S. H. MILLER.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED APR. 29, 1915.

1,197,529.

Patented Sept. 5, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

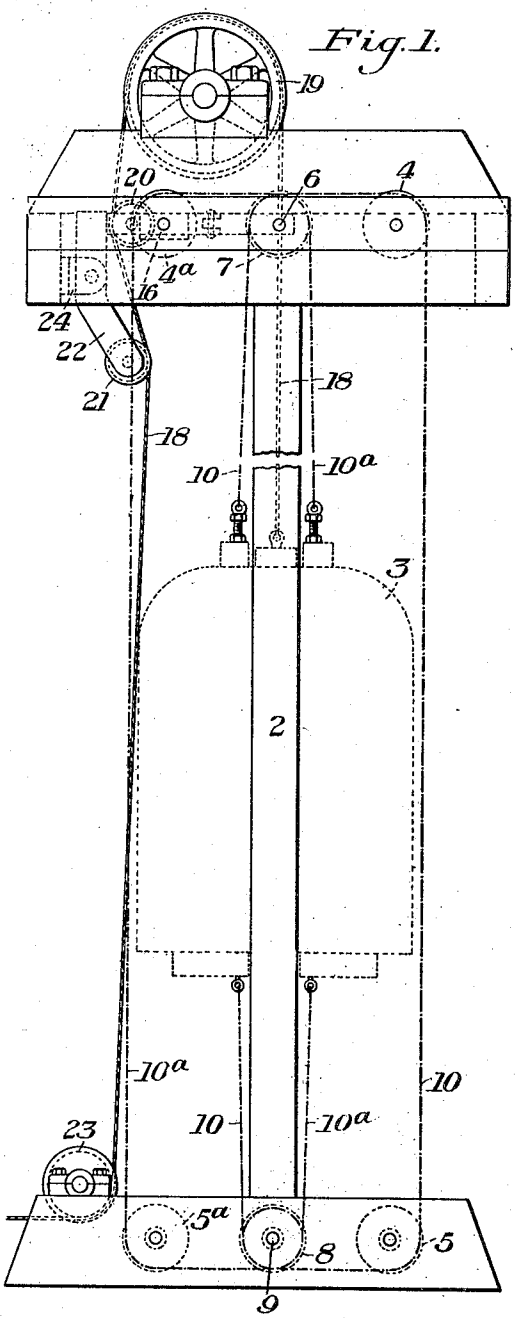


Fig. 3.

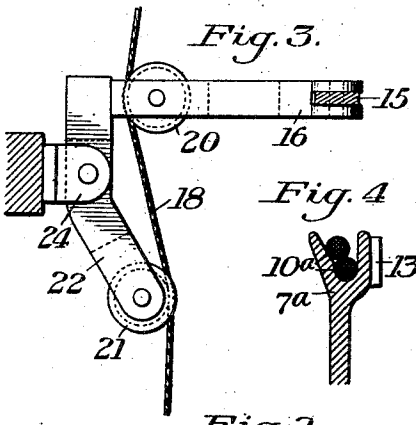
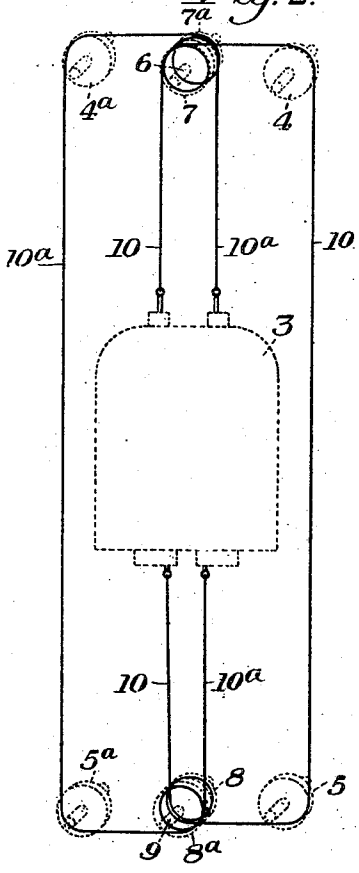


Fig. 4

Fig. 2.



WITNESSES

R. A. Balderson

D. B. Fleming

INVENTOR

S. H. Miller

by Bakewell, Byrnes & Parmele

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 5.

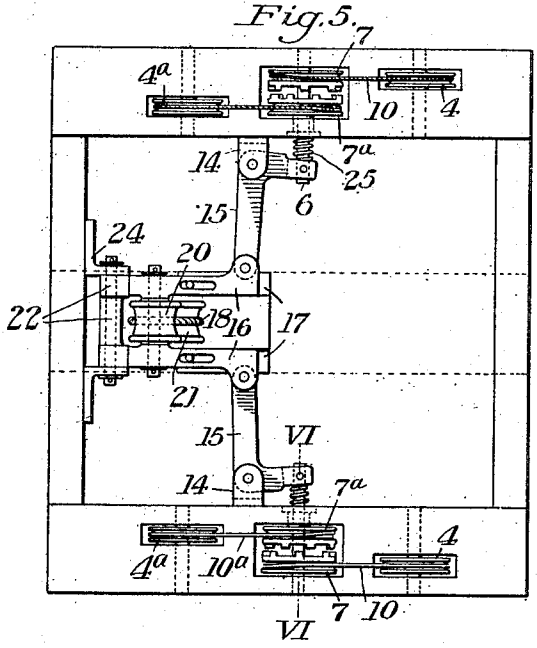


Fig. 6.

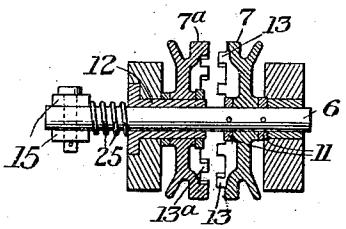


Fig. 6a.

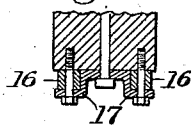


Fig. 8.

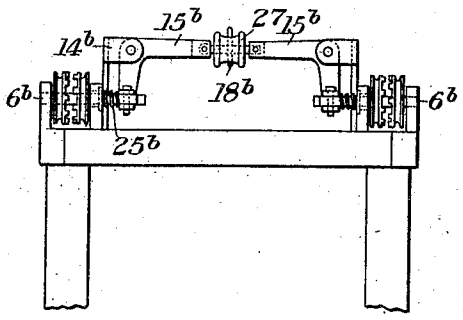


Fig. 7.

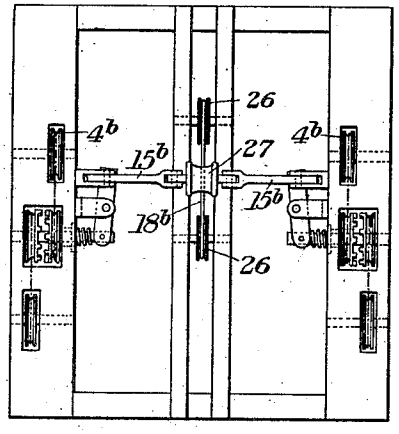
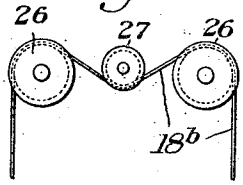


Fig. 9.



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R. A. Balderson

H. B. Blaming

INVENTOR

S. H. Miller

by Bakewell, Byrnes & Parmelee

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL H. MILLER, OF LATROBE, PENNSYLVANIA.

SAFETY DEVICE FOR ELEVATORS.

1,197,529. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed April 29, 1915. Serial No. 24,700.

To all whom it may concern:

Be it known that I, SAMUEL H. MILLER, a citizen of the United States, residing at Latrobe, Westmoreland county, Pennsylvania, have invented a new and useful Safety Device for Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of one form of my safety device shown in connection with an elevator. Fig. 2 is a diagram illustrating one set of safety cables. Fig. 3 is a detail sectional view of one form of the stop actuating mechanism. Fig. 4 is a detail sectional view of one of the safety cable sheaves. Fig. 5 is a plan view of the mechanism shown in Fig. 1. Fig. 6 is a detail sectional view on the line VI—VI of Fig. 5. Fig. 6^a is a detail sectional view illustrating the sliding frame 16 and its guys. Fig. 7 is a plan view of a modified form of mechanism. Fig. 8 is a front view of the stop or safety device actuating mechanism shown in Fig. 7, and Fig. 9 is a detail side elevation of the lifting cable sheaves and the stop mechanism actuating sheave of the device shown in Figs. 7 and 8.

This invention relates to safety devices for hoists, and is designed to provide a simple and effective safety or stop device in connection with a safety cable connected to the load, and in which there is provided a suitable device for stopping the movement of the load if the hoisting cable should part or should become unduly slack.

The object of my invention is to provide a device of this character which is controlled by means of a stop under the control of the lifting cable.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement of the parts without departing from the spirit and scope of my invention, as defined in the appended claims.

Referring to Figs. 1 to 6 of the drawings, the reference character 2 designates the usual side rails forming the guides for a car 3. In the construction shown in the drawings, I have provided two sets of safety cables, there being one set on each side of the car and elevator shaft, and as one set is a duplicate of the other, I will only describe the set on one side. 4 and 4^a are sheaves rotatably mounted at the top of the shaft, and 5 and 5^a are similar sheaves at the bottom of the shaft, the sheaves 4 and 5 being at the front of the shaft, while the sheaves 4^a and 5^a are at the back of the shaft. Loosely mounted on a shaft 6 at the top of the elevator shaft and at approximately the center thereof are sheaves 7 and 7^a; and 8 and 8^a are sheaves loosely mounted on a shaft 9 at the bottom of the shaft. 10 is a safety cable connected to the top of the car 2, and passes around the sheaves 7, 4, 5 and 8, the other end being connected to the bottom of the car, and 10^a is a similar cable connected to the car in the same manner and which passes over sheaves 7^a, 4^a, 5^a and 8^a. The cables and sheaves are so arranged that when the car 2 is moving upwardly the sheave 7 will rotate in one direction, while the sheave 7^a rotates in the reverse direction, and when the car moves downwardly the sheaves 7 and 7^a will rotate in reverse directions from that in which they rotate when the car is moving upwardly. The safety cables make approximately a turn and a quarter about their respective sheaves 7 and 7^a, to prevent the cables slipping over these sheaves, as hereinafter described; but only make approximately a quarter of a turn around the other sheaves.

The shaft 6 is slidably mounted in suitable bearings in the supporting framework, the sheave 7 being held in position on the shaft by means of collars 11 so that this sheave will be moved laterally when the shaft 6 is moved in a longitudinal direction. The sheave 7^a is not directly mounted on the shaft 6, but rotates on a sleeve 12 surrounding the shaft 6. These sheaves 7 and 7^a are provided with clutching projections 13 and 13^a, respectively, and are arranged to stop the movement of the sheaves 7 and 7^a when moved into clutching engagement, as hereinafter described. Pivotally connected to a suitable bracket 14 connected to the supporting structure is a bell crank 15, one end thereof being connected to the shaft 6, while the other end is connected to a sliding frame 16 mounted in guides 17 connected to the sheave supporting structure.

18 is the usual lifting cable connected to the top of the car, and which passes over

a sheave 19 at the top of the shaft, then over a small sheave 20 connected to the sliding frame 16, a sheave 21 on one end of a lever 22, and thence around the usual sheave 23 at the bottom of the shaft to the hoisting drum. The lever 22 is mounted in a bracket 24 connected to the supporting framework, the end opposite the sheave 7 engaging the sliding frame 16. The arrangement is such that when the load is on the lifting cable the parts will be held in the positions shown in the drawings, so that the sheaves 7 and 7^a are free to rotate. Surrounding the shaft 6 and engaging the framework and the bell crank 15 is a spring 25 which tends to move the shaft 6, together with the sheave 7, to bring its clutching members in engagement with the clutching members on the sheave 7^a. If, for any reason, the lifting cable should part or should become unduly slack, the spring 25 will immediately bring the sheaves 7 and 7^a into clutching engagement and stop the movement of the sheaves, together with the safety cables and the car.

As the operating mechanism for the shaft 6 on one side is a duplicate of that on the other, it will not be necessary to describe both of them, it being understood, however, that when the safety cables on one side of the shaft are stopped by means of the clutch device the cables on the other side will be simultaneously stopped by a similar device.

When it is desired to repair any of the parts, or adjust them, it is only necessary to lower the car onto its usual supporting springs at the bottom of the shaft, which will permit the stopping apparatus to be thrown into action, and at the same time relieve all strain on the safety cables, so that any of the parts can readily be adjusted or repaired.

In Figs. 7, 8 and 9 I have shown a modified form which is very similar to that shown in the figures already described, and in which I have used the same reference characters, with the letter "b" affixed. In this construction, the parts are the same, with the exception that the actuating bell cranks 15^b are arranged to swing about pivots at right angles to those shown in the other figures. In this case the lifting cable passes over sheaves 26 and under a sheave 27 rotatably mounted on a shaft connected to the bell cranks 15^b.

I have shown and described two safety cables for checking the movement of the car, but it will readily be understood by those familiar with the art that the device can be controlled by means of a single cable, such as the cable 10^a passing over the sheave 7^a, and in which case the clutching members thereon would engage stationary clutching members to prevent rotation of the sheave 7^a when moved into clutching engagement.

The advantages of my invention result from the provision of a safety cable or cables connected to the load being hoisted, together with a stop device controlled by the lifting cable to stop the movement of the safety cable, together with the load, if the lifting cable parts or becomes unduly slack.

I claim:

1. A safety mechanism for hoisting devices, comprising a safety cable connected to the load and arranged to be moved thereby, sheaves for said cable, a shaft for the sheave, a lifting cable connected to the load, a stop member on one of the safety cable sheaves, a second stop member arranged to coact with the stop member on the sheave to lock the sheave against rotation, one of said stop members being arranged to move relative to the other in a line parallel to the shaft and a stop actuating device controlled by the lifting cable and arranged to cause one stop member to move into locking engagement with the other stop member; substantially as described.

2. A safety device for elevators, comprising a safety cable connected to the car at both ends and arranged to be moved thereby, a sheave over which the cable passes, a clutch member connected to the sheave of the safety cable, a second clutch device adapted to coact therewith, a lifting cable connected to the car, and a clutch actuating device controlled by the lifting cable and adapted to move one of the clutch members relative to the other to stop the movement of the safety cable sheave; substantially as described.

3. A safety device for elevators, comprising a plurality of safety cables connected to the car at both ends and arranged to be moved thereby, there being one of said cables on each side of the car, sheaves for each of said cables, a clutch device connected to one of the sheaves of each of said cables, a second clutch device on one side of each of said sheaves and adapted to coact with the clutch members on the safety cable sheaves, a lifting cable connected to the car, a clutch actuating mechanism controlled by the lifting cable and arranged to move the clutching devices of the safety cables toward each other to stop the sheaves if the lifting cable parts or becomes unduly slack; substantially as described.

4. A safety device for elevators, comprising a plurality of safety cables connected to the car, a sheave for each of said cables, said sheaves and cables being so arranged that the sheaves will rotate in reverse directions, a clutch device on each of said sheaves adapted to be brought into engagement with each other, a lifting cable connected to the

car, and a clutch actuating device controlled by the lifting cable, substantially as described.

5. A safety device for elevators, comprising a plurality of safety cables on each side of the elevator shaft connected to the car and arranged to be moved thereby, a lifting cable connected to the car, a sheave for each of the safety cables, the sheaves for the cables on each side of the car being arranged to rotate in reverse directions, clutch devices on each of said sheaves, lever mechanism for moving one sheave of each set laterally relative to the other sheave, said lever mechanism including a sliding frame, springs for moving said sheaves toward each other, and an actuating device connected to the lever mechanism controlled by the safety cable for holding the clutch devices on the sheaves out of engagement with each other, substantially as described.

In testimony whereof, I have hereunto set my hand.

SAMUEL H. MILLER.

Witnesses:
JESSE B. HELLER,
H. M. CORWIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."