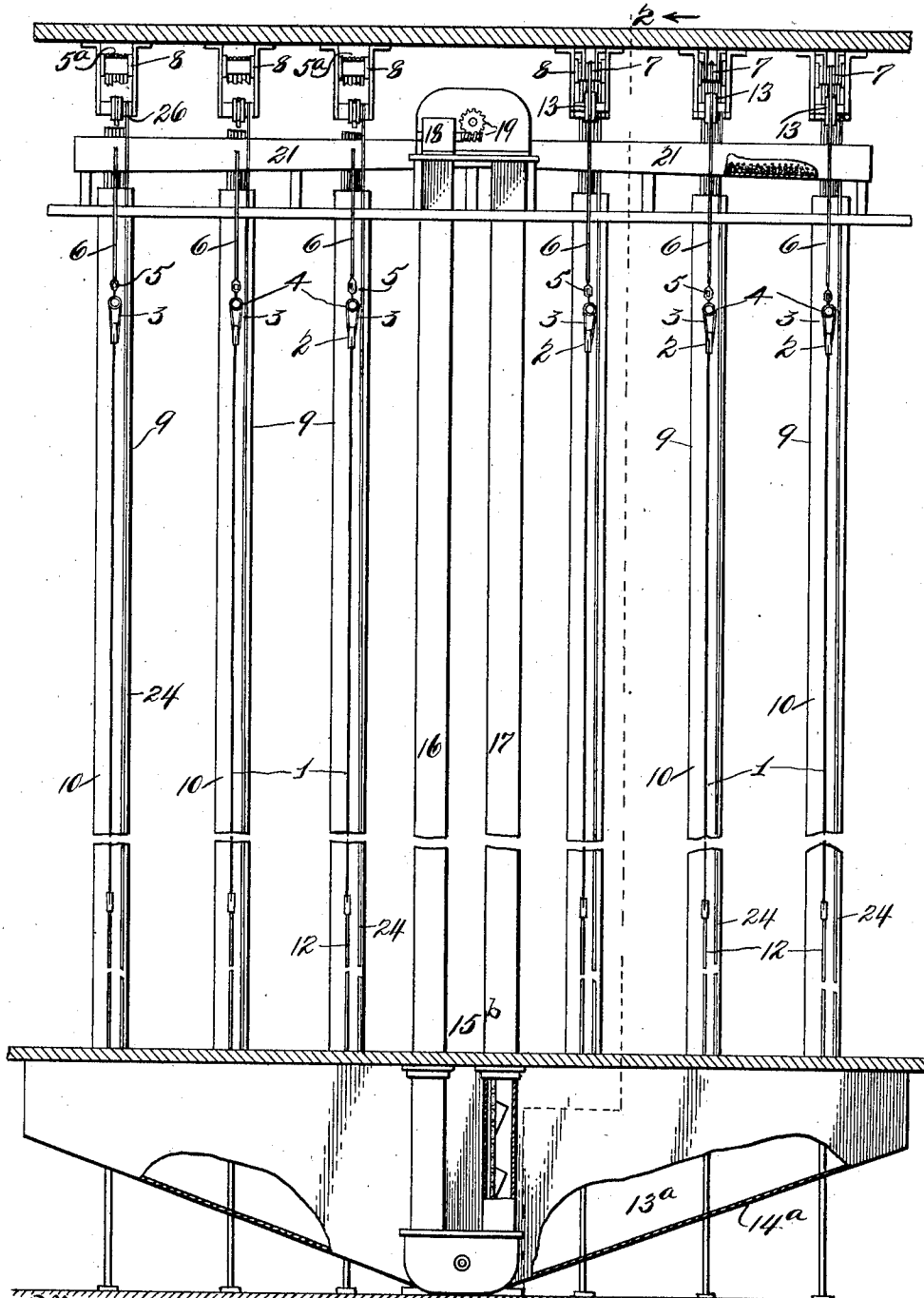


C. L. HAGEN.
ELEVATING AND LOWERING DEVICE FOR STAGE SCENERY.
APPLICATION FILED MAR. 26, 1910.

1,002,839.

Patented Sept. 12, 1911.

3 SHEETS—SHEET 1.



Witnesses:
C. A. Jarvis,
Benjamin H. H. H. H.

Fig. 1.

Inventor
C. L. Hagen
By his Attorney
Warrum Wright

C. L. HAGEN.
ELEVATING AND LOWERING DEVICE FOR STAGE SCENERY.
APPLICATION FILED MAR. 26, 1910.

1,002,839.

Patented Sept. 12, 1911.

3 SHEETS-SHEET 2.

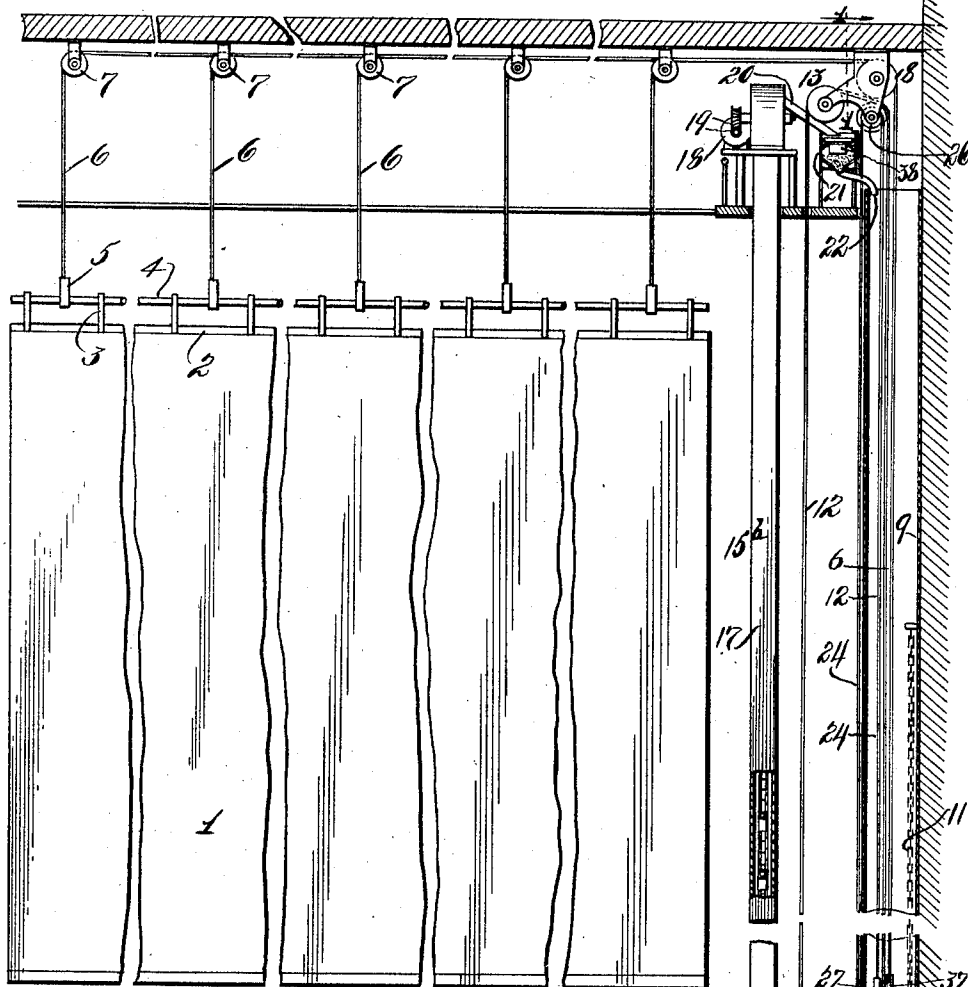


Fig. 2.

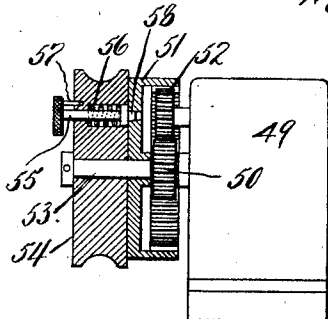


Fig. 9.

Witnesses:
C. A. Jarvis.
Benjamin Munking.

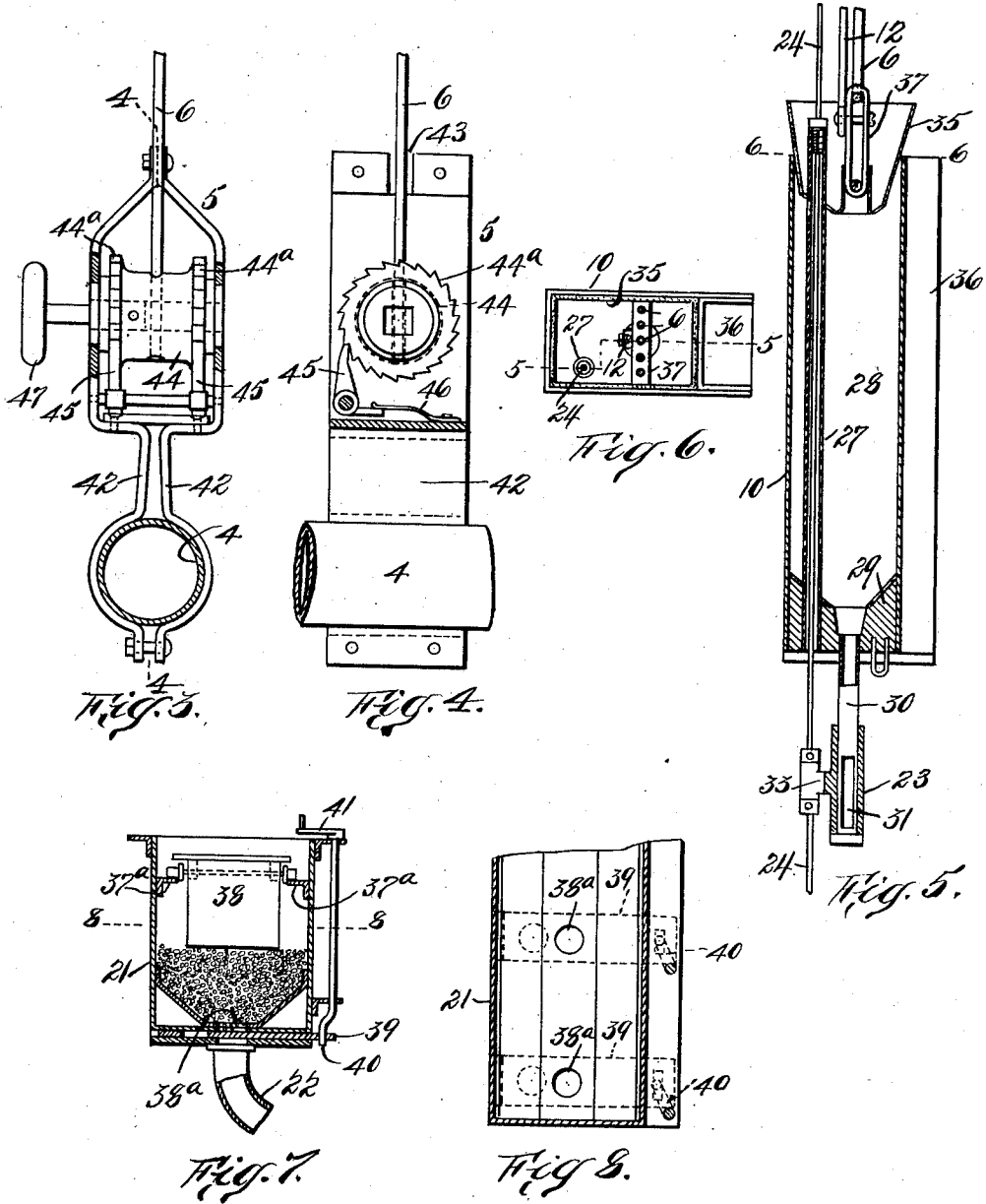
Inventor
Claude L. Hagen
By Attorney
F. Warren Wright

C. L. HAGEN.
ELEVATING AND LOWERING DEVICE FOR STAGE SCENERY.
APPLICATION FILED MAR. 26, 1910.

1,002,839.

Patented Sept. 12, 1911.

3 SHEETS-SHEET 3.



Witnesses:
C. A. Jarvis.
Benjamin M. Hensley.

C. L. Hagen Inventor
By his Attorney
A. Warren Wright

UNITED STATES PATENT OFFICE.

CLAUDE L. HAGEN, OF NEW YORK, N. Y.

ELEVATING AND LOWERING DEVICE FOR STAGE-SCENERY.

1,002,839.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed March 26, 1910. Serial No. 551,617.

To all whom it may concern:

Be it known that I, CLAUDE L. HAGEN, a citizen of the United States, residing at New York city, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Elevating and Lowering Devices for Stage-Scenery, of which the following is a clear, full, and exact description.

10 This invention relates to mechanism adapted to permit the handling of stage scenery with the use of little labor, and to readily permit the lowering of all scenery in a short space of time, in case of fire or
15 other accident, when it is desired that the scenery should be lowered; for instance to the stage floor, that fire fighters may get at the same effectively.

In the theatrical profession, the handling
20 of the scenery, which is often very heavy, requires the services of strong and sometimes a number of men to raise and lower the same, even when counterweighted to the best of the ability of the stage manager, for
25 besides the weight, the operators must overcome the friction over the sheaves. In the present invention, I secure this result by securing to each piece of scenery a counterweight, consisting of an open bucket, containing a flowing weight, preferably shot.
30 I provide means for readily filling such bucket to overcome the friction on the sheaves, and the weight of the scenery, if desired to raise the same, or to counter-
35 balance it to a nicety to enable the operator with little expenditure of energy to operate the same. If it is desired to lower the scenery, I provide a valve which allows the shot to run out of the bucket when the
40 weight of the scenery will cause the same to gradually approach the stage either by its own weight or aided by the stage hand with little expenditure of energy.

To provide the apparatus with means to
45 permit its operation as may be desired, I provide a conveyer system for elevating shot from a receiving well or hopper in the cellar, to the roof of the theater, where it is distributed in a trough, having pipes lead-
50 ing in line with each of the buckets, each bucket traveling vertically in a shaft or tube. The shaft or tube leads to a well or hopper preferably in the cellar of the theater, from which the shot is elevated by the

conveyer, heretofore described. Haul ropes 55 are fastened to the bucket to allow one to manually shift the bucket in the shaft or tube, and thus move the scenery. Trap ropes are provided to permit the exit of the shot from the buckets, that the scenery may
60 descend by its own weight. Each bucket preferably has a number of ropes or cables leading thereto, which pass over sheaves arranged transverse to the stage, and are secured to a scene hanger provided with suitable
65 clutches for engaging the batten thereof. In order that the shot may be distributed in line with the various tubes or shafts, the trough may be provided with a distributing conveyer, to convey the shot to one
70 end or the other of the trough. Each pipe or tube from the trough leads to an individual tube or shaft and is provided with a hand valve for manual control from a gallery to allow the shot to enter the buckets
75 at will, or semi-automatic means for the operation of such valve may be provided. As the various ropes to the various positions on the scene hanger lead to an individual bucket, and it is necessary to have the scene
80 hanger at all times level, I provide a new and improved equalizer for taking up slack in the different ropes or cables.

Various other details of improved construction will be referred to in the specification.

The scope of my invention will be pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view partly in section, showing
90 my device as it appears against one of the side walls of the theater. Fig. 2 is a view partly broken away and partly in section, the main section being taken on line 2—2, Fig. 1. Fig. 3 is a detail of one of the
95 equalizers for taking up the slack in the rope or cable, showing a side view thereof, with parts broken away. Fig. 4 is a view at right angles to Fig. 3 on line 4—4 of such figure. Fig. 5 is a transverse sectional side
100 elevation of one of my improved buckets taken on line 5—5, Fig. 6. Fig. 6 is a sectional view on line 6—6, Fig. 5. Fig. 7 is a transverse sectional view enlarged of the supply trough, taken through the center of
105 one of the valves. Fig. 8 is a sectional plan view taken on line 8—8, Fig. 7 of a portion of the supply trough. Fig. 9 is a detail

partly in section, of the motor drive for the haul ropes.

As shown in the drawings, 1 is a piece of scenery known as a drop, generally provided with a batten at the top, shown by the line at 2, Fig. 1. A series of clamps 3 engage the batten, and they are mounted on a transverse pipe or bar 4. At various distances along this bar there are secured equalizers or cable take-ups 5, which will be described more in detail hereinafter. The cables or ropes 6 pass over sheaves 7, each of which is secured to a beam, near the roof of the theater. The collection of ropes shown in Fig. 1 at 5^a pass over a large sheave or drum 8, down through a tube or shaft 9, and are attached to a link secured to a bucket 10. A chain 11 secured to the side wall and secured at its other end to the bottom of the bucket, is provided to act as a counterbalance for the cables 6, after they pass over the sheave 8. A haul rope 12, passing over a sheave 13 near the top of the theater, is attached to the top of the bucket. The lower end of the haul rope passes over a sheave 14, which is mounted on a rod 15, and adapted to be clamped thereon in an adjustable position; from the sheave 14 the haul rope passes over a sheave 15^a, and is secured to the bottom of the bucket, so that upon pulling upon the haul rope the bucket can be raised and lowered and the drop also lowered and raised. Each one of the scene hangers, it will be obvious, may be supplied with its individual tube or shaft 9, and with its individual bucket 10. The shaft or tube 9 is open at its top and at its bottom. At its bottom it leads to a hopper or receptacle 13^a, preferably having inclined bottom 14^a, which delivers the shot, mercury or other material into a well adjacent to an elevator 15^b. The elevator may be of the ordinary bucket type, having two legs 16 and 17, composed of closed shafts or tubes, and may be driven by an electric motor 18 through worm gears 19, delivering the shot at its upper end through a tube 20, to a trough 21, shown in detail in Figs. 7 and 8, and which will be further described. The trough has a number of pipes 22, leading therefrom, one to the top of each of the shafts or tubes 9, and controlled by a suitable valve, so that the shot may be dropped into the bucket, and retained therein, causing the same to balance the drop. The bucket is provided with a trap 23 at its bottom, which is operated through a trap rope 24, passing over a sheave 25 in the cellar and over a sheave 26 near the roof, also passing freely through a tube 27 in the bucket so as not to be interfered with by the shot therein. The function of the trap rope 24 is to open the trap when it is manipulated by the operator, to let the shot out of the bucket. This will permit the scene to descend due to its own weight.

In view of the perfect balance secured it is unnecessary to secure the haul rope or other parts.

The bucket is shown in detail in Figs. 5 and 6. It is composed of a chamber 28, through which the tube 27 passes for the trap rope 24, and with a solid bottom 29 open to a tube 30, provided with a slot 31. Surrounding the slot 31 is the tube 23 integral with a clamp bracket 33 secured to the trap rope 24. I prefer to provide the bucket at its upper part with a funnel of leather or other material 35 to direct and cushion the shot as it falls through the tube or shaft into the chamber 28. I also prefer to provide a channel 36 at one side of the bucket, which will permit overflow to the hopper 13^a in the cellar should more shot be fed to the bucket than it will hold. The channel 36 also permits freedom of motion for the counterbalance chain 11 heretofore described. The various drop cables or ropes 6 are preferably secured to a link 37 of the bucket, where they may be made fast in any of the usual ways known to mechanics.

The supply hopper 21 for the tubes 9 is made in the form of an ordinary trough and is preferably provided with rails 37^a, across which a distributing carriage 38 may be pushed by hand or mechanically. The same is made with a flat bottom as shown in the drawings, which is sometimes necessary due to lack of overhead room. It is understood that such distributor will not be necessary in equipments where the shot will feed by gravity. Above each tube or shaft there is provided in the trough an opening 38^a, which is normally closed by a slide valve 39, operated by a crank 40, rotated by a crank arm 41. While I have shown a manually operated crank arm for operating this valve 39, it will be obvious that other means may be employed.

The drop cable or rope 6, as I have before stated, is secured to an equalizer 5. This is shown in detail in Figs. 3 and 4. It comprises a pair of metal arms 42 clamped around the tube 4, and cut out to guide the cable 6 at its upper end as illustrated at 43, Fig. 4. A drum 44 is pivotally mounted in the arms 42, and to this drum the cable is permanently secured. At each side of the drum, preferably, I secure ratchet wheels 44^a engaged by ratchets 45 under the tension of springs 46. A key 47 is provided to rotate the drum to equalize the length of each of the cables 6, one with reference to the other, while the ratchets hold them in their adjusted positions.

As shown in Figs. 2 and 9 the haul rope 12 may be operated through an electric motor 49, which normally drives a pulley 54 loosely mounted on the motor shaft through pinions 50 and 52, and an internal gear 51. The gear 51 is normally locked to

the pulley 54 by a latch 58, provided with a spring 56. In this condition the haul rope is driven by its friction on the pulley around which it is passed, and in the case of trouble, such as fouling interference or entanglement, slip is allowed to prevent accident. If the haul rope is to be hand-controlled the latch pin 55 is withdrawn, rotated to cause the pin 57 to lie out of its recess, and leave the pulley free for rotation.

While I have for convenience termed the part 23 a trap, its function is that of a valve, it being obvious that any proper valve mechanism may be used.

In carrying out this invention, details of construction may be varied from those shown, and yet the essence of the invention be retained; some parts might be employed without others, and new features thereof might be combined with elements old in the art in diverse ways, although the herein described type is regarded as embodying substantial improvements over such modifications.

As many changes could be made in the above construction, and many apparently widely different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted in an illustrative and not in a limiting sense. It is furthermore desired to be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

I claim as my invention:

1. The combination of mechanism for holding a load to be elevated, cables secured thereto, sheaves over which said cables pass, a bucket to which said cables are secured, means for flowing weight into said bucket to balance the load, an individual guiding tube for the bucket and the weight.

2. The combination of mechanism for holding a load to be elevated, cables secured thereto, sheaves over which said cables pass, a bucket to which said cables are secured, means for flowing weight into said bucket to balance the load, means for opening said bucket to cause said weight to flow out at will, an individual guiding tube for the bucket and the weight.

3. The combination of mechanism for holding a load to be elevated, cables secured thereto, sheaves over which said cables pass, a bucket to which said cables are secured, means for flowing weight into said bucket to balance the load, a collector for the weight and a distributing means for the weight, and a conveyer means for raising the

weights from one to the other, an individual guiding tube for the bucket and the weight.

4. In combination with a plurality of scene drops, or the like, at least one hoisting cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough.

5. In combination with a plurality of scene drops, or the like, at least one hoisting cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for admitting the weights from said trough to any individual shaft.

6. In combination with a plurality of scene drops or the like, at least one hoisting cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for opening said bucket to deliver its contents to the hopper.

7. In combination with a plurality of scene drops or the like, at least one hoisting cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for discharging the contents of said bucket into the hopper, comprising a trap rope and valve, to which it is connected.

8. In combination with a plurality of scene drops, or the like, at least one hoisting cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, a haul rope secured to the bucket at each end, forming a continuous loop.

9. In combination with a plurality of scene drops or the like, at least one hoisting

cable for each drop, a bucket secured to the hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for admitting the weights from said trough to any shaft, a haul rope secured to the bucket at each end, forming a continuous loop.

10. In combination with a plurality of scene drops, or the like, at least one hoisting cable for each drop, a bucket secured to the tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for opening said bucket to deliver its contents to the hopper, a haul rope secured to the bucket at each end, forming a continuous loop.

11. In combination with a plurality of scene drops or the like, at least one hoisting cable for each drop, a plurality of tubes or guide shafts one for each bucket, a receiving hopper at the lower end of said shafts, a distributing trough above said shafts, and conveying and distributing means for circulating mobile weights from the receiving hopper to the distributing trough, means for discharging the contents of said bucket into the hopper, comprising a trap rope and valve, to which it is connected, a haul rope secured to the bucket, at each end, forming a continuous loop, and a motor to drive said haul rope.

12. In combination with a scene raising and lowering device, a bucket having a chamber, a funnel mouth, means for securing cables thereto, a trap or valve at the lower part of said bucket, a trap operating device therefor, a trap rope secured to said

device, passing through the bucket, a tube within the bucket, through which said trap rope passes.

13. In combination with a scene raising and lowering device, a bucket having a chamber, means for securing cables thereto, a trap or valve at the lower part of said bucket, a trap operating device therefor, a trap rope secured to said device, passing through the bucket, a tube within the bucket, through which said rope passes, said trap comprising a tube having openings therein, said drop operating device comprising a sliding sleeve, adapted to be reciprocated over said tube.

14. In combination with a trap raising and lowering device, a shaft or tube, a bucket therein, means for securing cables thereto, a trap or valve at the lower part of said bucket, a trap operating device therefor, a trap rope secured to said device passing through the bucket, an overflow channel for the bucket.

15. In a device for raising and lowering a load, a hoisting cable, a bucket therefor, said bucket being open at the top, a tube therefor, said bucket so fitting the tube that a space adapted to permit an overflow will be formed between the bucket and the tube, a trap valve and means for opening the same.

16. The combination of mechanism for holding scenery, cables secured thereto, sheaves over which said cables pass, a bucket to which said cables are secured, means for flowing weight into said bucket to balance the same, a motor, a pulley therefor, a haul rope fast at each end to the bucket and driven from said pulley, and means for disconnecting said pulley from its motor that it may rotate freely.

Signed at New York city this 24th day of March 1910.

CLAUDE L. HAGEN.

Witnesses:

F. WARREN WRIGHT,
MABEL DITTENHOEFER.