

C. S. MORTENSON.
ELEVATOR SAFETY DEVICE.
APPLICATION FILED MAY 16, 1912.

1,042,813.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

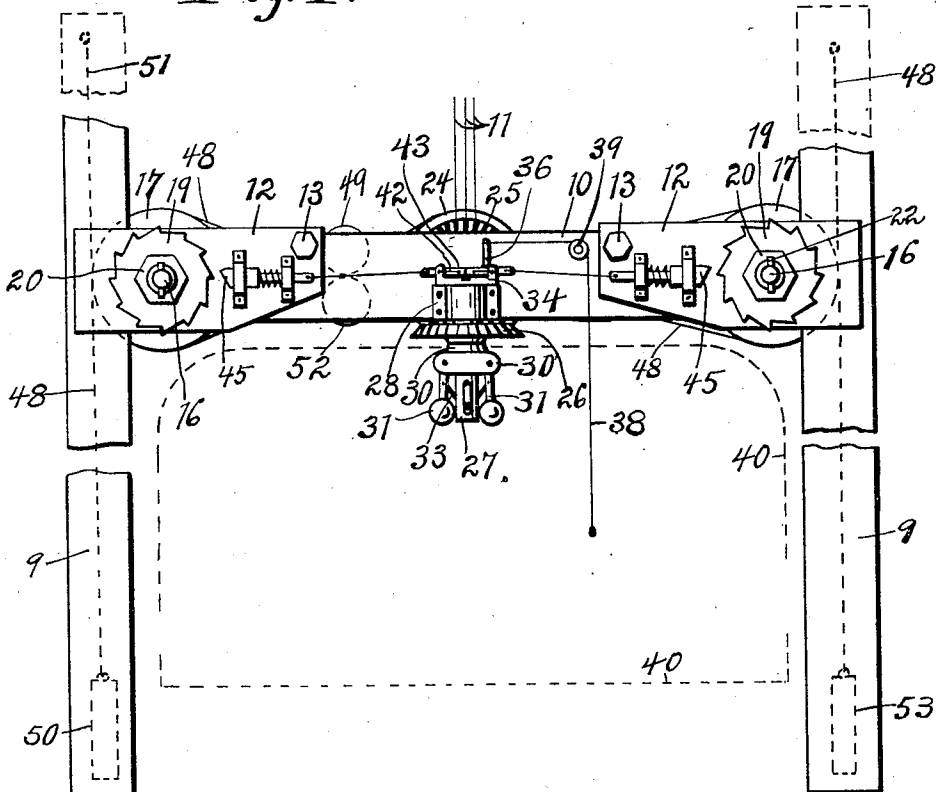
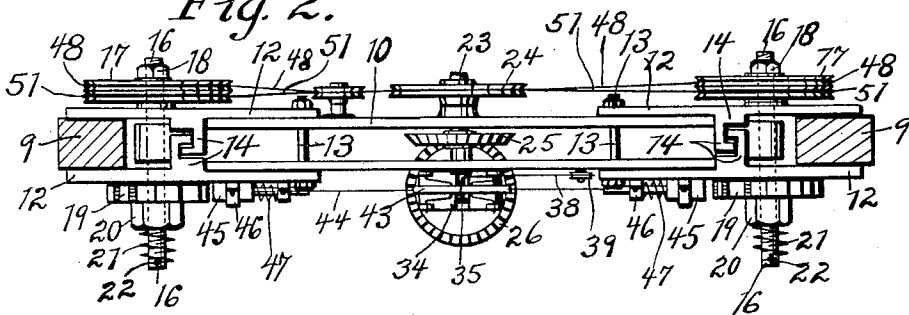


Fig. 2.



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R. W. Stone

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2 SHEETS—SHEET 2.

Fig. 3.

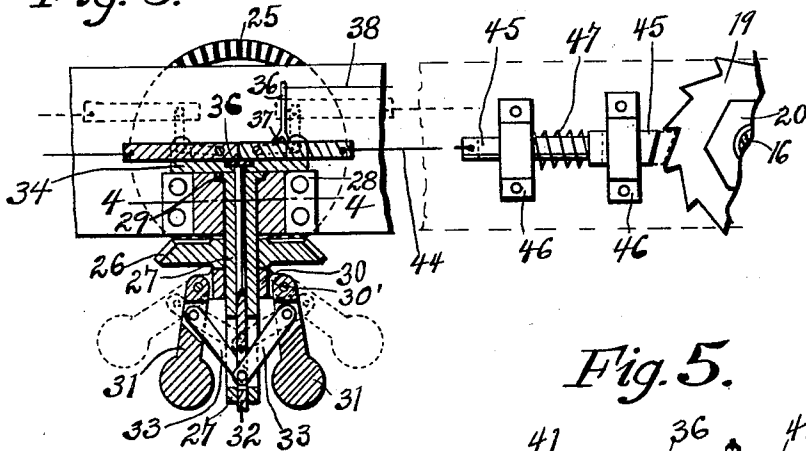


Fig. 5.

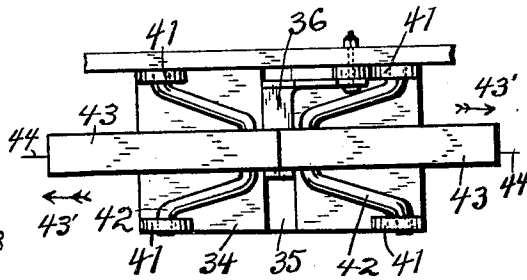


Fig. 4.

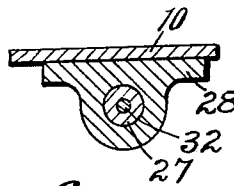


Fig. 6.

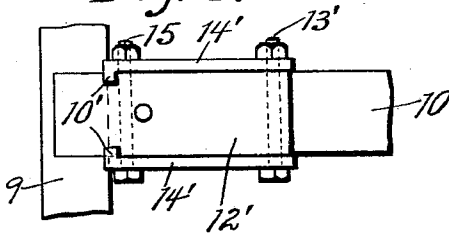


Fig. 7.

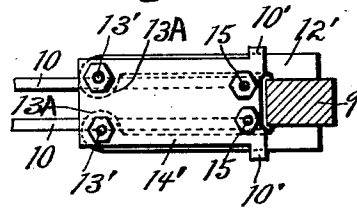
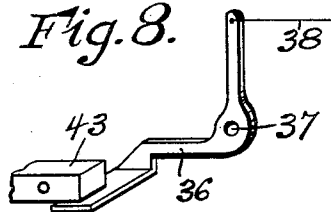


Fig. 8.



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UNITED STATES PATENT OFFICE.

CARL S. MORTENSON, OF MOLINE, ILLINOIS.

ELEVATOR SAFETY DEVICE.

1,042,813.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed May 16, 1912. Serial No. 697,817.

To all whom it may concern:

Be it known that I, CARL S. MORTENSON, formerly a subject of the King of Sweden, (who has declared his intention of becoming a citizen of the United States,) a resident of the city of Moline, county of Rock Island, and State of Illinois, have invented certain new and useful Improvements in Elevator Safety Devices, as set forth in the annexed specification.

My invention relates to elevator safety devices, and particularly to the type which will automatically arrest the falling movement of the elevator should it begin to fall, and the object of my improvement is to provide a device of this character which will be simple of construction and efficient in operation.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a side elevation of the safety appliance built in accordance with my invention, Fig. 2 is a top plan view of the same, Fig. 3 is an enlarged view of the governor and locking mechanism, Fig. 4 is a section of the same, as taken on line 4—4 in Fig. 3, Fig. 5 is a plan view of the locking mechanism, Fig. 6 is a modified form of the locking jaws, Fig. 7 is a plan view of one pair of the modified form of locking jaws, and Fig. 8 is a view, in perspective, of the manual unlocking means.

The preferred form of construction, as illustrated in the drawings comprises the conventional guide rails 9 of an elevator shaft, having a guide rail on each side of the car. Between said guide rails is supported the beam 10 by means of the conventional cables 11. At the ends of the beam 10 are pivotally secured the clamping jaws 12, as at 13 which are adapted to serve as guides, when the elevator is running normally. In the preferred form, these jaws are provided with wings 14 on the top and bottom portions to prevent them from revolving vertically on bolt 13, and said wings 14 are provided with locking hooks, as indicated in Fig. 2, to limit their opening movement so that they will open sufficiently to allow the inner sides of said jaws to serve as guiding means for the beam 10 on the guides 9.

The modified form of construction as illustrated in Figs. 6 and 7 comprises plates 14' having hooked corners 10' at their ends near the guide rails 9 and the jaws 12' are provided with ears 13^A and pivoted on bolts 13' to swing laterally thereon, the plate 14' serving to prevent vertical rotative movement of the clamping jaws 12'. The ends of the plates 14' are further supported by means of bolts 15 passing vertically there-through.

The jaws 12 are provided with holes registering with suitable bearings in the ends of beams 10 and shafts 16 journaled therein. On one end of each of the shafts 16 are secured double-grooved faced pulleys 17 rigidly secured thereon by means of nuts 18. The other ends of said shafts 16 are provided with threads and the ratchet wheels 19 are threaded thereon. Said ratchet wheels are provided with nut hub portions 20 so that they may be unscrewed to open the jaws 12 after having been clamped on the guides 9. The ratchet wheels 19 are caused to rotate on the shaft 16 by means of a tension spring 21 positioned on said shaft between the hub portion 20 and a pin 22 so that when the elevator is running normally the ratchet wheels will turn with said shafts.

Near the central portion of the beam 10 is journaled a shaft 23, on which is secured a grooved pulley 24 and a bevel gear 25, and such bevel gear 25 is meshed with a gear 26 which is secured on the shaft 27. Said shaft 27 is journaled in a bearing 28 which is secured to the beam 10. Said shaft 27 is provided with an enlarged head portion 29 to prevent longitudinal movement of such shaft. Also, rigidly secured on said shaft is the hub 30 having ears 30' to which are pivoted the weighted arms 31 of the governor. Said shaft 27 is provided with an axial bore into which is slidably mounted the small shaft 32 and said shaft 32 is connected to the weighted arms 31 by means of connecting rods 33 in a manner to cause the shaft 32 to move longitudinally in the portion of the shaft 27 as the weighted arms 31 are inclined.

A supporting member 34 is secured on the beam 10 in proximity with the bearing 28 and provided with a perforation through which the shaft 32 protrudes. Said supporting member 34 is provided with a slot 35 in which the extended arm of the bell crank lever 36 normally rests. Said bell

crank lever 36 is pivoted, as at 37, on said beam 10 and a cord 38 which extends around a suitable pulley 39 and into the car 40 in a suitable position for the operator to manually operate said bell crank lever. Said supporting member 34 is provided with ears 41, into which are journaled the outer ends of the U-shaped arms 42 and the locking members 43 are provided on the central portions of said U-shaped members 42 in a manner to abut the ends over the extended arm of the bell crank lever 36. The pivotal points through which the central portions of the U-shaped members 42 are positioned are slightly lower than the pivotal points in the ears 41 so that force exerted on the locking members 43 in the directions of the arrows 43' in Fig. 5 will cause such locking members to be locked against the upper surface of the supporting member 34.

Cords 44 are connected with locking members 43 and the sliding pawls 45 which are mounted in slidable bearings 46 secured to the beam 10 and such sliding pawls 45 are provided with compression springs 47 to move them into engagement with the ratchets 19 upon being unlocked.

A cable or cord 48 is secured near the top of one of the guides 9, runs downwardly under one of the pulleys 17 across the beam 10 to and over the pulley 24, under the pulley 49 and over the other pulley 17 and downwardly to near the bottom of the opposite guide 9 and is held in tension by means of a weight 50. A similar cable or cord 51 is passed under the other of said pulleys 17 over the pulley 52, under the pulley 24 and over the pulley 17 then downwardly over the first guide 9 to near its bottom portion where a weight 53 is secured to maintain said cable or cord in tension.

In operation the jaws 12 serve as guide members for the beam 10 and the cables or cords 48 and 51 pass over the pulleys as already described thereby imparting motion to the governor and at normal speeds the governor does not effect the unlocking means for the pawls 45 but instantly upon the elevator beginning high speed or falling the governor will be driven faster thereby causing greater inclination of the arms 31 which in turn will raise the shaft 32, the extended end of the bell crank lever 36 and the locking members 43 and as soon as the pivotal points in the locking members 43 swing to positions above the pivotal points 41 of the ends of the U-shaped members 42 the springs 47 will cause the locking members and the U-shaped arms to take substantially the positions indicated by their dotted lines in Fig. 3 and the pawls 45 will be forced into engagement with the ratchets 19 which will arrest their rotation thereby causing them to bind the jaws 12, clamping the guides 9 to bring the elevator car to a stop.

The manually operative bell crank lever 36 is provided with the cord 38, so that the operator may, when so desired, trip the unlocking means and allow the pawls 45 to be thrown into engagement with the ratchet wheels 19 to stop the car as already described.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A device of the kind described comprising vertical guides; a beam extending between said guides; a car supported by said beam; clamping jaws on said beam adapted to clamp said vertical guides; locks engaging said jaws to limit their openings; shafts passed through said jaws and journaled in the end portions of said beam; a pulley secured on one end of each of said shafts; threads on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; means for rotating said pulleys, shafts and ratchet wheels; and means for arresting the rotation of said ratchet wheels, substantially as described.

2. A device of the kind described comprising vertical guides; a beam extending between said guides; a car supported by said beam; clamping jaws on said beam adapted to clamp said vertical guides; locks engaging said jaws to limit their openings; shafts passed through said jaws and journaled in the end portions of said beam; a pulley secured on one end of each of said shafts; threads on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; means for rotating said pulleys, shafts and ratchet wheels; spring actuated pawls on said beam adapted to arrest the rotation of said ratchet wheels; locks for locking said pawls out of engagement with said ratchet wheels; and means for unlocking said pawls, substantially as described.

3. A device of the kind described comprising vertical guides; a beam extending between said guides; a car supported by said beam; clamping jaws on said beam adapted to clamp said vertical guides; locks engaging said jaws to limit their openings; shafts passed through said jaws and journaled in the end portions of said beam; a pulley secured on one end of each of said shafts; threads on the other end of each of said

shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and near the bottom of said other vertical guide; and means for arresting the rotation of said ratchet wheels, substantially as described.

4. A device of the kind described comprising vertical guides; a beam extending between said guides; a car supported by said beam; clamping jaws on said beam adapted to clamp said vertical guides; locks engaging said jaws to limit their openings; shafts passed through said jaws and journaled in the end portions of said beam, each of said shafts being provided with threads on one of its ends; a pulley secured on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and to near the bottom of said other vertical guide; spring actuated pawls on said beam adapted to arrest the rotation of said ratchet wheels; locks for locking said pawls out of engagement with said ratchet wheels; and means for manually unlocking said locks, substantially as described.

5. A device of the kind described comprising vertical guides; a beam extending between said vertical guides; a car supported by said beam; clamping jaws on said beam and adapted to clamp said vertical guides; locks limiting the openings of said jaws; shafts passed through said jaws and journaled in the end portions of said beam, each shaft being provided with threads on one of its ends; a pulley secured on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and downwardly to near the lower end of the other of said vertical guides; spring actuated pawls on said beam to cooperate with said ratchet wheels; locks locking said pawls out of engagement with said ratchets; and manually operative means for unlocking said locks, substantially as described.

6. A device of the kind described comprising vertical guides; a beam extending between said vertical guides; a car supported by said beam; clamping jaws on said beam and adapted to clamp said vertical guides; locks limiting the openings of said jaws; shafts passed through said jaws and journaled in the end portions of said beam,

each of said shafts being provided with threads on one of its ends; a pulley secured on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and downwardly to near the lower end of the other of said vertical guides; spring actuated pawls on said beam to cooperate with said ratchet wheels; locks locking said pawls out of engagement with said ratchets; a governor on said beam operatively connected with said tensioned cables; and an unlocking means connected with said governor to automatically unlock said locks, substantially as described.

7. A device of the kind described comprising vertical guides; a beam extending between said vertical guides; a car supported by said beam; clamping jaws on said beam and adapted to clamp said vertical guides; locks limiting the openings of said jaws; shafts passed through said jaws and journaled in the end portions of said beam, each shaft being provided with threads on one of its ends; a pulley secured on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and downwardly to near the lower end of the other of said vertical guides; spring actuated pawls on said beam to cooperate with said ratchet wheels; locks for locking said pawls out of engagement with said ratchets; a governor on said beam operatively connected with said tensioned cables; a supporting member on said beam; U-shaped arms pivoted on said supporting member; locking members pivoted on said U-shaped arms in a manner to be unlocked by said governor; and cords connecting said locking members with said pawls, substantially as described.

8. A device of the kind described comprising vertical guides; a beam extending between said vertical guides; a car supported by said beam; clamping jaws on said beam and adapted to clamp said vertical guides; locks limiting the openings of said jaws; shafts passed through said jaws and journaled in the end portions of said beam, each shaft being provided with threads on one of its ends; a pulley secured on the other end of each of said shafts; ratchet wheels threaded on the threaded ends of said shafts; a tensioned cable secured near the top of each of said vertical guides, passed downwardly and around one of said pulleys, across to and around the other of said pulleys and downwardly to near the

lower end of the other of said vertical guides; spring actuated pawls on said beam to coöperate with said ratchet wheels; locks for locking said pawls out of engagement
5 with said ratchets; a supporting member on said beam; U-shaped arms pivoted on said supporting member; locking members pivoted on said U-shaped arms in a manner to lock said pawls out of engagement with said
10 ratchet wheels; and a bell crank lever pivoted on said supporting member, having one

arm extended and interposed under said locking members to manually unlock said locking members, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL S. MORTENSON.

Witnesses:

FRED H. McCORKEL,
JOHN MARTINSON.

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