

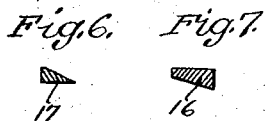
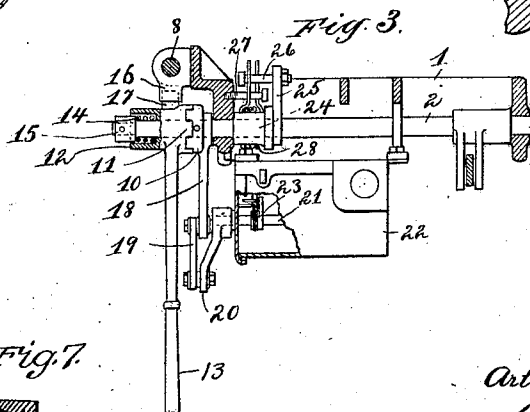
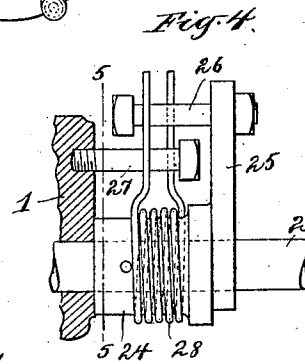
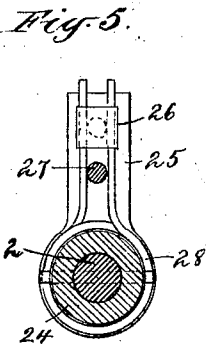
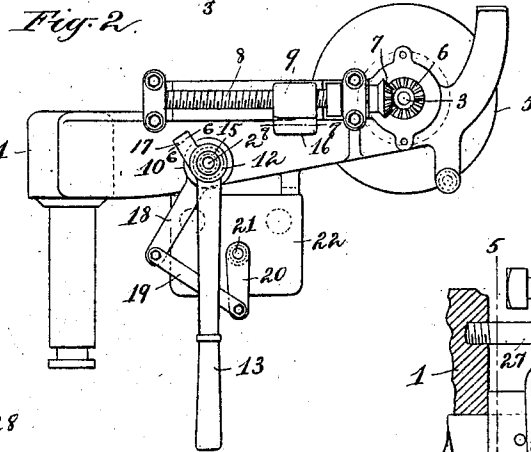
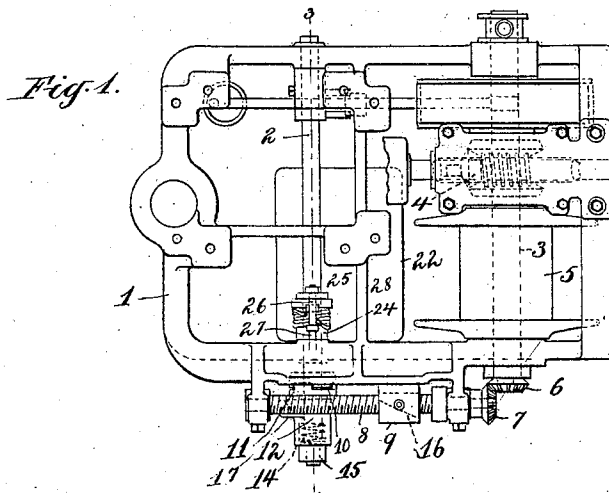
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1,452,964

A. FALKENAU

HOISTING MECHANISM

Filed April 9, 1921



Inventor:
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UNITED STATES PATENT OFFICE.

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HOISTING MECHANISM.

Application filed April 9, 1921. Serial No. 459,963.

To all whom it may concern:

Be it known that I, ARTHUR FALKENAU, a citizen of the United States, residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented a certain new and useful Improvement in Hoisting Mechanism, of which the following is a specification.

The invention relates to electrically operated hoisting machines, and more particularly to ash-hoists designed to raise ashes and like loads in sidewalk hoistways.

The present invention is based on the structure shown and described in Letters Patent of the United States granted to Joseph H. Donat for an improvement in hoisting mechanism, dated March 9, 1920, No. 1,333,064, in which the hoisting, lowering, and braking operations together with the operation of the switch are all controlled by swinging a single operating-lever into corresponding positions, the operating-lever being automatically forced into the neutral position at the completion of the hoisting operation by a slow reverse movement of the lever, the result being a slow movement of the controller switch in breaking the circuit to stop the motor.

The object of the present invention is to provide simple and efficient means for automatically disconnecting the operating-lever from its shaft and turning the latter and the controller switch instantly to the neutral position when the hoisting operation is completed.

The invention consists in certain novel features of construction and arrangement by which the above objects are attained, to be hereinafter described and claimed.

The accompanying drawings form a part of this specification and show the invention as it has been carried out in practice.

Figure 1 is a plan view of a hoisting head constructed in accordance with my invention, with the main portions of the electric motor omitted.

Figure 2 is a corresponding side elevation.

Figure 3 is a vertical transverse section through the head, taken on the line 3—3 in Figure 1, mainly in elevation and showing the operating-shaft and its connections.

Figure 4 is an elevation on a larger scale showing the means for automatically turning

the operating-shaft to the neutral position, and partly in vertical section.

Figure 5 is a corresponding vertical section taken on the line 5—5 in Figure 4, partly in elevation.

Figure 6 is a sectional view taken on the line 6—6 in Figure 2.

Figure 7 is a horizontal section taken on the line 7—7 in Figure 2.

Referring to the drawings, the operating-shaft 2 extends transversely of the hoisting-head 1 and is equipped to operate the brake on the hoisting-shaft 3 and thus control the action of the differential gear, indicated at 4, and the hoisting-drum 5, in a manner analogous to that set forth in Letters Patent No. 1,333,064 above referred to, and the hoisting-shaft 3 through the beveled pinions 6 and 7 turns a screw-shaft 8 alternately in opposite directions as the load is raised or lowered, and causes a nut 9 to travel correspondingly on the screw-shaft substantially as in such Letters Patent.

In the present invention the overhung end of the operating-shaft 2 carries an annular serrated clutch member 10 adapted to be engaged by a similar clutch member 11 on the head 12 of the operating-lever 13, loosely inclosing the shaft 2 and held in separable engagement with the member 10 by a helical expansion spring 14 encircling the end of the shaft 2, received in an annular recess in the head 12, and abutting against the collar 15 fixed on the shaft 2.

Depending from the nut 9 is a lug 16 having its outer vertical face beveled or inclined from front to rear as shown in dotted lines in Figure 1, and adapted at the termination of its rearward travel to contact against an oppositely inclined surface on the inner face of a spur 17 fixed on the head 12 and thus move the latter outwardly and axially to disengage the clutch members and release the operating-shaft 2 from the operating-lever 13.

On the annular clutch member 10 and shown as integral therewith is an arm 18 extending downwardly and pivotally connected at its end to a link 19 which is similarly joined to a crank-arm 20 on the controller-shaft 21 extending into the controller box 22 and carrying the usual movable arm of a switch indicated at 23 in Figure 3.

Fixed on the operating-shaft 2 adjacent

to a portion of the frame is a long collar 24 having a radially extending arm 25 carrying a pin 26 parallel with the shaft, and from the frame extends another pin 27 located out of the arc described by the pin 26 in its oscillations with the operating-shaft. The collar 24 is encircled by a helical torsional spring 28 having its ends extended radially in the same direction but separated by the pins 26 and 27 as shown in Figures 4 and 5, and so disposed by the pins as to exert its force to hold the shaft 2 yieldingly in the neutral position shown in Figures 4 and 5 in which the current is cut off from the motor by the switch 23.

The operation is as follows:—Assuming the operating-lever 13 to be engaged with its clutch and swung to the left in Figure 2; in this position the operating-shaft will be partially rotated against the resistance offered by the spring 28, the switch 23 will be thrown to the position to supply current to the motor, the hoisting-drum will be revolved in the direction to hoist the load, and the nut 9 traversed along the screw-shaft 8 toward the head 12 of the operating-lever 13. At the limit of the hoisting movement the lug 16 on the nut engages the spur 17 and forces the head 12 outwardly against the force of the expansion spring 14 while the operator still holds the operating-lever 13 in the hoisting position, thus separating the clutch members 10 and 11 automatically and releasing the shaft 2, which, by the tension of the torsional spring 28, instantly returns to the neutral position and through the connections 18, 19 and 20 throws the switch 23 in the direction to cut off the current to the motor. The same partial revolution of the operating-shaft 2 conditions the brake mechanism to hold the load suspended. The operating-lever 13 may be returned by the operator or by gravity to its neutral position in which its clutch member 11 will again engage with the clutch member 10 on the shaft, and may then be swung in the opposite direction to lower the load when desired.

The engaging faces of the clutch members are preferably rectangular to permit them to slide readily upon each other, and it will be noted that the disengagement of the clutch members, the return movement of the operating-shaft, and the action of the switch 23 are practically instantaneous instead of the relatively slow action produced by the gradual advance movement of the nut against the lever in the structure shown in the Letters Patent above referred to.

Other means than the torsional spring 28 may be employed to return the operating-shaft to its neutral position, and the means employed to transfer such movement to the switch may be varied, and other modifications may be made as found necessary or

desirable in adapting the invention to various types of hoisting mechanism.

I claim:—

1. In a mechanism of the character set forth, a screw-shaft, a nut arranged to travel thereon, an operating-shaft having a clutch member and connections to a switch, an operating-lever on said operating-shaft, having a clutch member adapted to engage said shaft clutch member to turn said operating-shaft, means actuated by said nut for disengaging said clutch members, and means for automatically returning said operating-shaft.

2. In a mechanism of the character set forth, a screw-shaft, a nut arranged to travel thereon and having an inclined face, an operating-shaft having a clutch member and connections to a switch, an operating-lever slidably mounted on said operating-shaft and having an inclined face and a clutch member adapted to engage said shaft-clutch member to turn said operating-shaft, said inclined faces adapted to contact and separate said clutch members, and yielding means for automatically returning said operating-shaft.

3. In a mechanism of the character set forth, a screw-shaft, a nut arranged to travel thereon, an operating-shaft having a clutch member, an operating-lever slidably mounted on said operating-shaft, having a clutch member adapted to engage said shaft clutch member to turn said operating-shaft, means actuated by the movement of said nut for disengaging said clutch members, yielding means for automatically returning said operating-shaft, and yielding means for re-engaging said clutch members.

4. In a mechanism of the character set forth, a hoisting-shaft, an operating-shaft having connections to a switch, an operating-lever slidably mounted on said operating-shaft, a clutch between said operating-lever and operating shaft, means actuated by said hoisting-shaft for disengaging said clutch, and means for automatically returning said operating shaft to the neutral position when said clutch is disengaged.

5. In a mechanism of the character set forth, a hoisting shaft, an operating-shaft having connections to a switch, an operating-lever slidably mounted on said operating-shaft, a clutch between said operating-shaft and operating-lever, means actuated by said hoisting-shaft for disengaging said clutch, means for automatically returning said operating-shaft to the neutral position when said clutch is disengaged, and yielding means for moving said clutch into re-engagement.

In testimony that I claim the invention above set forth I affix my signature.

ARTHUR FALKENAU.