

No. 658,330.

Patented Sept. 18, 1900.

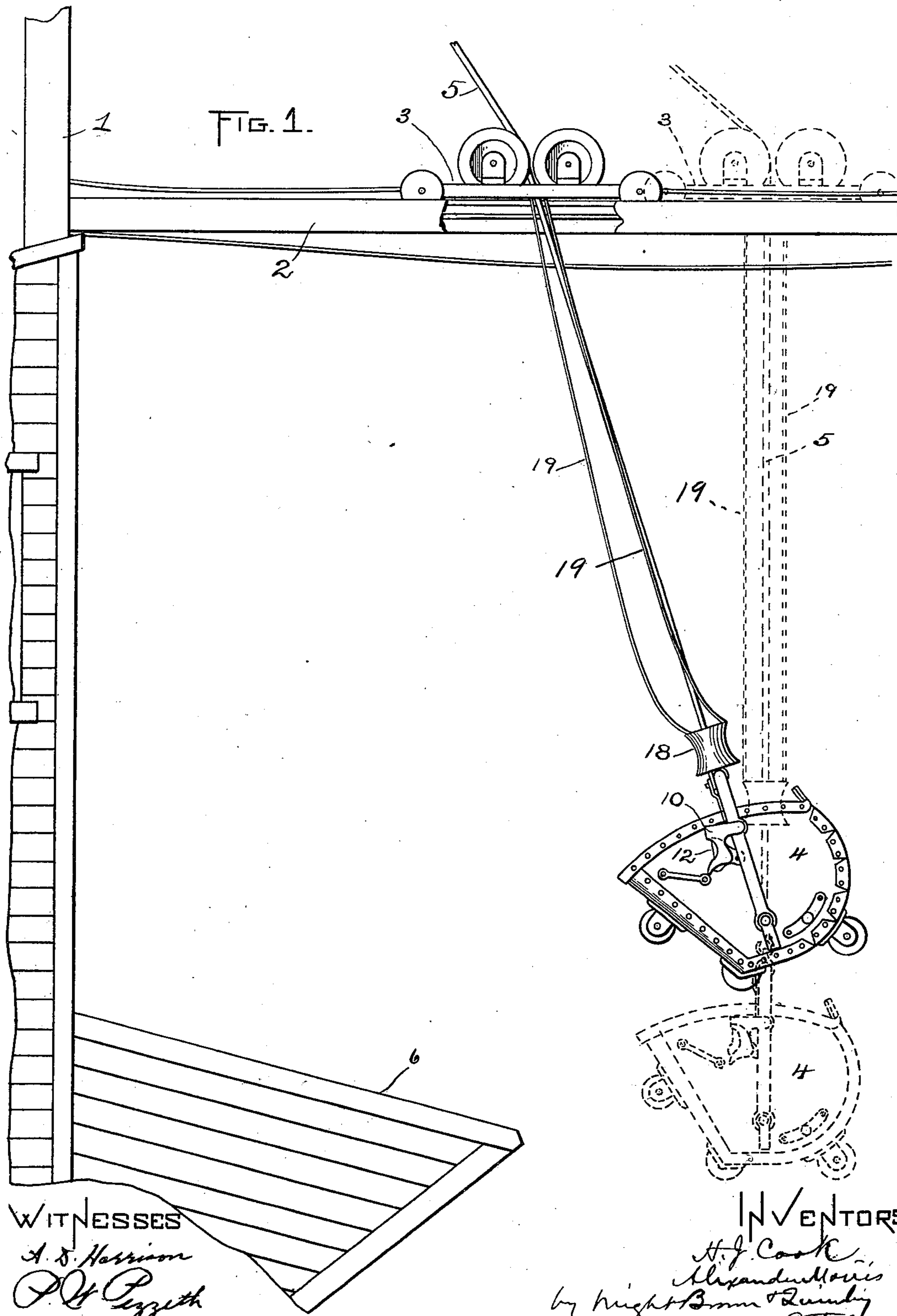
H. J. COOK & A. MORRIS.

HOISTING APPARATUS.

(Application filed June 4, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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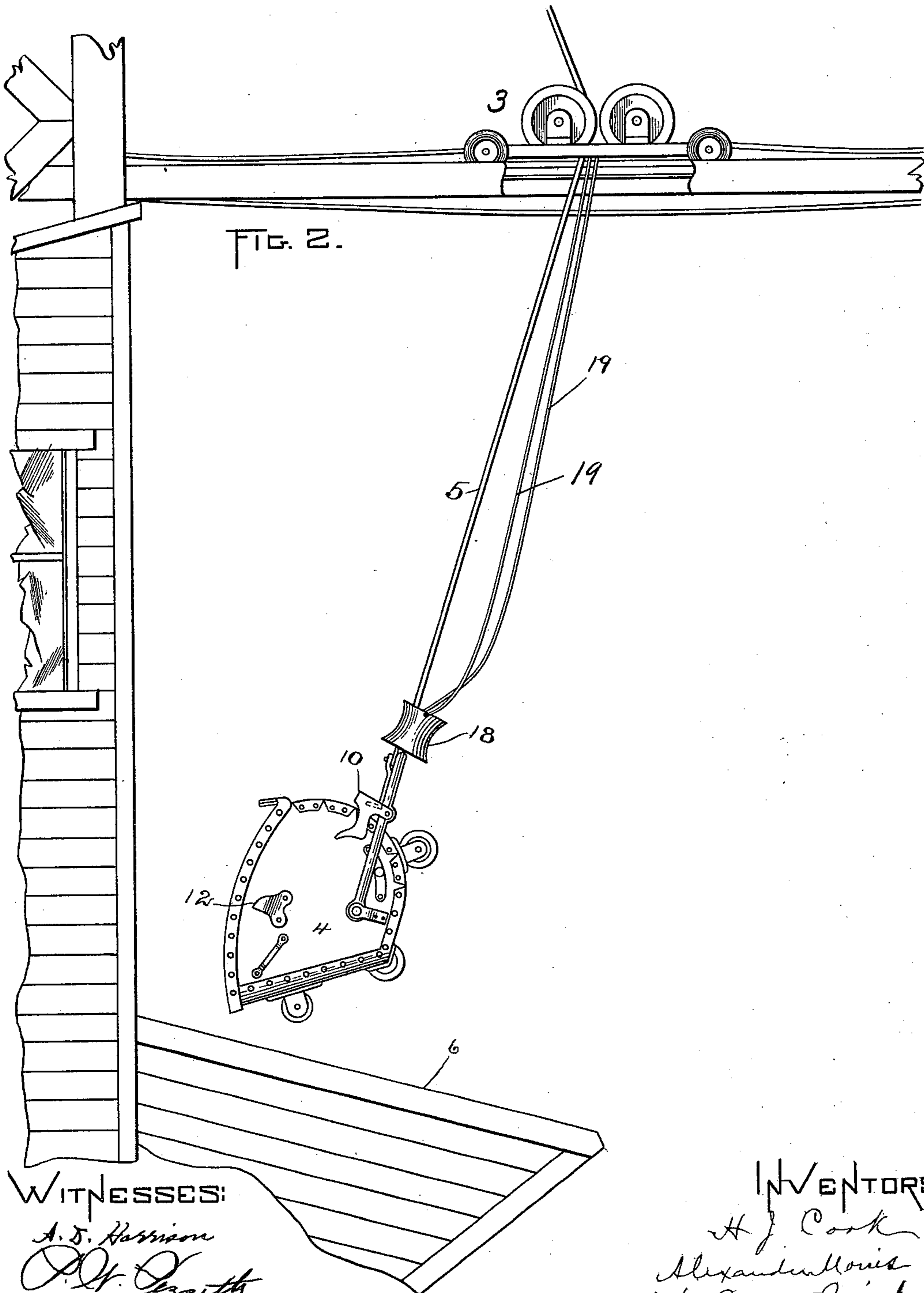
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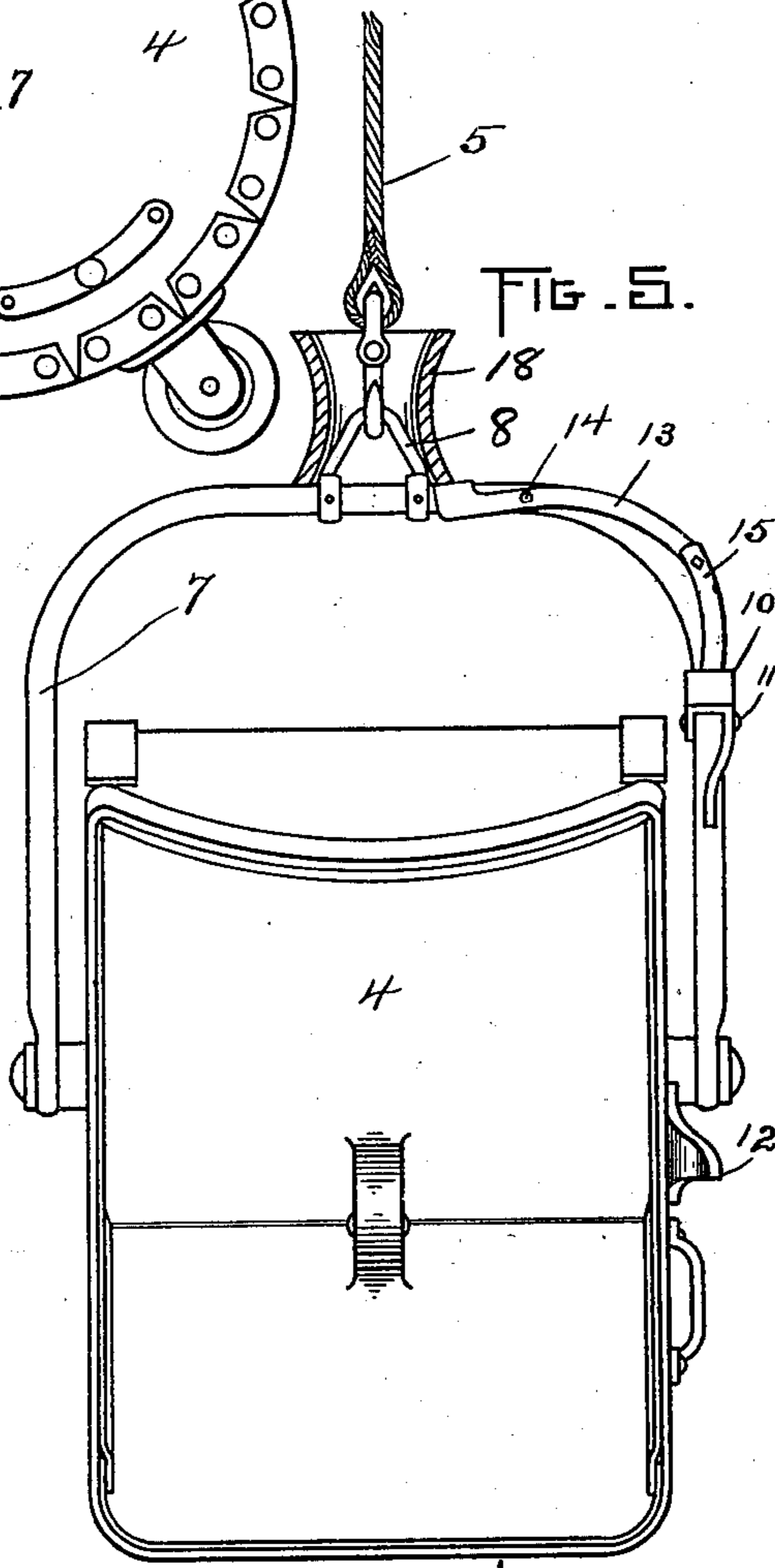
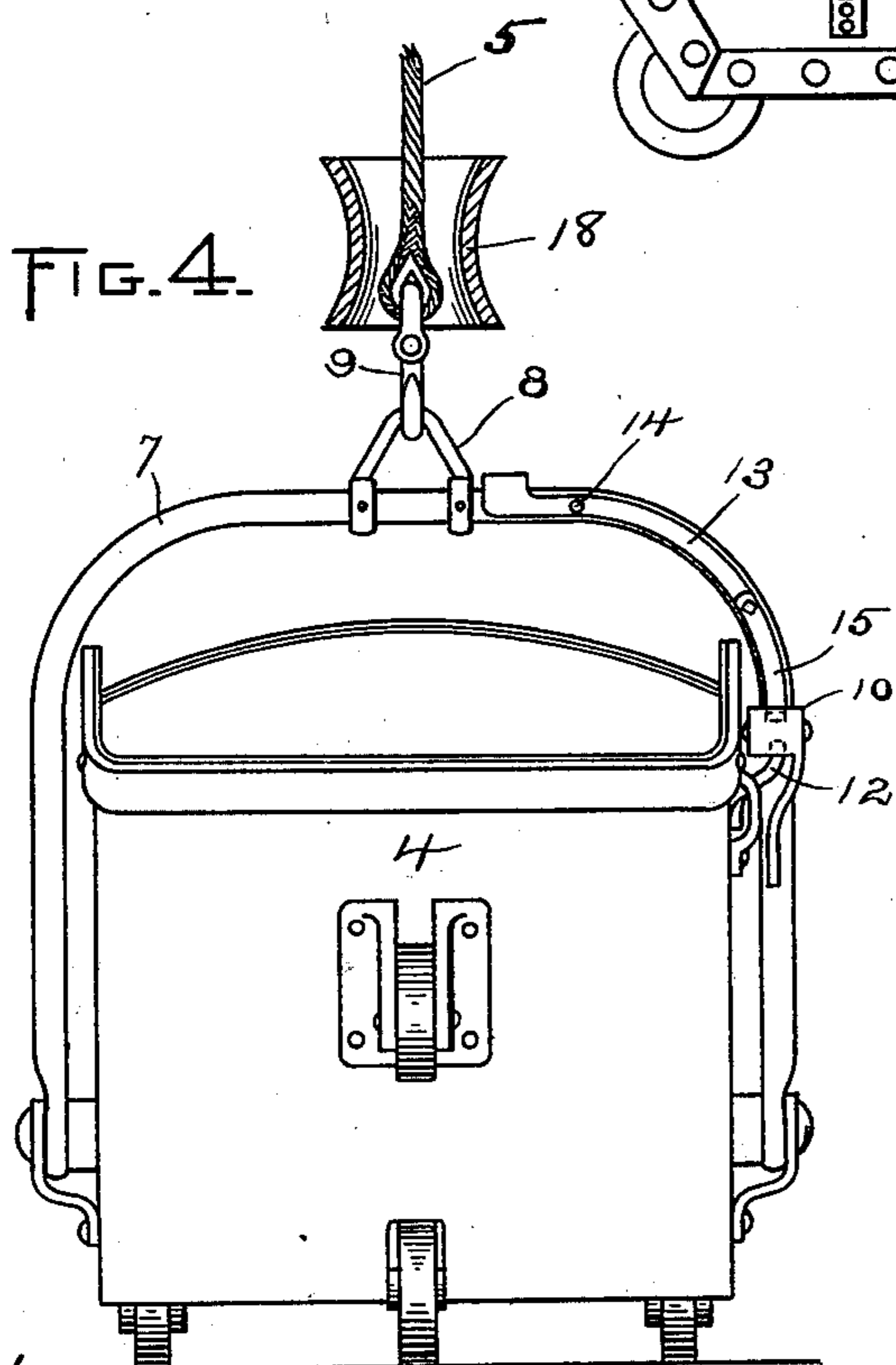
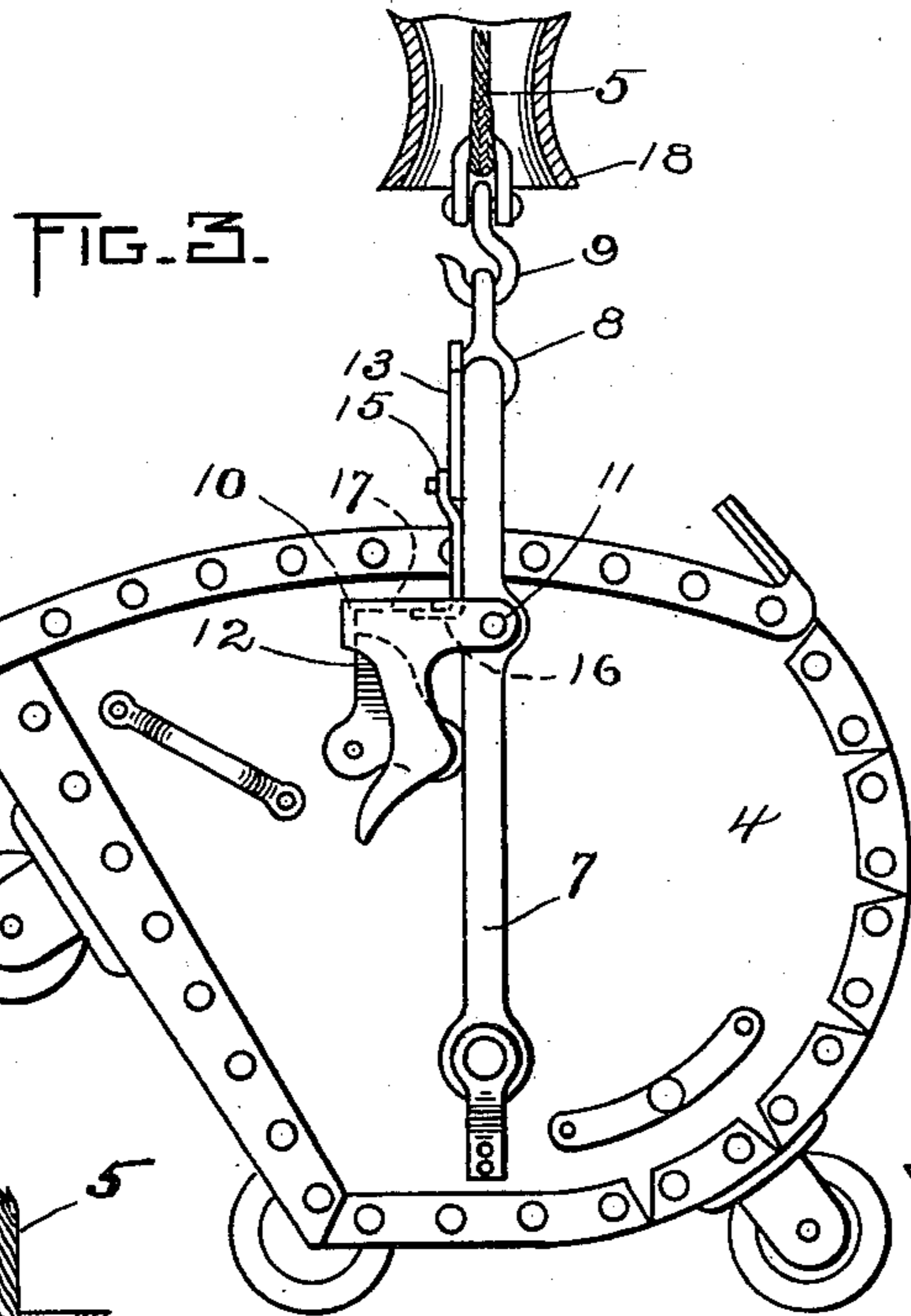
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3 Sheets—Sheet 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY J. COOK AND ALEXANDER MORRIS, OF BOSTON, MASSACHUSETTS.

HOISTING APPARATUS.-

SPECIFICATION forming part of Letters Patent No. 658,330, dated September 18, 1900.

Application filed June 4, 1900. Serial No. 18,928. (No model.)

To all whom it may concern:

Be it known that we, HENRY J. COOK and ALEXANDER MORRIS, of Boston, in the county of Suffolk and State of Massachusetts, have
5 invented certain new and useful Improvements in Hoisting Apparatus, of which the following is a specification.

This invention relates to apparatus of the rope-and-bucket type, such as is commonly
10 employed for removing coal from the holds of vessels.

The invention has for its object to provide means for automatically discharging the bucket; and to this end it consists in certain
15 novel features of construction and arrangement which we will now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a side elevation of a hoisting apparatus embodying our improvements, the bucket being shown just prior to discharge. Fig. 2 represents a similar view with the bucket upset and discharged. Fig. 3 represents a side elevation, on an enlarged scale,
25 showing the bucket and adjacent parts. Fig. 4 represents the corresponding front elevation. Fig. 5 represents a detail front elevation, illustrating the manner of discharging the bucket.

30 The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 represents a framework or tower, from the front of which projects an arm 2, forming a runway for the truck or trolley 3, which guides the horizontal movements of the bucket 4.
35

5 is the rope supporting the bucket, and 6 is the chute into which the bucket discharges.

The operation of hoisting apparatus of this
40 kind is well known, the elevation and descent of the bucket being accomplished by means of the rope or cable 5, which passes around the drum of a suitable motor, such as a steam-engine, which is revolved in reverse directions to alternately depress the empty bucket
45 into the hold of the vessel and elevate a full bucket to the chute 6 or to a car which may take the place of the chute. The trolley 6, controlled in a suitable manner, permits the
50 bucket to be run out, so that it is vertically alined with the hatch of the vessel and then

run in toward the chute to discharge its contents.

The bucket 4 is of the tilting type, being pivotally supported in a bail or frame 7, 55 which has a staple or loop 8 at its upper end to engage with a hook 9 on the lower end of the rope 5. The hinge-line or point of support of the bucket is so arranged that when loaded it is in unstable equilibrium and is 60 held in upright position by means of a catch, (illustrated at 10 in the drawings.) Said catch is pivoted at 11 to one of the side bars of the frame 7 and is adapted to take over a 65 lug or projection 12, attached to the side of the bucket 4. As shown in the drawings, the catch-releasing mechanism is organized with a lever 13, pivoted at 14 to the frame 7 and having its inner end located near the 70 middle of said frame, and a hook 15, pivoted at its upper end to the lever 13 and having a horizontal lip 16 at its lower end, which takes under a flange 17 on the catch 10. If pressure be applied to the inner end of the lever 13, so as to elevate the hook 15, the catch 10 75 will be raised out of engagement with the lug 12, and the bucket will thereby be released and allowed to discharge its contents. To accomplish this movement of the lever, we provide a bell or annular member 18, supported by means of ropes or similar flexible 80 suspending connections 19 19 from the truck or trolley 3 and adapted to depress the inner end of the lever 13 when the bucket is raised a sufficient distance to bring the lever into 85 engagement with the edge of said bell. The bell 18 is flexibly supported from the trolley 3 and made sufficiently heavy to tilt the lever 13 and release the catch when the bucket is elevated to the discharging position. The 90 rope 5, which passes through the trolley 3, passes also through the bell 18. This arrangement insures the engagement of the lever 13 by the edge of the bell 18, irrespective of the direction in which the bucket may be 95 turned.

We are aware that it has been proposed prior to our invention to attach an annular releasing-head rigidly to the trolley 3, said head acting to release certain catch mechanism and upset the bucket when the latter is 100 elevated into engagement with said releas-

ing-head. This construction, however, requires that the trolley shall at the moment of discharge be substantially in vertical alignment with the chute or other receptacle or point of deposit in order to insure that the contents of the bucket shall fall into said chute or receptacle or reach the desired point of deposit. Our invention distinguishes from this construction in that the releasing member or bell 18 is flexibly supported from the trolley at considerable distance below said trolley, and being thus located and confined to the hoisting-rope (as to lateral movement) it swings with the hoisting-rope during any pendulous movement which the bucket may undergo. The bell therefore follows the bucket to whatever point the latter may swing, and may be brought into action at any moment to release the catch by an elevating movement of the bucket. By employing our invention the pendulous movement which is naturally imparted to the bucket by reason of the horizontal movements of the trolley 3 may be utilized as a time-saving factor of considerable importance in discharging material, for in its inward movement along the arm 2 toward the chute the trolley may be stopped short of a point in full vertical alignment with the chute and the bucket allowed by inertia to swing into its discharge position and discharged as it reaches said position. This manner of operation is clearly set forth in Figs. 1 and 2. Fig. 1 shows the position when the trolley has been moved inwardly and stopped and the bucket is about to swing inwardly to its discharge position. Fig. 2 shows the bucket swung inwardly past the position of the trolley and discharged. There is a practical consideration which requires a considerable distance to exist between the bucket and the trolley—namely, that a container of the type known as a "grapple" is often substituted for the tilting bucket in hoisting apparatus of this kind, the grapple being best suited in some situations and the bucket in others. The grapple is usually of greater size than the bucket and requires a greater space to be left between the arm 2 and the chute 6 in order to accommodate it. With this additional space existing the bucket, if hoisted at each discharge nearly to the arm 2, would then be an undue distance away from the chute, and, moreover, to so hoist it would involve a needless waste of time. The bucket, then, is carried only high enough in discharging its load to clear the edge of the hopper, and to provide for this method of operation we bring the releasing-bell 18 down toward the bucket on a swinging connection from the trolley 3, allowing said bell to vibrate with the bucket. We regard a flexible connection between the releasing-bell and the trolley as an advantage from another point of view, since with a rigid connection there is danger of carrying away the arm 2 or doing other damage to the apparatus with an excessive upward movement of

the full bucket. In our improved apparatus the shock of the release is not transmitted to the trolley and arm, thus conducing to longer life of the apparatus, and should the bucket be accidentally raised into contact with the arm it will have been relieved by discharge of a great part of its weight, and thus having less momentum will be less likely to do damage.

We claim—

1. In hoisting apparatus, the combination of a bucket or holder, a hoisting-rope suspending the same, a truck or trolley guiding said rope, a transverse track or runway for the trolley, a releasing-weight suspended from the trolley by a flexible swinging connection at a distance below the trolley, and confined to the hoisting-rope as to lateral movement but free to move vertically up and down thereon by reason of the flexibility of said connection, the said construction and arrangement permitting the weight to partake of the pendulous movements of the bucket imparted by lateral movement of the trolley, and means carried by the bucket and operated by the weight for discharging the bucket when it is raised into contact with the weight.

2. In a hoisting apparatus, the combination of a tilting bucket having a bail by which it is supported, said bail having vertical side arms and a cross-arm, a catch pivoted to one of the side arms and engaging a lug on the bucket to normally hold said bucket in upright position, a lever pivoted to the cross-arm and having its inner end located near the middle of said arm in position to be engaged by a releasing member, a hooked member pivoted to the outer end of said lever and its lower end connected with and adapted to elevate and release the catch when the inner end of the lever is depressed, and a releasing member adapted to engage and depress the inner end of said lever.

3. In a hoisting apparatus, the combination of a tilting bucket having a bail by which it is supported, said bail having vertical side arms and a cross-arm, the catch pivoted to one of the side arms and engaging a lug on the bucket to normally hold said bucket in upright position, said catch having the flange 17, a lever pivoted to the cross-arm and having its inner end located near the middle of said arm in position to be engaged by a releasing member, a hook 15 pivoted at its upper end to the outer end of said lever and having the horizontal lip 16 taking under flange 17 on the catch, whereby when the inner end of the lever is depressed said catch is elevated and disengaged from the lug on the bucket, and a releasing member adapted to engage and depress the inner end of said lever.

In testimony whereof we have affixed our signatures in presence of two witnesses.

HENRY J. COOK.

ALEXANDER MORRIS.

Witnesses:

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C. F. BROWN.