

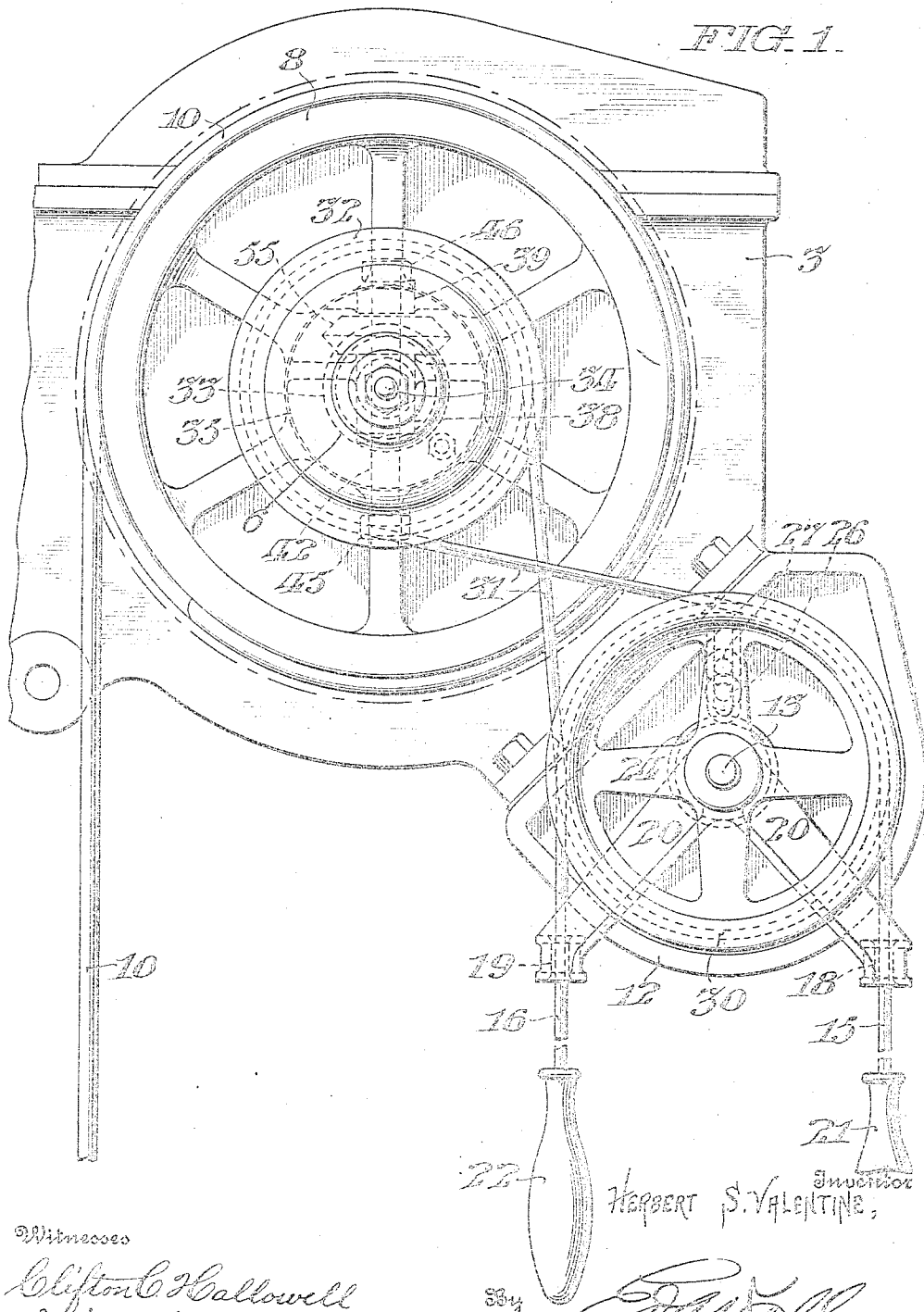
H. S. VALENTINE.
 STOPPING DEVICE FOR ELECTRIC HOISTS.
 APPLICATION FILED JULY 24, 1912.

1,060,383.

Patented Apr. 29, 1913.

2 SHEETS-SHEET 1.

FIG. 1.



Witnesses

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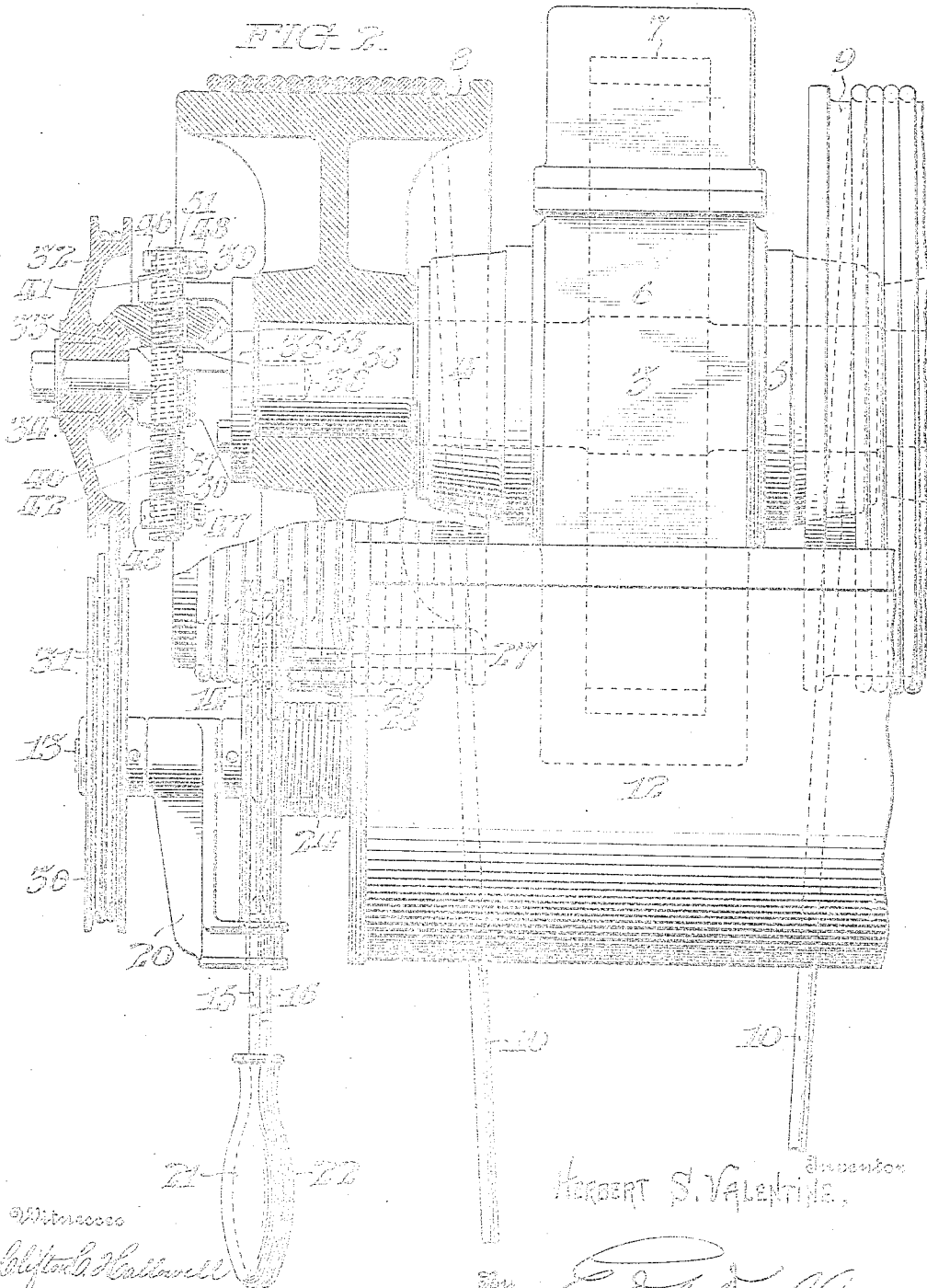
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Witnesses
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STOPPING DEVICE FOR ELECTRIC HOISTS.

1,060,383.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERBERT S. VALENTINE, citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Stopping Devices for Electric Hoists, of which the following is a specification.

My invention particularly relates to automatically actuated stopping mechanism, and is especially applicable to electric hoists, for limiting the rotation of the drums and the consequent throw of the load lifting hook.

The principal objects of my invention are to provide simple and efficient means to automatically stop the motor of an electric hoist when the lifting hook has reached the predetermined limit of its throw in either its raising or lowering movement; and to provide means adjustable to vary the limit of movement of said hook in either direction independently.

Other objects of my invention, specifically stated, are to provide manually actuated mechanism for controlling the winding drum, with means to normally maintain it in an inoperative position, and to connect automatically actuated mechanism therewith, having means actuated by the rotation of said drum to effect the actuation of said controlling mechanisms for stopping said winding drum when it has made a predetermined number of revolutions.

This invention also includes all of the various novel features of construction and arrangement of the parts as hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is a fragmentary end elevation of an electric hoist conveniently embodying stopping mechanism constructed in accordance with my invention, and Fig. 2 is a fragmentary sectional elevation of said hoist as seen from the right hand of Fig. 1.

In said figures the gear casing 3 provides suitable bearings 4 and 5 for the shaft 6, which is driven by the gear 7, and which carries the winding drums 8 and 9, around which the opposite ends of the hoisting cable 10 are helically coiled.

The rotation of the drums 8 and 9 is conveniently controlled by controlling mechanism included in the controller casing 12, and having the shaft 13 projecting therefrom. Said shaft 13 carries the manually

actuated sheave 14 pinned thereto, and having the cords 15 and 16 secured thereto and respectively depending peripherally from the diametrically opposite cylindrical surfaces of said sheave through the eyes 18 and 19 in the guide 20, and having the hand grips 21 and 22 respectively, by which it may be partially rotated in either direction.

The sheave 14 and the shaft 13 are normally maintained in a neutral or inoperative position by the spring 24 which is coiled around the hub 25 of the sheave 14 and has its opposite free ends extending therefrom in substantially parallel relation on respectively opposite sides of the stationary pin 26 projecting from the casing 12 and the movable pin 27 projecting from the sheave 14 in substantially parallel relation with the pin 26 and movable with respect thereto in a cylindrical path in opposition to tension of said spring 24 which tends to shift said pins 26 and 27 into a common plane with the axis of the shaft 13, and thereby maintain the controlling mechanism inoperative.

The guide 20 is loosely mounted on the shaft 13, between the manually actuated sheave 14 and the automatically actuated sheave 30, which is also pinned on the shaft 13 and which is connected by the crossed belt 31 to rotate with the sheave 32, having the miter gear 33 loosely journaled on the stud 34 projecting from the bracket 35 which is carried by the drum 8, said stud 34 being coaxial with the shaft 6 upon which said drum is mounted.

The bracket 35 is provided with the bosses 38 and 39 respectively having the shoulders 40 and 41 forming convenient stops, and having coaxially aligned apertures through which the screw threaded stopping shaft 42 extends in threaded engagement with the boss 38.

The screw shaft 42 is provided at its opposite extremities with the collars 45 and 46, which are adjustably secured thereon by the set screws 47 and 48, and which are respectively provided with shoulders 50 and 51, forming stops respectively arranged to engage the stops 40 and 41 on the bosses 38 and 39 to limit the rotation and consequent axial movement of the screw shaft 42.

The rotation of the screw shaft 42 is conveniently effected by the miter gear 55 which is mounted thereon between the bosses 38

and 39, in toothed engagement with the miter gear 33, and which is forced to rotate with said screw shaft 42 by the key 56 arranged to traverse the slot 57 therein as it moves axially through the bosses and gear.

It will be obvious from the foregoing description that when one or the other of the hand grips 21 or 22 is pulled by the operator, the shaft 13 will be rotated correspondingly to throw on power which effects the rotation of the drums 8 and 9, and that such rotation of the drum 8 carries the miter gear 55 in a cylindrical path about the axis of rotation of said drum, in toothed engagement with the miter gear 33, which being held stationary causes the gear 55 to rotate the screw shaft 42 until the stop on said shaft engages its coöperative stop on the boss, which prevents further relative rotation of the screw shaft 42, thereby locking the gears in relatively fixed relation, so that the further rotation of the winding drums effects a similar rotation of the gear 33, and the controlling mechanism connected therewith, to return the shaft 13 to its neutral or inoperative position shown in the drawings.

It is not desired to limit this invention to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of the invention as defined in the appended claims.

Having thus described my invention, I claim:—

1. In an electric hoist, the combination with a driving shaft, of a controller therefor, having a shaft, a sheave secured on said shaft, means for rotating said sheave and shaft, means for limiting the rotation of

said sheave and shaft, and tending to return them to inoperative position, a second sheave secured to said shaft, a sheave carried by said driving shaft in coaxial, relatively rotatable relation therewith, a belt connecting the second mentioned sheave with the third, a miter gear in fixed relation with the sheave on said driving shaft, a threaded shaft carried by said driving shaft, a miter gear connected to rotate said threaded shaft, and carried by said driving shaft in a cylindrical path in toothed engagement with the first mentioned gear, and means actuated by the rotation of said threaded shaft to stop its rotation, and lock said gears in relatively fixed relation.

2. In stopping mechanism having controlling mechanism, the combination with a bracket having shoulders forming stops, and a stud shaft, of a miter gear mounted for rotation on said shaft, means operatively connecting said gear with said controlling mechanism, a screw shaft in threaded engagement with said bracket and rotatable on an axis transverse to the axis of rotation of said stud shaft, a miter gear keyed to said screw shaft, and carried in a cylindrical path in toothed engagement with the first mentioned gear, and means carried by said screw shaft for engaging said stops and preventing further rotation of said shaft and gear on the transverse axis, to lock said gears in relatively fixed relation.

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

HERBERT S. VALENTINE.

Witnesses:

ED. A. KELLY,

MARY E. STAUFFER.