

(No Model.)

J. ALLENSON.
HOISTING MACHINE.

No. 460,491.

Patented Sept. 29, 1891.

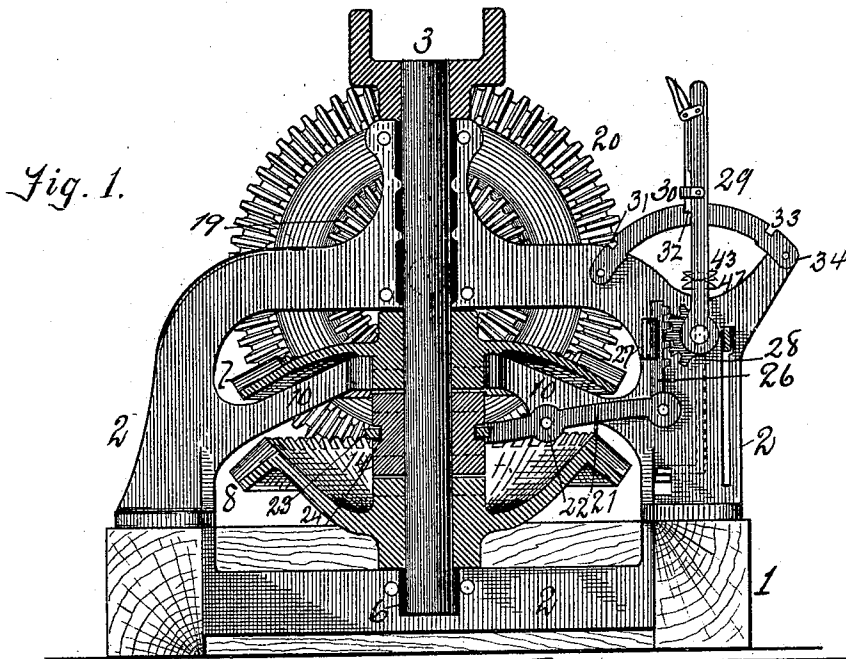
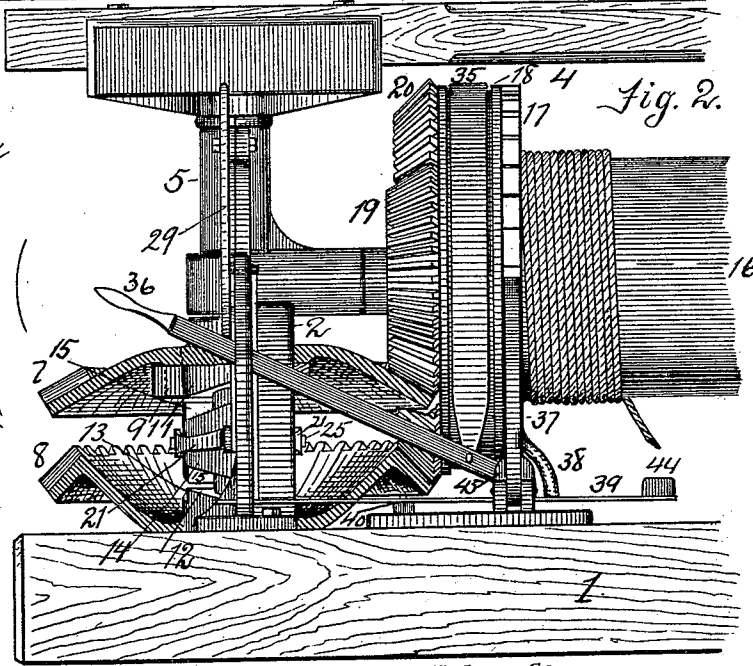
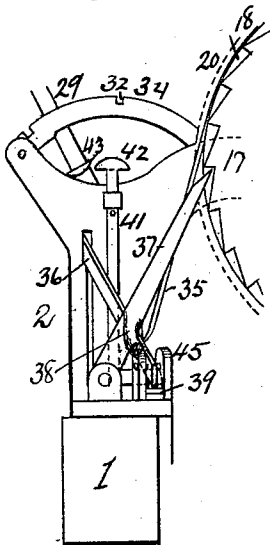


Fig. 3.



WITNESSES:

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JOHN ALLENSON, OF ST. PAUL, MINNESOTA.

HOISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,491, dated September 29, 1891.

Application filed March 2, 1891. Serial No. 383,493. (No model.)

To all whom it may concern:

Be it known that I, JOHN ALLENSON, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Hoisting-Machines; 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.

This invention relates to hoisting-machines, and is of that particular class in which horsepower is generally employed as the motive force.

The object of the invention is to obviate the necessity in throwing the drum-shaft into or out of operative connection with the driving-shaft or changing the speed of the former, of moving a gear upon either shaft, or by raising or lowering the drum-shaft bodily, one of which methods is commonly employed. The chief objections to these constructions are the complexity of mechanism necessary to accomplish the desired result, the lack of stability under load of the movable parts, and especially the liability to breakage of cogs and straining of shaft and bearings caused by throwing a stationary gear into mesh with a revolving one or the reverse, which latter disadvantage is common to both constructions above referred to.

The present invention consists in the construction and arrangement of parts hereinafter described, whereby the gears of the driving-shaft are at all times fully in mesh with those upon the drum-shaft and may be respectively thrown into and out of operative connection with the driving-shaft itself at the will of the attendant without changing the position of the gears or shaft, and at the same time securing a more simple, effective, and inexpensive construction.

The invention also consists in the means employed for throwing off the drum-retaining dog in connection with the lever for controlling the connection between the driving and drum shafts at the point when the two are

entirely disconnected without the necessity of operating a second lever.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents an end elevation, partially in section, of my improved hoisting-machine; Fig. 2, a side elevation of the same, also partly in section; and Fig. 3, a detail view of the throwing-off mechanism controlling the drum-dog.

Upon a suitable base 1, generally of wood, is mounted the iron frame-work 2, supporting and furnishing bearings for the operative parts of the machine. These consist of an upright shaft 3, adapted to carry at its upper extremity a suitable sweep 4 for the attachment of horse or similar motive power, and a horizontal drum-shaft in connection therewith or adapted to be disconnected therefrom at the will of the operator. The driving-shaft at its upper extremity is mounted in a suitable bearing 5 at the upper part of the frame, which may be furnished with a lining or bearing-surface of Babbitt or similar metal, and at its base in a step-bearing 6 at the lower part of the frame. Between the two bearings are carried two bevel-gears 7 and 8, loose upon the shaft, the upper one 7 supported by a collar 9, carried by arms 10, formed in one piece with the frame, and the lower one 8 supported upon the lower part of the frame around the step-bearing 6. The collar 9 may be cast in one piece with the frame by forming the same in U shape, leaving one side of the same open for a width equal to the diameter of its curved part for the introduction of the hub of the gear 7. In this case its bearing-surfaces should be chilled to prevent excessive friction and wear. The adjacent faces of the hubs 11 and 12 of the gears 7 and 8, respectively, are provided with clutch-teeth 13 of any desired form, and between the two upon the shaft is located a clutch member 14, having teeth 15 upon both upper and lower faces, corresponding, respectively, with those upon the hubs. This clutch member is so secured upon the shaft by a key, feather, or otherwise as to rotate with the same and at the same time be capable of a longitudinal movement with respect thereto in order that it may be thrown into

engagement with either gear 7 or 8 or out of engagement with both, the length of the clutch and the distance apart of the two hubs being such that when in a position intermediate of the two hubs the teeth of the clutch member will clear those of the hubs. It will thus be seen that either of the gears 7 or 8 may be thrown into operative connection with the drive-shaft and rotate therewith, or the shaft may turn without moving either of the gears, and that the vertical position and bearing of the gears remain the same in all cases.

Upon the horizontal shaft is mounted the winding-drum 16, having rigidly connected thereto or to the shaft or preferably formed integral with the drum the ratchet 17, brake-wheel 18, and concentric bevel-gears 19 and 20, respectively in mesh with the gears 7 and 8. The radius of the gear 19 is less than that of the gear 20 by an amount equal to the vertical distance apart of the two cog-faces of the gears 7 and 8. Whichever of the two gears 7 and 8 is in operative connection with the driving-shaft controls the speed of the winding-drum, while the other gear moves idly upon the driving-shaft by the impulse of its mate upon the drum-shaft.

The position of the movable clutch member 14 is controlled by means of a lever 21, pivoted upon the frame, as at 22, and carrying at one extremity a collar 23, lying in a circumferential groove 24 upon the clutch member. The lever 21 is forked at its inner extremity and supports the collar 23 by means of pins or lugs 25, formed upon or secured to the latter in diametrically-opposite positions and passing through or into the extremities of the arms of the fork. The outer extremity of the lever 21 is connected with a rack-bar 26, working in a guide 27 upon the frame, which rack is in mesh with a segment-pinion 28, carried by a hand-lever 29, pivoted upon the frame. The operation of the lever 29 will thus raise or lower the clutch member 14 upon the driving-shaft to cause its engagement with either of the gears 7 or 8 or hold it in an intermediate position between the two. The lever 29 is provided with a catch 30 in position to engage with notches 31, 32, and 33 upon a segment-bar 34 to retain the lever in either of the three positions required for the several positions of the clutch member.

The brake-band 35, controlled by lever 36, is of usual form, and a dog 37, hinged to the base 1 in position to engage with the drum ratchet-rim 17, serves as a detent to prevent the backward movement of the drum. When, however, it becomes necessary to allow the hoisting-rope to unwind from the drum, the dog is disengaged from the ratchet in the following manner simultaneously and by the same operation necessary to throw both driving-shaft gears out of operation. The dog or detent 37 is provided with a spur, lug, or projection 38, which rests upon a somewhat elastic lever 39, fulcrumed at a point about mid-

way between the dog and the frame 2, as at 40. Upon the back of the frame 2 is mounted in suitable guides, so as to move vertically, a bar 41, with its lower extremity resting upon the lever 39 and having a projection 42, with a rounded upper face, in position to be engaged and depressed by a similar lug or projection 43, carried by the hand-lever 29, when the latter comes into its middle position—that is, when in position to throw the clutch member 14 out of engagement with both gears 7 and 8. The bar 41 being thus depressed, the outer extremity of the lever 39 is raised, thus lifting the dog 37 out of engagement with its ratchet. The weight of the dog will generally suffice to throw the bar 41 back into normal position when disengaged from the lug upon the lever 29; but if not, the lever 39 may be extended beyond the dog and its outer extremity provided with a weight 44. The lever 39 is held in position by passing between the ears of the bracket 45, in which the end of the brake-lever is mounted.

I claim as my invention—

1. The combination, with the drum, of two concentric bevel-gears of different diameters formed upon or secured to the drum at one extremity thereof, a driving-shaft disposed at right angles to the axis of the drum, two bevel-gears loose upon said driving-shaft and in mesh, respectively, with said drum-gears, and means for operatively connecting said loose gears alternately with said driving-shaft to rotate in unison therewith, substantially as and for the purpose herein specified.

2. The combination, with the drum, of two concentric bevel-gears of different diameters formed upon or secured to the drum at one extremity thereof, a driving-shaft disposed at right angles to the axis of the drum, two bevel-gears loose upon said driving-shaft and in mesh, respectively, with said drum-gears, clutch-teeth formed upon the adjacent hub-faces of said loose gears, a double clutch member having corresponding faces rotating with said driving-shaft, but movable longitudinally thereon, and means for moving said clutch member into engagement with either of said loose gears, substantially as and for the purpose specified.

3. The combination, with the drum, of a ratchet-rim and two concentric bevel-gears of different diameters formed upon or secured to the drum at one extremity thereof, a driving-shaft disposed at right angles to the axis of the drum, two bevel-gears loose upon said driving-shaft and in mesh, respectively, with said drum-gears, a clutch member longitudinally movable upon said driving-shaft between said gears and adapted to engage alternately with corresponding clutch-faces upon said loose gears, a segment-lever for operating said clutch member, a detent-pawl adapted to engage with said ratchet-rim, a rocking lever upon the frame, having one extremity underneath an extension upon said detent, and a sliding arm resting upon the

other extremity of said lever and adapted to be depressed by said clutch-lever when in position to throw the said clutch member out of engagement with both of said loose gears, substantially as and for the purpose specified.

4. In a hoisting-machine, the combination, with the drum having a ratchet-rim and two concentric bevel-gears of different diameters, a driving-shaft having loose gears in mesh with said drum-gears, and a lever adapted to operate clutch mechanism for throwing said gears alternately into and both gears out of operative connection with said driving-shaft, of a detent-pawl adapted to engage with said

ratchet-rim, a rocking lever fulcrumed upon the frame and having one extremity underneath said detent, and a sliding bar having one end resting upon said rocking lever and its other extremity in position to be engaged and depressed by said clutch-lever when in position to throw both gears out of operative connection with the driving-shaft, substantially as specified.

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

JOHN ALLENSON.

Witnesses:

THOS. T. FAUNTLEROY,
F. W. LANE.