

(No Model.)

3 Sheets—Sheet 1.

F. O. KILGORE.
LOADING OR UNLOADING MACHINE.

No. 588,277.

Patented Aug. 17, 1897.

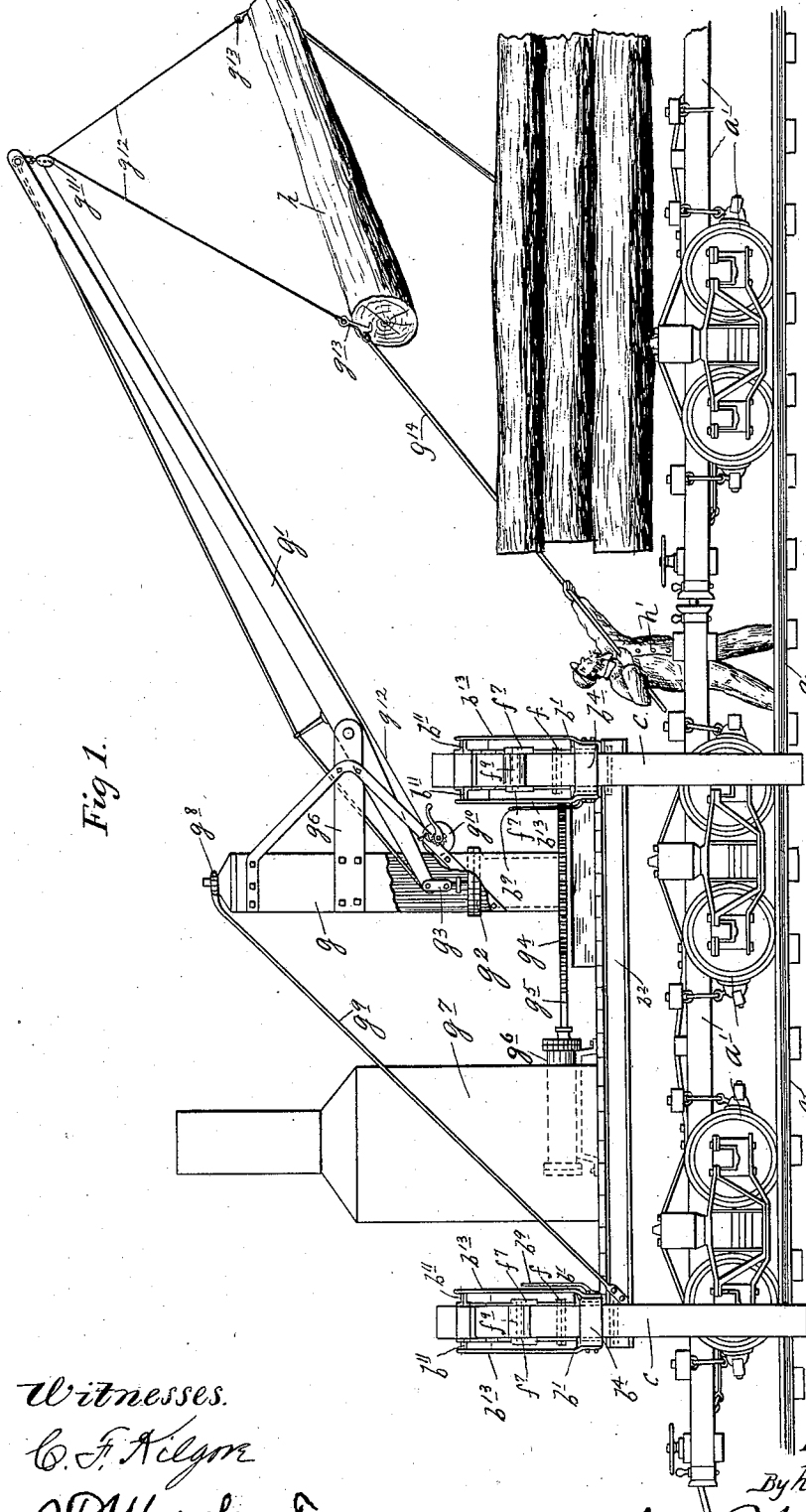


Fig. 1.

Witnesses.

C. F. Kilgore

R. D. Merchant,

Inventor.

Frederick O. Kilgore.

By his Attorney.

Law. F. Williamson

(No Model.)

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Fig. 2.

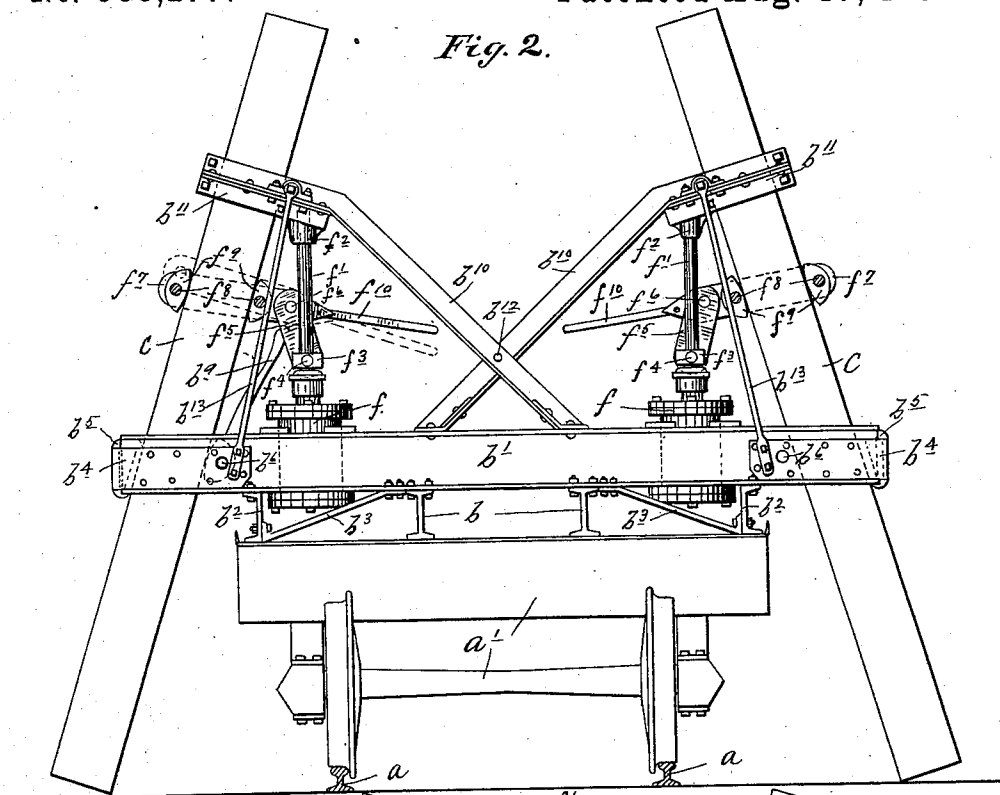


Fig. 3.

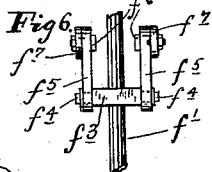
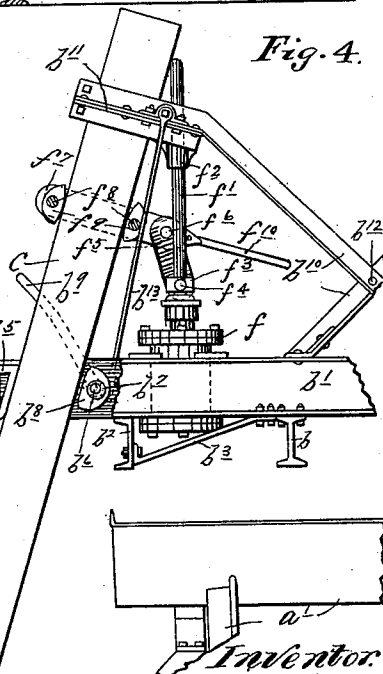


Fig. 4.



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Fig. 7.

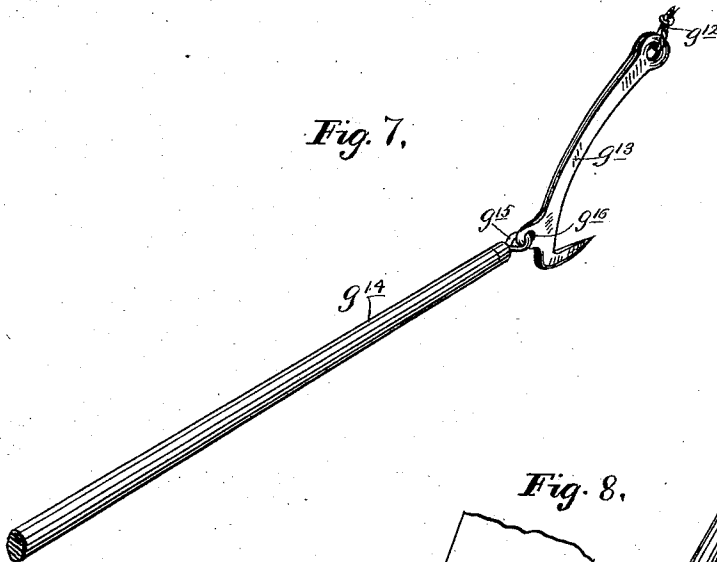
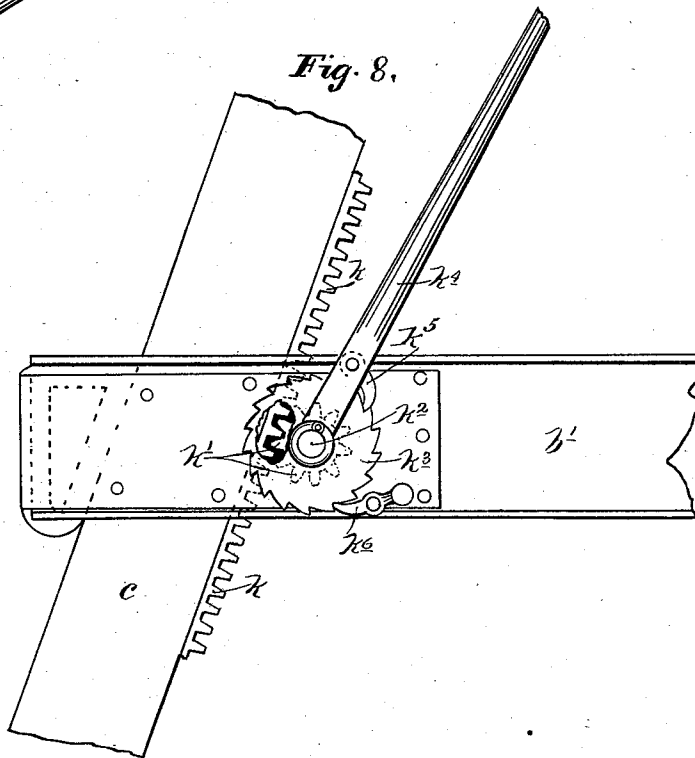


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

FREDERICK O. KILGORE, OF MINNEAPOLIS, MINNESOTA.

LOADING OR UNLOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 588,277, dated August 17, 1897.

Application filed November 4, 1895. Serial No. 567,790. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK O. KILGORE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Loading or Unloading Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is especially designed as an improvement in loading and unloading machines for better adapting the same to advantageous and economical use in loading cars, but is capable of general application wherever it is desired to vertically adjust a platform on its supporting-legs or the legs on the platform at will without turning the structure upside down. Otherwise stated, I provide a platform and legs so connected that either can be adjusted on the other in the vertical plane while remaining right side up, according to which is made the base of resistance. This feature of construction enables me to mount a loading and unloading machine in such a way that the same can be made to straddle a car and remain in a constant position until one car after the other is loaded thereby and be then dropped onto any empty car which happens to be under the machine and be carried off with the car to the point where the train is unloaded, when it can be again raised above the car, so as to straddle the same and be used for unloading the cars in succession under the reverse movement of the train.

To the ends above noted my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts—

Figure 1 is a side elevation showing my improved loading and unloading machine as it would appear when in working position for loading or unloading a logging-train with some parts broken away and others removed. Fig. 2 is an end elevation of the platform as it would appear when resting on the car before the legs have been elevated as required for transportation, the loading mechanism

being removed. Fig. 3 is a view in end elevation, showing one corner of the platform and car as the parts would appear after the grip had been raised on the leg by the up-stroke of the motor-piston when the platform and car serve as the base of resistance. Fig. 4 is a similar view of the same parts as they would appear after the motor had made its return or reverse stroke, so as to lift the platform on the grip and leg as a base of resistance for one step above the car. Fig. 5 is a detail showing the clutch or locking device for locking the platform and legs together in any desired relative adjustment. Fig. 6 is a detail showing connection from one of the motor-piston rods to the grip or clevis links. Fig. 7 is a detail in perspective, showing grapple-hook and pole for manipulating same, with some parts broken away; and Fig. 8 is a view in end elevation with some parts broken away, showing modified form of device for effecting the relative adjustment of the platform and legs.

a represents a railway-track, and a' represents flat cars thereon of the kind which are used on logging-roads for the transportation of logs.

b , b' , b^2 represent, respectively, longitudinal metallic I-beams, transverse channel-iron cross-beams, and the flooring, which parts together constitute the platform. The longitudinal I-beams b and the channel-iron cross-beams b' are bolted together and are suitably braced by stay-bars b^3 , so as to afford a very rigid and strong structure. Two cross-beams b' are used at each end of the platform, which are suitably spaced apart from each other and are embraced and tied together at their outer ends by yoke-shaped caps b^4 , securely bolted or riveted to the cross-beams. To the inner faces of the ends of the caps b^4 are fixed angular shoes b^5 , with the inner faces of the said shoes sloping outward from top to bottom. At a suitable distance inward from the fixed shoes b^5 is mounted in the cross-beams a rock-shaft b^6 , with an eccentric b^7 , which carries a clutching-shoe b^8 , which coöperates with the fixed shoe b^5 to form guides for the coöperating leg c at that corner of the platform. The rock-shaft b^6 is provided at one end with a hand-lever b^9 , by means of which the clutching-shoe b^8 may be

thrown into or out of clutching engagement with the leg *c*.

Pairs of rigid angle-iron bars *b*¹⁰ extend outward from points beyond the center of the cross-beams *b*¹ at an angle to the body of the platform and are connected at their outer or upper ends by pairs of channel-iron cross-plates *b*¹¹, suitably spaced apart and suitably set to form upper end guides for the cooperating leg *c* at that corner of the platform. The said arms *b*¹⁰, which extend outward from the common cross-beams to the opposite corners of the platform, cross each other and are rigidly connected at their crossing points by a cross-tie *b*¹². The outer ends of the parts *b*¹⁰ are further braced by stay-rods *b*¹³, connecting the same with the cross-beams *b*¹.

Between the cross-beams *b*¹, directly inward of each of the legs *c*, is fixed the cylinder *f* of the steam-engine. The piston-rod *f*¹ of the engine works upward through a guide-plate *f*², fixed to the overhanging angle-bar *b*¹⁰. The piston-rod is squared or otherwise enlarged, as shown at *f*³, and is provided with trunnions *f*⁴. The pins *f*⁴ connect the piston-rod *f*¹ to the lower ends of a pair of links *f*⁵, which pivotally connect at their upper ends to cross-rods *f*⁶, carried by a grip or clevis iron *f*⁷ *f*⁸, embracing the leg *c*. The said grips comprise the side strap *f*⁷, the cross-rods *f*⁸, and a pair of shoes *f*⁹, loosely mounted one on each of the said rods *f*⁸. To one of the side pieces or straps *f*⁷ is attached an inwardly-projecting lever-arm *f*¹⁰. With this construction of the said grip or clevis the same may be made to bind on the leg *c*, embraced thereby, or to move freely on the leg, according to whether the grip is set at right angles to the leg or at an oblique angle thereto.

The engines employed are of the ordinary standard construction which take steam on both sides of the piston. The valve-chest and valve mechanism are not shown, but would be of ordinary or any suitable construction, under the control of the operator on the platform through a hand-lever or connections of any suitable kind.

The action or operation will be readily understood by comparison of Figs. 2, 3, and 4. In Fig. 2 the parts are all in their normal position as they appear when the platform is carried by the car and the legs rest on the ground. By then manipulating any given grip or clevis by its operating-lever *f*¹⁰, so as to throw the same into its loose position on the leg *c*, as shown in dotted lines in Fig. 2, and so holding the same by hand until steam has been given to the engine on the under side of the piston the upward or out stroke of the piston will carry the grip upward on the leg into the position shown in Fig. 3, with the platform and car as the base of resistance. By then letting go of the hand-lever *f*¹⁰ the clevis or grip will assume its clutching position on the leg. By then giving the engine steam above the piston it will make

its reverse or return stroke by the cylinder rising on the piston against the grip and the leg as the base of resistance, so as to lift the platform away from the car or into the position shown in Fig. 4. By then operating the platform clutch-lever *c*⁹ the platform may be locked to the leg in its elevated position. Further steps of upward movement may be made by repeating the said actions until the platform is elevated to any desired height on the leg *c*. One or two steps of movement upward will be sufficient to afford the requisite clearance above the car.

The motors for the respective legs may be arranged either for independent action in succession or for simultaneous action under control from a common source.

Whenever it is desired to lower the platform onto the car or other desired point, the same may be readily done by reversing the motions above described. It is equally obvious that when the platform has been lowered onto the car the legs may be elevated or moved upward in respect to the platform, while the platform remains stationary on the car as the base of resistance, so as to bring the legs to any desired height required for clearance in transporting the machine on the car.

The platform is shown as equipped with a swinging crane *g* *g*¹, of which parts *g* represents the pivoted mast, and *g*¹ the boom pivoted to the mast. An engine *g*² is carried by the mast with its piston-rod connected through a link *g*³ with the inner end of the boom for imparting the necessary pivotal movements to the boom in respect to the mast. The mast is provided at its lower end with a large gear *g*⁴, which is engaged by a rack *g*⁵, carried by the piston of a horizontal engine *g*⁶ on the platform for imparting the swinging motions to the crane in the horizontal plane. *g*⁷ indicates a boiler for the supply of steam to all of the engines located on the platform. The valve mechanism for the crane-operating engines is not shown, but would preferably be of the design disclosed in my prior United States patent issued of date September 3, 1895, numbered 545,589, entitled "Power-crane."

The upper end bearing for the crane-mast is shown as afforded by an eye *g*⁸, carried at the upper end junction of a pair of stay-rods *g*⁹, rising from the platform.

A windlass *g*¹⁰ is shown as carried by the crane-mast, and the outer end of the boom is shown as provided with a guide-pulley *g*¹¹. The cable *g*¹², attached to the spool of the windlass, passes over the guide-pulley *g*¹¹ and is provided with a pair of hook-ended strands *g*¹³, which cooperate under the action of the windlass and guide-pulley as a grapple to engage the log *h* or other object endwise, as shown in Fig. 1 of the drawings.

In handling logs for loading or unloading a train two men work together, one at each end of the car. Hence one man *h* is available for each of the hook or grapple strands

g^{13} to engage the same with the ends of the log for manipulation by pole g^{14} . This improved form of grapple is a great convenience for handling logs, because it insures the proper centering of the log under the guide-pulley on the boom and enables the logs to be dragged in from a considerable distance to either side of the machine. The fact that the logs are thus properly centered when suspended by the boom and cable insures the log coming over the car or pile in a horizontal position, which enables the same to be properly positioned in much less time than with the ordinary form of grapple-tongs.

The great economy and advantage of a loading and unloading machine mounted in the manner described on a platform which can be carried with or be made to straddle a car at will is something that will be appreciated by all persons familiar with the work hitherto required for loading or unloading trains of cars. With this machine the platform may be elevated above the car and remain stationary in one position until the whole train has been loaded, one car after the other, thereby in succession. The machine may then be dropped onto the underlying empty car and be carried therewith to the unloading-point, where the machine can again be made to straddle the car in a stationary position until the train is unloaded thereby, one car after the other in succession, in the reverse order of loading.

While the platform and legs, connected for relative adjustment of either upon the other as a base of resistance in alternate order, are especially designed for supporting loading and unloading mechanism, it must be obvious that the same are capable of general application for a great variety of purposes, wherever such motions may be desired, regardless of the load which may be carried on the platform.

By reference particularly to Figs. 2, 3, and 4 it will be noted that the legs or spuds c are set on inclines with their lower ends flaring outward and bear such relation to the side margins of the platform that when they are lowered their lower ends project outward beyond the side margins of the platform, but that when the legs are raised their lower ends will be drawn inward of the side margins of said platform. This arrangement is important, as the opposite side legs, when supporting the platform, will be braced laterally against each other to steady the platform. When, however, the legs are raised, inasmuch as they will be drawn inward of the side margins of the platform they will clear any and all bridges or other structures which may be passed by the car itself.

The form of motors and the form of connections shown for rendering the same operative to effect the relative adjustments of the platform and legs is a convenient and serviceable one; but it must be understood that any other sort of devices might be em-

ployed which would give the motions required. For example, various other forms of motors might be used, or hand-power devices might be employed. The guiding and locking connections between the platform and the legs might also take various other forms.

For example, a simple form of hand-power device is illustrated in the modification shown in Fig. 8. Therein k represents a rack fixed to the inner face of the leg c , and k' represents a pinion in mesh with the said rack and fixed to the shaft k^2 , journaled in the cross-beams b' . The said shaft k^2 is provided with a ratchet-wheel k^3 . A hand-lever k^4 is loosely pivoted on the shaft k^2 and is provided with a pawl k^5 , engaging the ratchet-wheel k^3 . A lock-pawl k^6 , acting by gravity, also normally engages with the ratchet-wheel k^3 to hold the same wherever set. It is obvious that with this hand device (shown in Fig. 8) the platform or leg may be raised or lowered one on the other, according to which is made the base of resistance, with the same results as with the power devices shown in the principal views.

The pole g^{14} (shown in Figs. 1 and 7) is provided with a swivel-link g^{15} , which engages with an eye g^{16} on the back of the grapple-hook g^{13} . This construction enables the workman h' to readily manipulate the grapple-hooks g^{13} for engagement or disengagement with the log and to manipulate the log for properly directing the same, as shown in Fig. 1, when the hooks are engaged therewith.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a platform, of legs connected thereto, with freedom for vertical adjustment of either of said parts on the other, and sliding grips carried by said platform and constructed with parts which by extreme movements in either direction, engage said legs and positively force the same in either of two opposite directions, at will, substantially as described.

2. The combination with a platform, of legs connected thereto, with freedom for the vertical adjustment of either of said parts on the other, as a base of resistance, motors carried by one of said parts, and sliding grips carried by the other of said parts and subject to said motors, for effecting said relative adjustments, substantially as described.

3. A loading-machine, involving the combination with a platform adapted to rest upon and overreach a car, of hoisting mechanism mounted thereon, legs connected with the platform through guides which permit the vertical movement of said platform on said legs, or vice versa, sliding grips carried by the platform and operative on said legs, and locking devices for securing said platform and legs together in any set position, substantially as described.

4. A loading-machine involving the combination with a platform adapted to rest upon and overreach a car, legs connected with said platform through guides which permit the

vertical movement of said platform on said legs, or vice versa, and sliding grips carried by said platform and operative on said legs, involving each a pivoted lever f^7 provided with
5 a pair of pivoted friction-shoes f^9 working one on each side of the cooperating leg, substantially as described.

5. The combination, for handling logs and other objects, comprising a swinging crane, a
10 pulley or cable guide at the outer end of the boom, a windlass on the crane or crane-support, a cable subject to said windlass, over said pulley or guide, and provided with a pair of hook-ended strands, at its outer end, and
15 manipulating-poles pivoted to said hooks, all for cooperation, substantially as described.

6. The combination with a car-platform, of supporting-legs movable through seats formed in said platform, said legs being set
20 on downwardly-flaring angles and so related

to the side margins of said platform that when lowered, their lower ends will project laterally outward from said platform, but when raised, will be drawn within the side margins thereof, substantially as described.

7. The combination with a platform, of legs connected thereto, with freedom for vertical adjustment of either of said parts on the other, as a base of resistance, independent motors, one for each of said legs, and connections from
30 each of said motors to the cooperating leg, constructed to positively force the same in either of two opposite directions, at will, substantially as described.

In testimony whereof I affix my signature 35
in presence of two witnesses.

FREDERICK O. KILGORE.

Witnesses:

JAS. F. WILLIAMSON,

E. F. ELMORE.