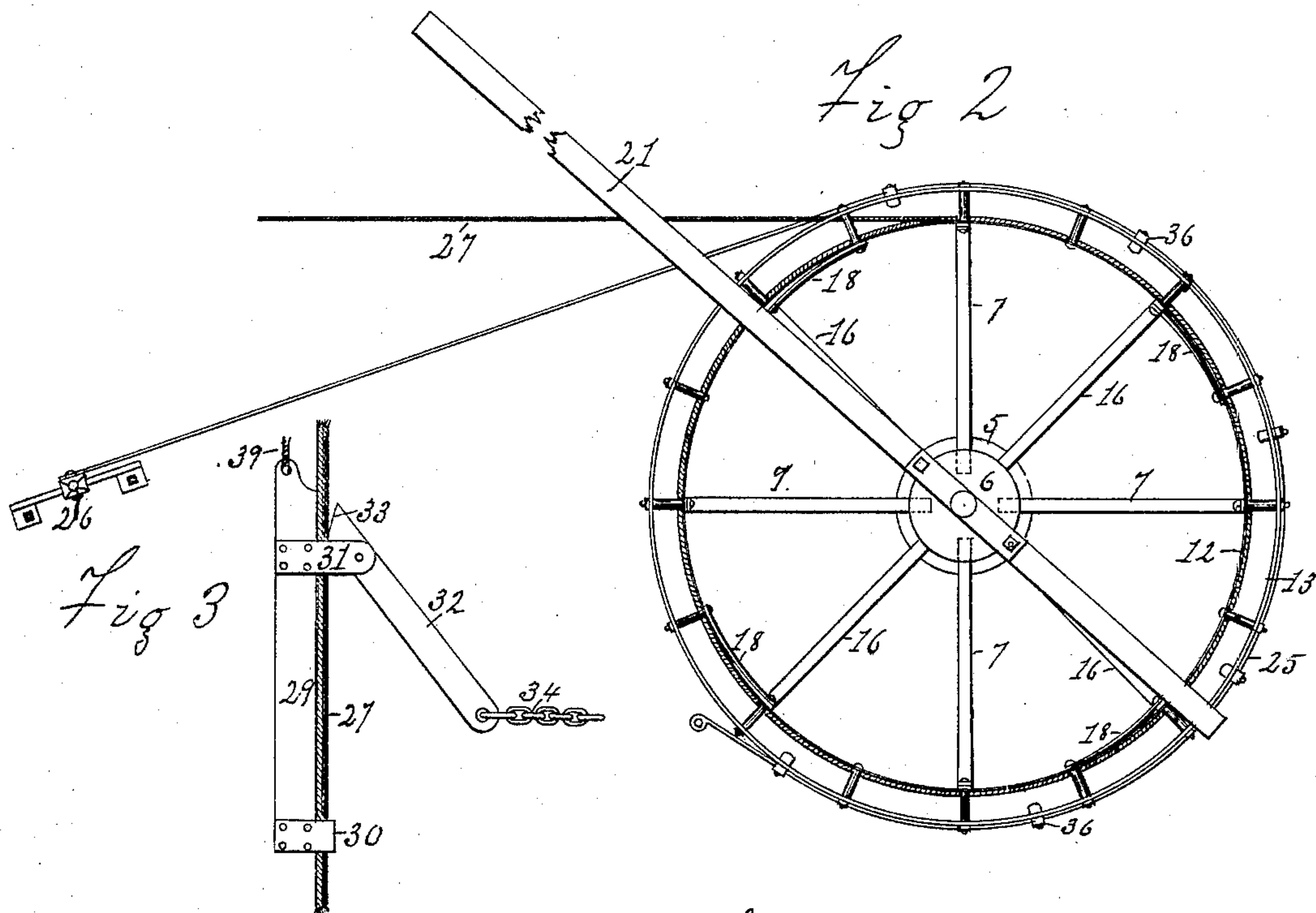
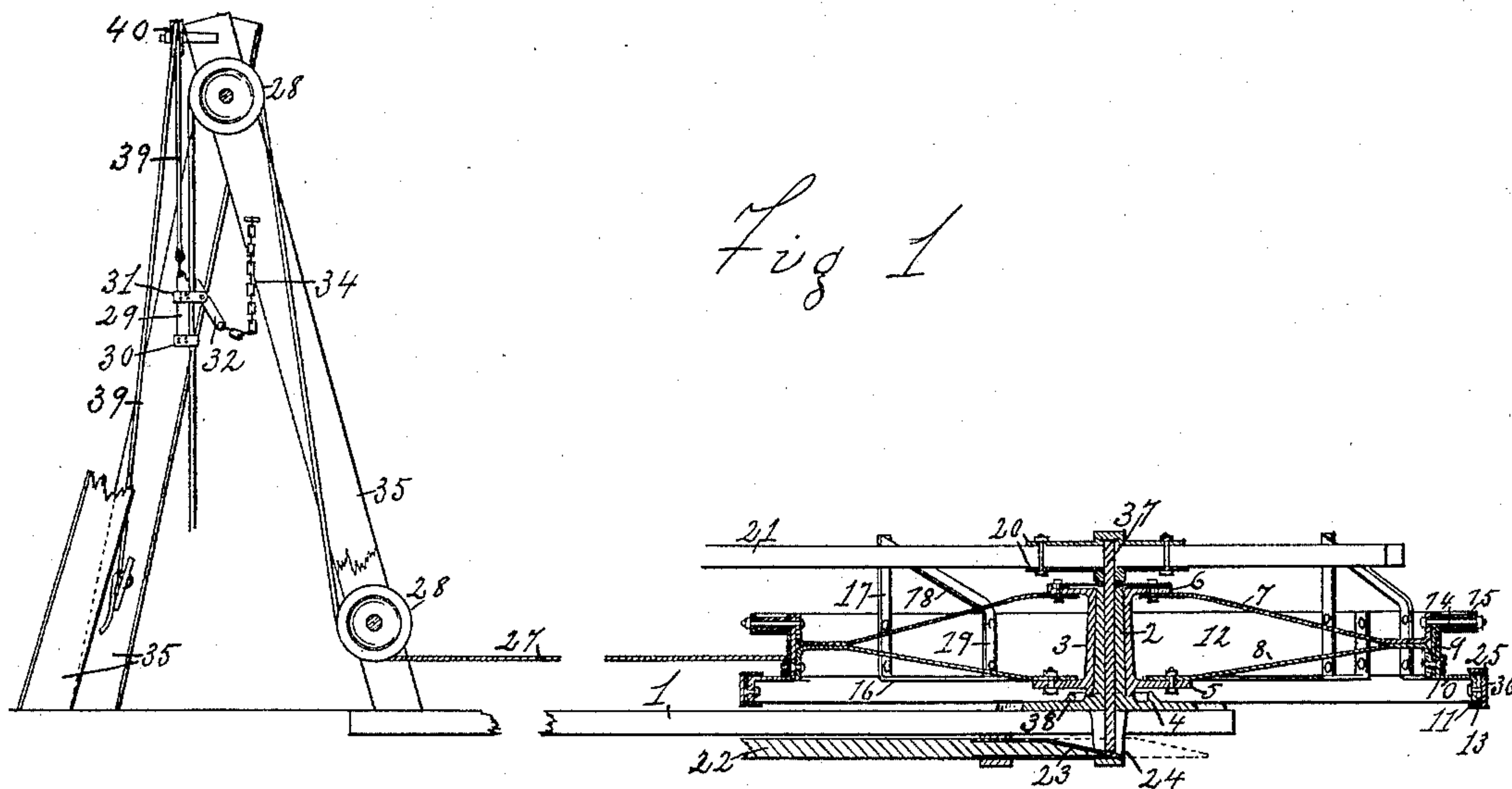


2 Sheets—Sheet 1.

No. 434,903.

Patented Aug. 19, 1890.



WITNESSES:

C. M. Day.
L. F. Wilber

James H. Montgomery
INVENTOR

BY *A. J. O'Brien*
his ATTORNEY

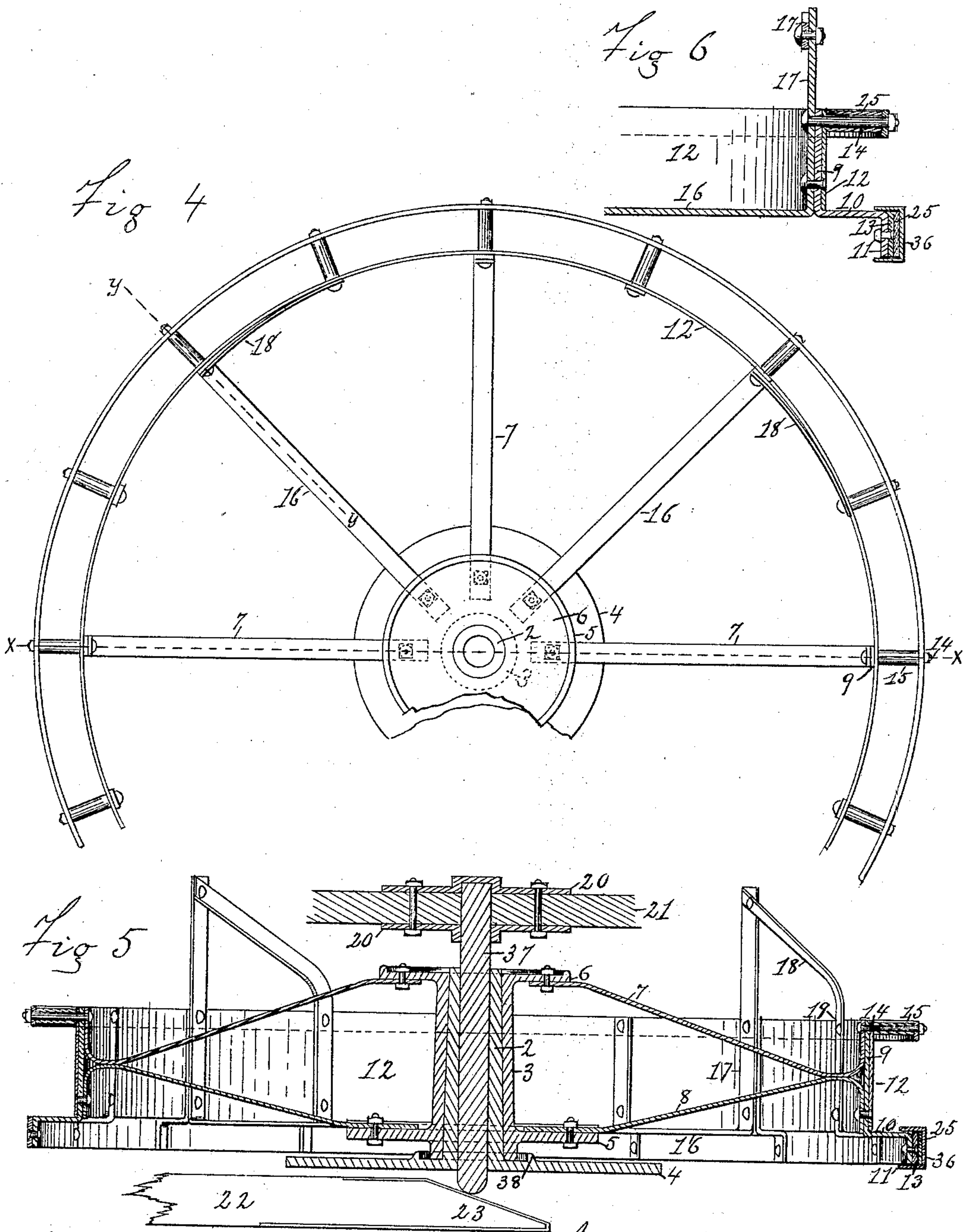
(No Model.)

2 Sheets—Sheet 2.

J. H. MONTGOMERY
HOISTING MECHANISM.

No. 434,903.

Patented Aug. 19, 1890.



Witnesses:
O. M. Day,
L. F. Wilber

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UNITED STATES PATENT OFFICE.

JAMES H. MONTGOMERY, OF DENVER, COLORADO.

HOISTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 434,903, dated August 19, 1890.

Application filed June 6, 1889. Serial No. 313,389. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MONTGOMERY, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Hoisting Mechanisms; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a hoisting or whim mechanism of the general type shown in my prior Letters Patent No. 269,433, issued to me April 8, 1884, and in my prior application filed November 4, 1887, and bearing Serial No. 254,295.

Its objects are to simplify and cheapen the construction of such mechanisms, first, by producing a winding-drum of very economical and simple, yet rigid, strong, and firm, construction, capable of enduring very great strain in proportion to the amount of material embodied therein, whose parts, when necessary for ease of transportation, are readily detachable and as readily assembled for use; and, second, to provide for use with the cable passing around a drum an automatic grip or stop adapted, when placed in operative position, to instantly grip and securely hold the cable against any backward or downward movement, such grip or stop being of an exceedingly simplified form, involving but few, in fact, a minimum of parts, the entire mechanism being readily operated and controlled, efficient, reliable, and durable, and without liability to become deranged or inoperative; to which ends the invention consists in the features, constructions, and combinations more particularly hereinafter described and claimed.

In the drawings is illustrated an embodiment of the invention, Figure 1 thereof being a side view or elevation of the derrick and automatic grip with the drum in section; Fig. 2, a plan or top view of the drum detached from the other parts; Fig. 3, an enlarged side view of the grip detached from Fig. 1; Fig. 4, an enlarged plan or top view of part of a de-

tached drum; Fig. 5, a section on line $x x$, of Fig. 4; Fig. 6, a section of part of the drum on line $y y$, Fig. 4.

In the figures the reference-numeral 1 indicates part of the base or framing upon which the drum is supported. Such framing may consist of two such longitudinal base pieces secured together by transverse pieces holding them at the proper distance apart. Secured thereupon in any suitable manner is the hollow king-post 2, it having an extended flange 4 at its base for such securement. Revolvably seated upon the exterior of such post is the hub 3 of the winding-drum, having a flange 5 near its base and a flange 6 at or near its top, upon which are secured the radial arms or spokes for supporting the outer rim of the drum. The lower end of such hub should take in an oil-reservoir formed on the flange 4 of the hollow king-post by a circumferential ridge 38 formed or cast thereupon.

As herein shown, the radial arms supporting the rim of the drum are of two types of construction, the one being compound, so to speak, and the other simple, four of each being shown, though, as will be hereinafter evident, the invention is not confined to any particular number, so that enough of either or of both be used to give the requisite support to the rim and rigidity to the drum. Of these arms the one type—the compound—are each formed of two arms 7 8, the former secured to the flange 6 and the latter to the flange 5 of the hub, they approaching each other and being joined together near the point where is to be the rim of the wheel, at which point the extreme ends of 7 and 8 are bent outwardly from each other, forming a base to which, in the case of each compound arm of the series, is secured a bracket-piece composed of a part 9, fastened to the bent-over ends of arms 7 8, a part 10 at or about at a right angle thereto, and a part 11, bent downwardly from 10, so as to be in a plane parallel to the plane of 9.

Upon and to the parts 9 of all the brackets supported by all the arms is secured the rim 12, upon which is to be supported and wound the cable 27, the term "cable" being used as typical of any flexible fabric—wire, hemp, or otherwise—which might be used in this construction.

The functions of the part 10 are to form a ledge preventing the cable from running off the bottom of the drum and to support the part 11, upon which is secured a tire or rim 13, on which takes the brake-strap 25, secured at one end to a post or pin on the base, thence passing around the rim to a lever 26, (shown herein in top view only in Fig. 2,) so that a greater or less brake-strain may be placed, as desired or needed, on the rim 13.

To form the upper ledge for preventing the cable from running off the drum on that side, bolts 14, seated at one end in the upwardly-projecting end of arm 7 and in the rim 9, are used, such bolts carrying at their other end a rim or tire separated from the cable rim or tire and maintained at a definite and uniform distance therefrom by distance-washers 15 upon the bolts and between the rim or tire 9 and the outer rim at the ends of the bolts 14, and such washers may be pieces of suitably-sized tubing cut to the proper lengths.

The other type of arms herein shown are connected or secured to the lower flange 5 only, and each consists of a horizontal part 16, extending out to and supporting a bracket composed of the parts 9 10 11, as before described, and thence rising upwardly by a part 17, and this to a height that a sweep 21, when in normal operative position, may take thereagainst. For the better bracing thereof, a strut 18 is secured to the top thereof, whence it inclines downwardly on the side away from that upon which the sweep contacts for rotation of the drum until it merges into a vertical part 19, carrying a bracket-arm 9 10 11, as hereinbefore described.

The upright arms 17 form the stops or, in effect, ratchets, against which the sweep takes to rotate the drum. As herein arranged four are shown, and the sweep will take against two at any one time—one on either side of the pivotal bearing of the sweep; but it is evident that the sweep might take against only one, and that a greater or less number of such stop-arms 17 might be used and that without regard to whether the sweep takes simultaneously against one or two stops or propelling-arms 17. It is also evident that all the arms supporting the brackets 9 10 11 carrying the rim might be arms secured to the lower flange 5, the proper number being carried up into stop or carrying arms or spokes 17, alternation with the compound arms or spokes 7 8, being preferable, however, in that the latter support the rim at both edges and confer greater stiffness thereupon. It is also evident that all the arms or spokes might be of the compound type described—that is, each composed of the single arms 7 8—the proper number of the former being carried up to form the sweep-stop or catch-arm 17 for the sweep to take against.

The sweep is secured to the upper end of a spindle 37, rotatably seated within the hollow king-post 2, and such securement may be

by bolting to one or more plates 20, formed upon or secured to the top of the spindle. To raise such spindle that the sweep may pass over the tops of whatever number of stops or catch-arms 17 are used, that the motive power may continue in motion without imparting motion to the drum, its lower end is made to project below the end of the hollow king-post and lie in the path of a throw-bar 22, having an inclined or wedge-shaped end 23, adapted to take under and raise the spindle, such throw-bar being guided by ways 24. (Shown only in Fig. 1.)

This construction and arrangement form an easily-working and a simply-constructed winding-drum, economical in that a minimum of material and labor is involved in its construction, yet sufficiently rigid and strong to successfully endure a great strain and to reliably wind up a cable 27, having attached thereto even a quite large weight. Such cable 27 passes from the drum over and around sheaves 28, supported by derrick-frame timbers 35, whence it passes from the upper sheave to the shaft, incline, or other excavation from which material is to be drawn. In such route, however, it passes through an automatic grip or clutch, which permits the cable to pass freely in one direction but when permitted grips and holds the cable against any movement in the other direction. Such a grip is shown at the left of Fig. 1 and in enlarged elevation in Fig. 3. It consists of a vertical member 29, along the inner edge of which travels the cable, the latter being held in loose engagement with the lower end thereof by a clip 30. Secured to and at or near the top of arm or limb 31 is pivoted the arm or member 32, having an incline or bevel 33 at its end, contiguous to arm or member 29. To its other end is attached a cord or chain 34, by which it is secured to one of the derrick-timbers 35.

Attached to the upper end of the vertical member 29 is a cord or chain 39, passing over a pulley or sheave 40, secured to the top of the derrick or at any other suitable point, by which the entire clutch may be raised or lowered.

In the position shown in the figures the cable may run easily through such clutch, but if the cable, rope, or chain 39, as shown in Fig. 1, be loosened, the clutch or grip immediately drops until the cable or chain 34, holding the end of member 32, becomes taut. Thereupon the beveled end 33, acting as an eccentric, is turned over upon and grips the cable between its end and the inner face of member 29, holding the cable securely and firmly against any further downward movement. It is to be understood that this or an equivalent grip may be applied to the cable, controlled in its movements by any winding-drum.

It is to be understood that inasmuch as the rim 13 for the brake-strap is quite narrow and the brake-strap might run or be crowded

therefrom, means for keeping the same in engagement therewith should be used. Such means are herein represented by clips 36, secured, it may be, to the brake-strap or to any other convenient point, the bent-over edges thereof loosely embracing the brake-strap and tire, so that the former may not travel vertically therefrom.

Having thus described my invention, what I claim is—

1. A hoisting-drum consisting of a central hub adapted to be seated and rotated on a king-post and flanged, as set forth, compound arms 7 8, secured to the flanges, a cable-supporting rim supported by such arms, and a brake rim or tire, a brake-strap, and a brake-lever, substantially as set forth.

2. In a hoisting mechanism, the combination of a central hub, arms secured thereto and extending radially therefrom, bracket-arms, as described, secured at the ends thereof, a rim or tire for the cable supported thereby, upper and lower flanges secured to such brackets, and arms 16 secured to the hub, projecting radially therefrom and provided with vertical parts 17, forming stops or catches for the sweep, substantially as described.

3. In a hoisting-machine, the combination of a central hub having a flange, arms secured thereto and extending radially therefrom, the outer ends thereof being bent upwardly to form stops or catches for the sweep, substantially as set forth.

4. In a hoisting-machine, a winding drum or wheel consisting of a central hub having

one or more flanges, arms secured thereto and extending radially therefrom, a rope-rim supported thereon, top and bottom flanges secured and supported therefrom, a brake rim or tire, a brake-strap, and a brake-lever, substantially as set forth.

5. The combination, in a hoisting-drum, of a central hub, arms or spokes extending radially therefrom, a rim for receiving a cable secured thereto, upper and lower flanges projecting beyond the plane of said rim, and a brake rim or tire, a brake-strap, and a brake-lever, substantially as set forth.

6. In a hoisting-machine, the combination, in the drum, of a central hub 2, arranged to rotate on a king-post, arms 7 8 and 16 17, secured thereto and projecting radially therefrom, brackets 9 10 11, and rims or tires 12 13, substantially as set forth.

7. A hoisting or winding drum having a central hub adapted to be seated and rotated on a king-bolt and flanged, as set forth, compound arms 7 and 8, secured to the flanges, a cable-supporting rim supported by such arms, a flange or rim, upon which may take a brake-strap, a brake-strap, and clips holding such strap in operative relation to the flange, substantially as set forth.

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

JAMES H. MONTGOMERY.

Witnesses:

Z. F. WILBER,
BRINTON GREGORY.