

W. H. HUNT.
ELEVATING APPARATUS.
APPLICATION FILED SEPT. 6, 1910.

1,012,203.

Patented Dec. 19, 1911.

4 SHEETS—SHEET 2.

Fig. 3.

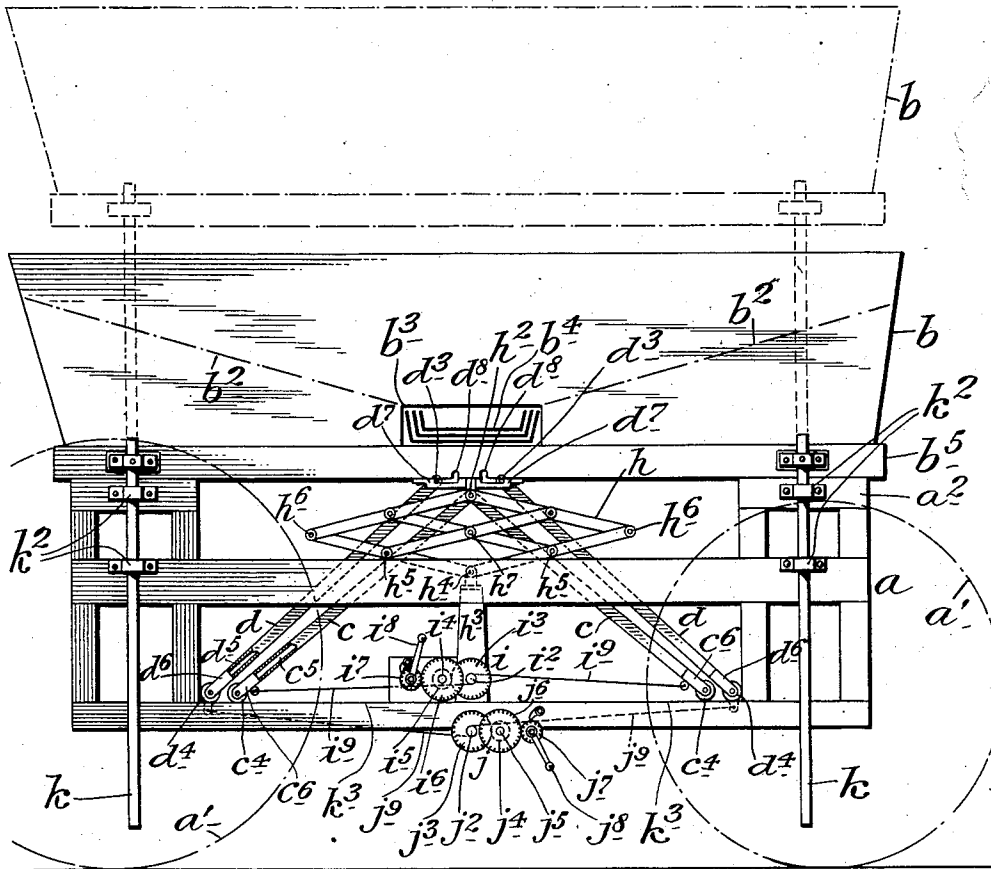


Fig. 3a



WITNESSES

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INVENTOR

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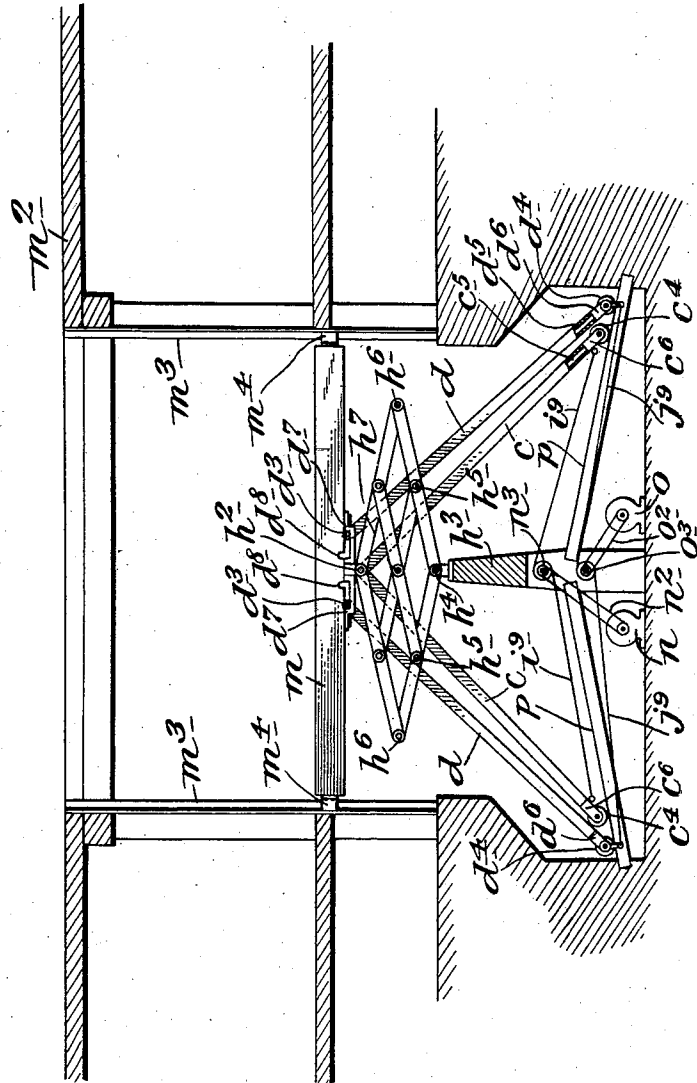
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Fig. 4.



WITNESSES

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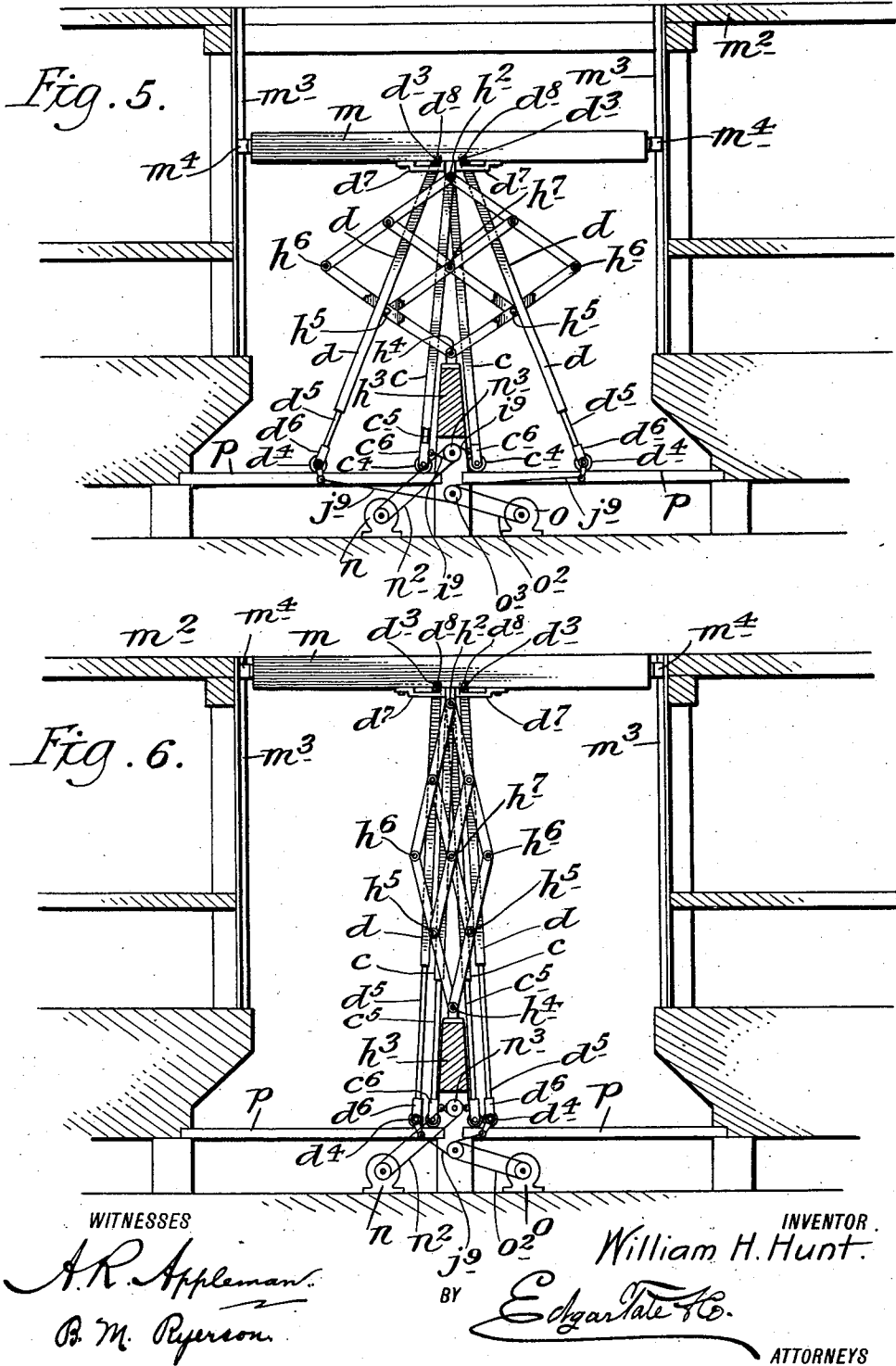
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4 SHEETS-SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM H. HUNT, OF NEW YORK, N. Y.

ELEVATING APPARATUS.

1,012,203.

Specification of Letters Patent.

Patented Dec. 19, 1911.

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To all whom it may concern:

Be it known that I, WILLIAM H. HUNT, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Elevating Apparatus, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to elevating or hoisting apparatus and the object thereof is to provide an improved apparatus of this class which is particularly designed for elevating the bodies of coal trucks or similar vehicles, in order that the contents of said bodies may be dumped or discharged from an elevated position; but which may also be used in connection with elevator cars or platforms especially in what are known as cellar or sidewalk elevators, and with this and other objects in view the invention consists in an elevator or elevator apparatus constructed as hereinafter described.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 is a side view showing my improved elevating apparatus applied to a coal truck; Fig. 2 a view similar to Fig. 1 but showing a modification; Fig. 2^a a perspective detail view of a part of the construction shown in Fig. 2; Fig. 3 a view similar to Figs. 1 and 2 but showing another modification; Fig. 3^a a plan view of a set of lazy tongs forming part of the construction shown in Fig. 3; Fig. 4 a view similar to Fig. 3 but showing my improvement applied for the purpose of raising an elevator car or platform such as the car or platform of a cellar or sidewalk elevator; Fig. 5 a view similar to Fig. 4 but showing the car or platform partly raised, and;—Fig. 6 a view similar to Figs. 4 and 5 but showing the car or platform fully raised.

In Fig. 1 of the accompanying drawing I have shown or indicated at *a* a part of the truck frame of a coal truck or similar vehicle, only enough of said truck frame being shown to indicate the construction and use of my improvement and the position of the wheels *a*¹ of the truck. The top portion of

the truck frame is shown at *a*² and the central part thereof is broken away and mounted thereon is the usual body *b* which may be of any desired construction, but the bottom of the end portions of which are preferably inclined downwardly toward the middle thereof as indicated by the dotted lines *b*² and at said middle thereof and in a side thereof is a side discharge opening *b*³ in which is shown a telescopic discharge chute *b*⁴. The opposite side portions of the truck frame are provided with inclined tracks *a*³ which extend downwardly from the central portion of the truck frame and in practice, and in the form of construction shown in Fig. 1, I employ in connection with the bottom of the opposite sides of the body *b* two sets of toggle levers *c* and *d*. The upper ends of the toggle levers *c* have a sliding connection with the bottom *b*⁵ of the body *b*, this connection consisting of oblong keepers *c*² which are secured to the bottom of the body *b*, and pins *c*³ are connected with said levers and movable in said keepers, while the lower ends of said levers *c* are provided with rollers *c*⁴ movable on the tracks *a*³. The upper ends of the toggle levers *d* also have a sliding connection with the bottom *b*⁵ of the body *b*, said connection being made by means of oblong keepers *d*² secured to the bottom of said body and pins *d*³ connected with said levers and movable in said keepers, while the lower ends of said levers *d* are provided with rollers *d*⁴ movable on the tracks *a*³. I also provide a suitable winding and cord or cable mechanism for operating the levers *c* and *d* and in the form of construction shown in Fig. 1, this mechanism consists of a shaft *e* mounted transversely in the truck frame, and cords or cables *e*² connected with the lower ends of the levers *c*, and with said shaft, and cords or cables *e*³ connected with the lower ends of the levers *d* and with said shaft, and the shaft *e* is also provided with a gear wheel *e*⁴ which meshes with a pinion *e*⁵ mounted on a supplemental shaft *e*⁶, said supplemental shaft *e*⁶ being provided with a gear wheel *e*⁷ and being operated by a pinion *e*⁸ supported adjacent thereto and the shaft of which is provided with a crank *e*⁹, the pinion *e*⁸ being also provided with a pawl *f* which prevents the backward movement thereof and of the other parts of the winding mechanism.

The operation of this form of construction

tion will be readily understood from the foregoing description when taken in connection with the following statement thereof. With the parts of the apparatus in the position shown in Fig. 1, and the body *b* resting on the truck *a* the levers *c* and *d* are in their lowermost and outermost positions, and when the shaft *e* is turned by means of the crank *e*¹ and intermediate gearing, the body *b* will be gradually raised into the position also shown in dotted lines in said figure, and with the parts of the elevating or hoisting apparatus in this position the body *b* will be raised through a distance equal or approximately equal to the depth thereof and the contents of said body may be discharged from the side thereof in the ordinary manner as will be readily understood.

In the accompanying drawing the cords or cables *e*² and *e*³ are connected directly with the lower ends of the levers *c* and *d*, but the method of making this connection is immaterial and said levers may be provided if desired, with rollers or pulleys around which said cords or cables may be passed, and while I have shown and described a particular form of winding mechanism it will be apparent that my invention is not limited thereto, nor is my invention limited to the sliding connection of the levers *c* and *d* with the bottom of the body *b*; and it will also be understood, that in practice, a suitable brake mechanism may be employed to control the downward movement of the body *b*, but as said brake mechanism forms no part of my invention, it is not shown and described.

With the construction shown in Fig. 1 the body *b* is raised vertically and the contents discharged from one side thereof, but in Fig. 2 I have shown a modification intended for use when it is discharged to raise one end of the body *b* higher than the other and to dump the contents from one end thereof. In this form of construction I preferably use only the levers *d*, and the connection of the upper ends of said levers with the bottom of the body *b* are made the same as in Fig. 1, but in connection with the keepers *d*² I provide means to prevent the said levers from sliding therein when desired. This means consists of bracket-shaped keepers *g* secured to the sides of the bottom of the body *b* and vertically movable lock pins *g*² adapted to be inserted into said keepers and provided with heads *g*³ and reduced end portions *g*⁴ forming shoulders *g*⁵, as clearly shown in Fig. 2^a.

The bracket-shaped keepers *g* are connected with the sides of the bottom *b*⁵ of the body *b* over the outer end portions of the keepers *d*² and when the pins *g*² are passed downwardly through said bracket-shaped keepers the reduced end portions *g*⁴

thereof operate in connection with the pins *d*³ in the ends of the levers *d* to prevent said ends from moving in the keepers *d*². In this form of construction the winding mechanism consists of the shafts *e* and *e*⁶ and gearing *e*⁴, *e*⁵ and *e*⁷ and employed in connection with the gear wheel *e*⁷ is a crank pinion *f*², while a sliding pinion *f*³ is mounted on a shaft *f*⁴ opposite the crank pinion *f*² and also adapted to engage the gear wheel *e*⁷, said sliding pinion *f*³ being adapted to be moved longitudinally of its shaft by a lever *f*⁵. In this form of construction the cords or cables *e*³ connected with the front levers *d* are also connected with the shaft *e*, but the cords or cables *e*³ connected with the rear levers *d* are connected with the shaft *f*⁴. Normally the pinion *f*³ is not in mesh with the wheel *e*⁷ and when it is desired to raise the body *b*, the crank pinion *f*² is operated and the front levers *d* are drawn into the position shown in dotted lines and the front end of the body *b* is raised into the position also shown in dotted lines. It will be understood that the contents of the body may be dumped when said body is in this position, but if it be desired to raise the said body and dump it from a higher position the crank pinion *f*² may be operated so as to partially raise the front end of the body after which the pinion *f*³ may be thrown into engagement with the gear *e*⁷, and by continuing to operate the crank pinion *f*² both ends of the body will be raised, and after the dumping or rear end of the body has been raised to the desired extent the pinion *f*³ may be disengaged from the gear *e*⁷, and the crank pinion *f*² further operated so as to raise the front end of the body to the desired angle, all this operation as will be understood, being rendered possible by the particular form of the winding gear mechanism.

In order to raise the body *b* as above described and as shown in Fig. 2 the upper ends of the front levers *d* must be locked in their outermost position in the keepers *d*², this operation being performed by means of the pins *g*² and bracket-shaped keepers *g* as shown in said figure, while the upper ends of the rear levers *d* must be left free to slide in their keepers *d*²; but it will be understood that by locking the upper ends of both the front and rear levers *d* in either the outer ends or inner ends of the keepers *d*², the body *b* may be raised vertically and horizontally as shown in Fig. 1.

With the construction shown in Fig. 2 I connect with the bottom rear end of the body *b* a pin *f*⁵ which passes down through the top of the truck frame and prevents the body *b* from sliding backwardly when the front end thereof is raised and before the rear levers *d* are brought into operation, and while I have not shown and described

a brake mechanism for controlling the descent or fall of the body *b* as is customary with apparatus of this class it will be understood that any suitable brake mechanism may be employed if desired or the descent or fall of the body *b* may be controlled by the crank or crank pinion *f*².

In Fig. 3 I have shown another modification of the construction shown in Figs. 1 and 2 for raising the body or bed of a coal truck or similar vehicle vertically, and in this form of construction the separate sets of toggle levers *c* and *d* are employed at the opposite sides of the truck frame, and in connection with the opposite sides of the body or bed *b*, and said body or bed *b* is of the same form as shown in Fig. 1. In this form of construction I also employ at the opposite sides of the truck frame and in connection with the opposite sides of the bed or body *b*, a set of lazy tongs *h*, the central top portions of which are pivoted to the central part of the body of the truck at *h*², and the central bottom portions of which are pivoted to a support *h*³ at *h*⁴.

The lazy tongs *h* are arranged horizontally and are what are known as double lazy tongs as shown in Fig. 3^a, and the separate side members thereof are connected at the top and bottom as at *h*² and *h*⁴, and at the bottom and midway of the end portions thereof as at *h*⁵, and at the ends *h*⁶ thereof, and centrally thereof as at *h*⁷, and the connections of the separate side portions of said lazy tongs at *h*⁵, are provided with antifriction rollers. The toggle levers *c* and *d* which are arranged in pairs at the opposite sides of the truck and of the bed or body *b* in this form of construction, are composed of separate telescopic members, the lower end portions *c*⁵ and *d*⁵ thereof being telescopic in the upper end portions thereof and being provided with heads *c*⁶ and *d*⁶ in which the rollers *c*⁴ and *d*⁴ are mounted. In this form of construction the upper end portions of the toggle levers *c* are pivoted at *h*² where the top portions of the lazy tongs *h* are also pivoted, while the upper end portions of the toggle levers *d* are pivoted in oblong keepers *d*⁷, secured to the opposite sides of the bottom of the bed or body *b*, the pins *d*³ with which said levers are provided being movable in said keepers, and at the inner ends of said keepers, the sides of the bottom of the bed or body *b* is provided with recesses *d*⁸ adapted to receive the pins *d*³, and the object of which is to hold the levers *c* and *e* against accidental movement when said pins rest therein. With this form of construction the levers *d* pass between the separate side portions of the lazy tongs *h* between the pivotal connections at *h*⁵ and *h*⁶, while the levers *c* pass between the separate side portions of said lazy tongs, and between the

pivotal connection at *h*⁴ and *h*⁵ thereof. I also provide separate winding mechanisms *i* and *j* for the toggle levers *c* and *d*, in the form of construction shown, in Fig. 3, and the winding mechanism *i* consists of a central transverse shaft *i*² provided with a gear *i*³, a supplemental shaft *i*⁴ provided with a pinion *i*⁵ which meshes with the gear *i*³, and with a gear *i*⁶ and mounted adjacent to the gear *i*³ and meshing therewith is a pinion *i*⁷ provided with a crank *i*⁸, and connected with the shaft *i*² and the lower end portions of the toggle levers *c* are cords or cables *i*⁹.

The winding mechanism *j* consists of a shaft *j*² provided with a gear *j*³ which meshes with a pinion *j*⁴ on a supplemental shaft *j*⁵, and said shaft *j*⁵ is provided with a gear *j*⁶, and a crank pinion *j*⁷ is mounted adjacent to the gear *j*⁶ and provided with a crank *j*⁸, and cords or cables *j*⁹ are connected with the lower ends of the toggle levers *d* and with the shaft *j*². The body *b* is also provided at its opposite ends and on the opposite sides thereof with depending guide bars *k* which are movable in vertical keepers *k*² secured to the sides of the truck frame, and the lower ends of the toggle levers *c* and *d* in this form of construction move on horizontal tracks *k*³, but this last feature is not essential and the tracks *k*³ may be inclined the same as the tracks *a*³ shown in Figs. 1 and 2 if desired.

In order to understand the operation of the construction shown in Fig. 3 it will be necessary to consider the construction shown in Figs. 4, 5 and 6, in which the same hoisting or elevating apparatus is used for raising the car or platform of a cellar or sidewalk elevator. In Figs. 4 to 6 inclusive I have shown a cellar or sidewalk elevator car or platform *m* mounted in a shaft which extends from the bottom of a cellar or street vault to the surface of a pavement at *m*², and said shaft is provided at its opposite sides with vertical guides *m*³, and the car or platform with keepers *m*⁴ movable on said guides. The apparatus or means for elevating the car or platform *m* is exactly the same as that for elevating the truck body *b* in Fig. 3, with the exception of the winding mechanism which consists of a motor *n* with the shaft of which is connected a belt or cable *n*², which is connected with a drum or similar device *n*³, with which the cords or cables *i*⁹ which operate the toggle levers *c* are connected, and another motor *o*, the shaft of which is provided with a belt or cable *o*² which is connected with a drum or similar device *o*³, with which the cords or cables *j*⁹, which operate the toggle levers *d* are connected; but my invention is not limited to the form of winding mechanism or apparatus shown in Fig. 3 or to that shown in Figs. 4, 5 and 6 and any suitable winding mechanism by which the

toggle levers *c* and *d* can be operated as hereinafter described may be employed.

In order to operate the hoisting or elevating apparatus shown in Figs. 3 and 4 the winding mechanism *i* shown in Fig. 3 or the motor *n* shown in Fig. 5, is first operated so as to draw the toggle levers *c* into the position shown in Fig. 5. The winding mechanism *j* shown in Fig. 3 or the motor *o* shown in Figs. 4, 5 and 6 is then operated so as to operate the toggle levers *d* and draw them into the position shown in Fig. 6. In this last operation the upper end portions of the toggle levers *d*, after the hoisting apparatus assumes the position shown in Fig. 5, press on the pivotal connections at *h*⁵ of the separate parts of lazy tongs *h* at each side and force said lazy tongs into the position shown in Fig. 6, and this completes the elevation of the body of the truck shown in Fig. 3 or of the car or platform *m* shown in Figs. 4 to 6 inclusive. In this operation the telescopic members *c*⁵ and *d*⁵ of the toggle levers *c* and *d* assume the position shown in Figs. 3 and 4, and that shown in Figs. 5 and 6, the first change of position being that shown in Fig. 5, and the last change that shown in Fig. 6.

It will be understood that suitable means may be employed for controlling the fall or downward movement of the car or platform *m* shown in Figs. 4 to 6 inclusive, as in the case of the bed or body *b* shown in Figs. 1 to 3 inclusive, and this means may be the winding mechanism, or suitable brakes as in connection with other apparatus of this class. It will also be understood that the tracks *p* on which the toggle levers *c* and *d* operate as shown in Figs. 4 to 6 inclusive, may be inclined as shown in Fig. 4 or may be horizontal, as shown in Figs. 3, 5 and 6, or all of said tracks or ways may be inclined, if desired, and by my improvement I provide means whereby truck beds or bodies, loaded to the extent of several tons may be easily raised for dumping purposes into any desired position, and whereby an elevator car or platform of the class specified when heavily loaded may also be quickly, easily and conveniently raised to the desired height with the least possible application of power. While in Figs. 3 to 6 inclusive of the accompanying drawing I have shown two different winders or winding mechanisms for the toggle levers *c* and *d*, my invention is not limited to this construction, and other forms of mechanism of this class may be provided and various changes in and modifications of the other features of the construction shown and described herein may be made without departing from the spirit of my invention or sacrificing its advantages. It will also be seen that in the form of construction shown in Figs. 3 to 6 inclusive the toggle levers *c* are employed to give

the load an upward movement after which the toggle levers *d* operate in connection with the lazy tongs *h* to finish said movement, and a lazy tongs construction may be employed in connection with the toggle lever apparatus shown in Fig. 1 if desired.

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

1. A load hoisting mechanism consisting of a plurality of levers arranged in pairs transversely of and beneath the load, one end of said levers having a sliding connection with the bottom of said load and being provided with means whereby they may be locked in a predetermined point in the said sliding connection, the other ends of each pair of said levers being normally extended in opposite directions and on the opposite sides of a central point beneath said load, tracks or ways beneath said load and on which said other ends of said levers bear, and means, independent of the load for drawing the extended ends of said levers inwardly toward said central point beneath said load.

2. A load hoisting mechanism consisting of a plurality of levers arranged in pairs transversely of and beneath said load, one end of said levers having a sliding connection with said load and the other ends of said pairs of levers being extended in opposite directions beneath said load, tracks or ways beneath said load and on which said other ends of said levers bear, and a set of lazy tongs in connection with which said levers operate, one pair of said levers serving to give the load an initial upward movement and the other pair operating in connection with said lazy tongs to finish said movement.

3. A load hoisting mechanism, consisting of a plurality of levers, arranged in pairs transversely of and beneath said load, the upper ends of said levers being connected with said load, tracks or ways beneath said load and on which the other ends of said levers bear, and a set of lazy tongs also employed in connection with and beneath each side of the load, and in connection with which said levers operate, one pair of said levers serving to give the load an initial upward movement and the other pair operating in connection with said lazy tongs to finish said movement, said levers being also composed of separate telescopic parts.

4. A load hoisting mechanism, consisting of a plurality of levers arranged in pairs transversely of the bottom of the load, and connected at one end with said load, tracks or ways arranged beneath said load and inclined downwardly and outwardly from a central point and on which the other ends of said levers bear, the ends of the separate pairs of levers which bear on said tracks or ways being normally extended in opposite

directions on the opposite sides of said central point, and a winding mechanism independent of the load and connected with the extended ends of said levers and adapted to draw them inwardly and toward said central point.

In testimony that I claim the foregoing as

my invention I have signed my name in presence of the subscribing witnesses this 31st day of August 1910.

WILLIAM H. HUNT.

Witnesses:

C. E. MULREANY,

B. M. RYERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
