cylinders, and means for compressing the fluid in the reservoir.

9. A ballasting machine comprising a car adapted to run upon a track and provided with means for raising the car and track, a device carried by the car for moving ballast under the track, and common means for operating the raising means and ballast moving device.

10. A railway maintenance device comprising a carriage adapted to be clamped to a track, means on the carriage for shifting the car and track or raising the car and track substantially vertically, means carried by the carriage for moving material toward the track, and common means for actuating the shifting and raising means and the material-moving means.

11. A railway maintenance device comprising a carriage adapted to be clamped to a track, a thrust boom slidably mounted on the carriage adapted to raise and support the carriage and track, other means carried by the carriage for moving material toward the track, and common means for actuating the thrust boom and the material-moving means.

12. A railway maintenance device comprising a carriage provided with a plurality of thrust booms adapted to raise and support the carriage and track, means carried by the carriage for moving material toward the track, and common means for actuating the thurst boom and material-moving means.

13. A railway maintenance device, comprising a carriage provided with means for raising a track, other means carried by the carriage and adapted to be angularly moved with respect to the carriage and to urge ballast and other material towards the carriage, and means to move said ballast-urging means to and from the carriage, and also to actuate the raising means.

14. A railway maintenance device, comprising a carriage adapted to be clamped to a track, means carried by said carriage for optionally raising or shifting the carriage and track, means extending beyond the sides of the carriage and adapted to engage ballast and move it toward the track, and common actuating means for the raising or shifting means and the ballast engaging means.

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