No. 676,831. Patented June 18, 1901.

H. M. YOUNG.

SAFETY DEVICE FOR ELEVATORS.

(Application filed Nov. 22, 1899. Renewed Mar. 21, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1

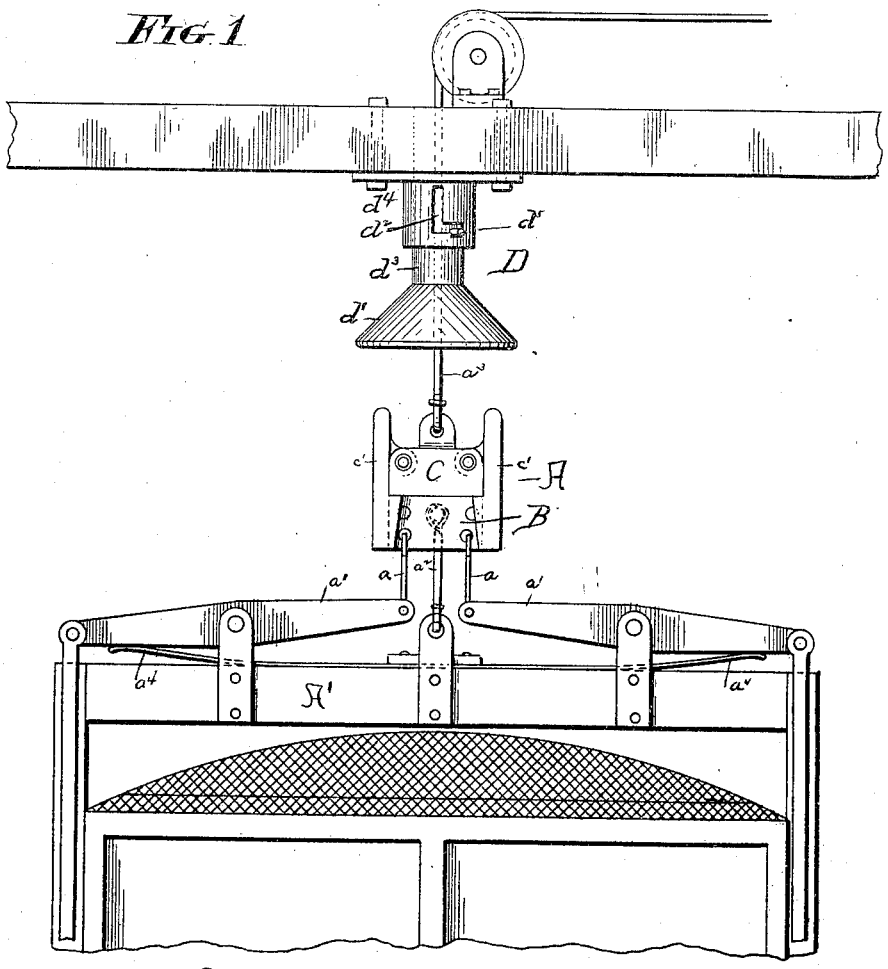

FIG. 3

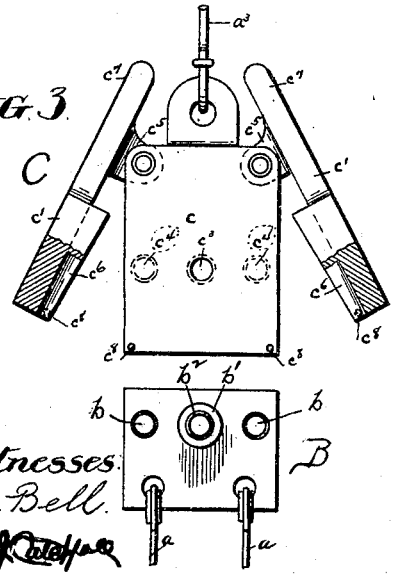

FIG. 4

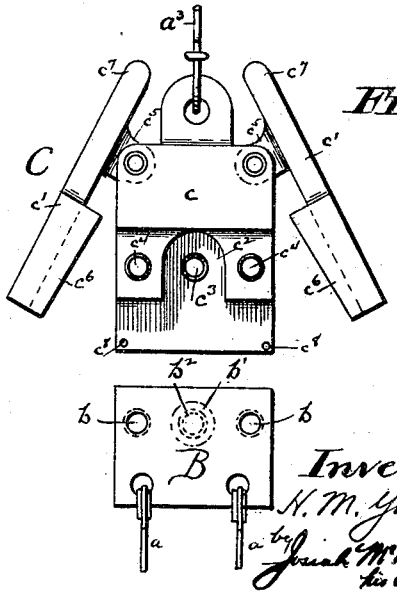

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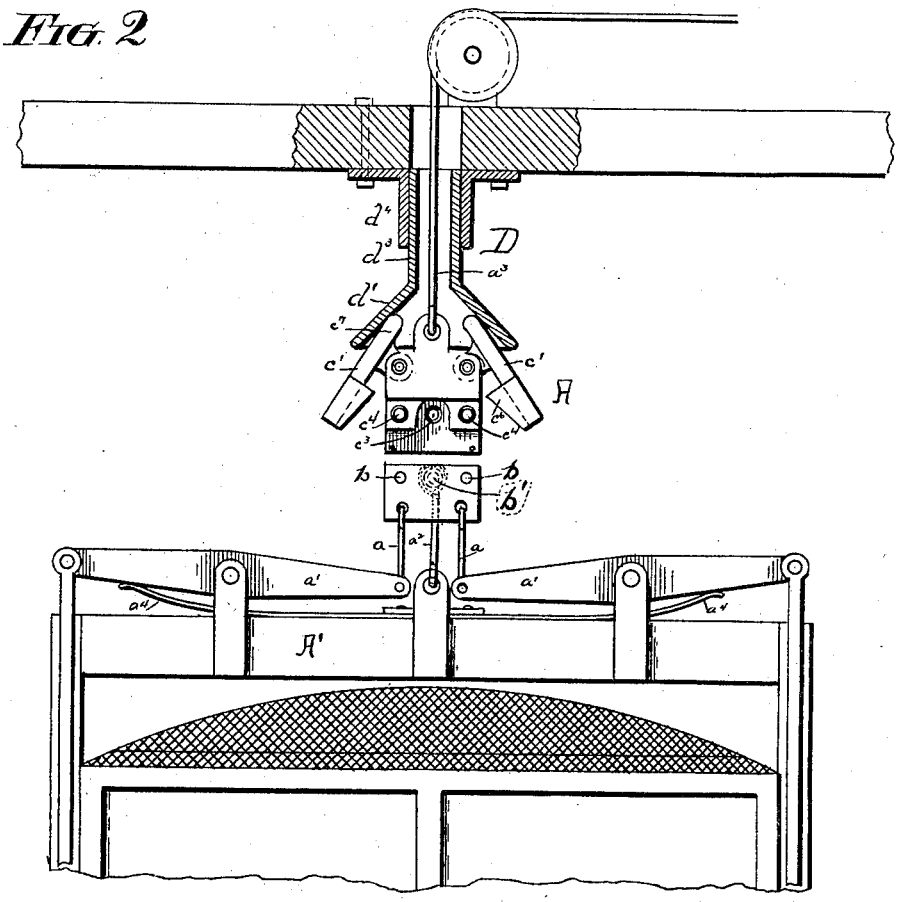
FIG. 2



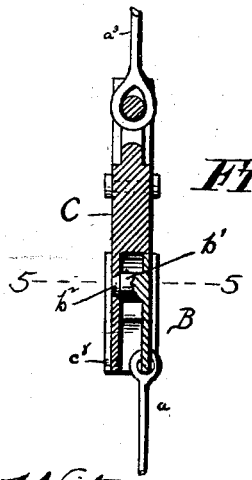


FIG. 6

FIG. 7

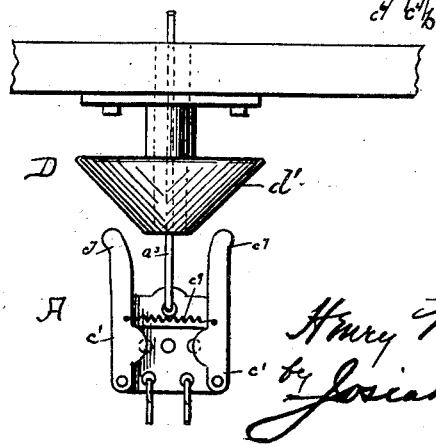
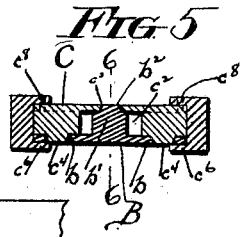


FIG. 5



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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 676,831, dated June 18, 1901.

Application filed November 22, 1899. Renewed March 21, 1901. Serial No. 52,270. (No model.)

To all whom it may concern:

Be it known that I, HENRY MASON YOUNG, a citizen of the United States, residing at St. Charles, Illinois, have invented certain new and useful Improvements in Safety Devices for Elevators; and I do hereby declare the following to be such a full, true, and exact specification thereof as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to safety devices for elevators, and particularly to devices adapted to release or detach the car from the winding cables by which it is suspended when it passes upwardly beyond the limit of its normal travel.

The object of the invention is to provide a suitable and efficient detaching means to prevent the car from overrunning its normal path of travel in an upwardly direction and to obviate the danger of its coming in contact with the cross-tree at the top of the shaft which carries the cable-sheaves and carrying away the working parts at that point, as often results when the mechanism becomes unmanageable. These objects I accomplish by suitable means which automatically release or detach the car from the winding cables at a predetermined point of its travel, one exemplification of which is shown in the accompanying drawings and set forth in this specification.

In the drawings forming a part of this specification, Figure 1 is a front elevation of the parts in their normal positions and relations; Fig. 2, a sectional elevation showing the coupler at the moment of disengagement by the uncoupling device; Figs. 3 and 4, front and rear views, respectively, of the parts of the coupler when disconnected. Figs. 5 and 6 are sectional views of the coupler, and Fig. 7 a modification of the coupler and uncoupler.

The release device comprises a coupler or clutch composed of two parts, which are normally connected together and connected, respectively, to the winding cables a^3 and to the car, and an uncoupler or disconnecting device located at the top of the well slightly beyond the normal travel of the car and adapted to open the clutch or coupler, so that the car may be detached from the winding cables before coming into contact with the cross-tree which supports the sheaves or pulleys. The stop devices to prevent the car from dropping are also connected to the coupler, so as to be operated automatically by the disconnection of its parts.

The principle of my invention may be embodied in various forms; but for convenience of operation and simplicity of construction I prefer the exemplification herein disclosed, it being apparent that various applications of the principle involved may be employed without departing from my invention. In the form herein shown and described the supplemental part B of the coupler or clutch A is preferably a flat metallic plate having a perforation b near each upper corner and provided with a post b' upon its rear face. This post forms a convenient means for attaching the cable or cables a^2, which connect the plate and the car, though other attaching means may be employed. The plate is provided upon its rear face with a conical pin b^2 for a purpose to be fully described, and in the exemplification shown this pin is constituted of the reduced and beveled end of the post b' as a convenient construction. The plate may be provided with means to attach the cables a, by which the plate and stop devices hereinafter set forth are connected, such means being here shown merely as perforations. The perforations b are preferably slightly conical, being reduced toward the rear of the plate.

The main part C of the coupler or clutch is composed of a body portion c and the wings c' pivoted thereto. The body is preferably reduced in cross-section near its lower end for a purpose to be presently described and is provided with a seat c^2 in its rear face to receive the post b' of the supplemental part B and with a perforation c^3 for the conical pin b^2 thereof. Two conical studs or pins c^4 project from the rear face of the body, and the wings c' are pivoted to the body by means of suitable pintles or cross-pins passing through the body at the upper corners, where it is cut away to receive the ears c^5, preferably as shown in Figs. 3 and 4. The wings

are provided with flanges c^6, which embrace and take over the edges of the main and supplemental parts of the coupler when the latter are assembled, as clearly shown in Fig. 5, and their upper ends extend some distance above the body portion, as shown at c^7, in order to come in contact with the cam-faces of the uncoupler, as fully hereinafter described. The upper end of the body is provided with any suitable means for attaching the winding cables.

An uncoupling device is secured, preferably, to the cross-tree at the top of the shaft immediately below the sheaves, over which the cables run, and is of a suitable form to act upon the extensions c^7 of the wings, so as to throw the wings out of engagement with the parts of the coupler. The uncoupler D is preferably in the form of a cone, and its arrangement is varied according to the arrangement of the wings of the coupler. When the wings are pivoted to the upper portion of the body of the coupler, as shown in Figs. 3 and 4, the uncoupler D is preferably in the form of a hollow cone d', as shown in Figs. 1 and 2, this being the preferred arrangement. However, when the wings are pivoted to the lower portion of the body the coupler is in the form of an inverted cone d', as shown in Fig. 7. The cone is preferably supported in either case upon a depending circular support, to which it is movably connected by any suitable means, such as the bayonet-joint d^2.

The car may be provided with any suitable device to prevent it from dropping, controlled by its accelerated motion, and in the drawings a' represents two spring-controlled levers pivoted upon the cross-bar A′ of the car and connected to the supplemental plate B of the coupler by the cables a and to the stop devices, usually located beneath the car, in any well-known manner, so that when the stop-levers a' are released from the strain of the cables a the springs a^4 thereof will instantly operate the stop devices through suitable connections to prevent the car from dropping. The stop devices are not herein shown, being of any of the well-known forms—such, for example, as shown in Patent No. 568,521, granted September 29, 1896, to A. R. Clarke—and being operated by suitable connections from the stop-levers a' in a manner well understood in the art.

In assembling the parts the lower plate is connected to the car by the cable or cables a^2, passing from the cross-bar A′, it being understood that any number of cables may be employed and that the plate may have any number of devices to which they may be fastened, the single post b' of the drawings being for mere simplicity of illustration. The main plate C of the coupler is connected to the winding cables a^3 and the two parts of the clutch or coupler are then connected together as follows: The post b' of the plate B is inserted in the seat c^2 of the plate C, the pin b^2 passing through the perforation c^3, and the studs c^4 in turn passing through the perforations b of the plate B. The wings c' are then closed, their flanges c^6 embracing the edges of the plates of the coupler and locking or retaining them together against displacement, whereby the winding cables and car are securely connected in a detachable manner.

In order to insure the retention of the wings in position and prevent their accidental displacement, a soft-metal pin may be passed through one flange of each of the wings and the front plate of the coupler, as at c^8, the cutting away of the body of the main plate permitting this to be readily accomplished. As is apparent, these pins will be sheared by the flanges to release the wings when the latter are operated by the uncoupler to permit the disconnection of the two parts of the coupler, as now to be described.

When the parts are in their normal positions, the car is securely coupled to its winding cables a^3, the two parts of the coupler being securely held together by the connecting means or pins and perforations and by the retaining means or wings, these several elements coacting as the coupling means, and this condition exists as long as the car remains within its normal path of travel. When, however, from any cause the operating mechanism of the cables becomes unmanageable and the car overruns its normal upward position in the shaft, the extensions c^7 of the wings will contact with the inclined faces of the uncoupler D, and the wings thereby will be thrown laterally out of the position which they normally occupy, locking or retaining the two parts of the coupler together. The position of the parts when this takes place is clearly illustrated in Fig. 2, and the two parts of the coupler will then be separated, the conical arrangement of the connecting-pins and perforations permitting this to be readily accomplished under the stress of the weight of the car suspended from the lower plate. The distance between the car and coupler may be readily adjusted so as to avoid all possibility of the car striking the uncoupling device D and the cross-tree to which it is secured, the length of the cables a being such that the coupler is disconnected before the car comes in dangerous proximity to the cross-tree. Immediately upon the release of the lower plate B from the lifting tendency of the winding cables the small cables a, extending from the plate B to the levers a' of the stop device, become slack, permitting the springs a^4 of these levers to instantly throw them to position to operate the stop devices and hold the car against dropping. When it is desired to again connect the two parts of the coupler, the part C may be lowered from its position with relation to the uncoupler D or the uncoupler may be raised up out of position to release the part C, the bayonet-joint d^2 permitting such movement.

In the form shown in Fig. 7 the arrangement

of the parts is merely reversed, the wings being pivoted to the lower corners of the plate C and held by suitable means, as a spring c^9, and contacting with an inverted cone.

It will be noted that the uncoupler D is made in two parts, the contact portion d' having a sleeve d^3 telescoping and sliding within the depending supplementary portion d^4, to which it is adjustably secured by the bayonet-joint d^2. The pin d^5 of the sleeve normally rests in the lateral portion of the slot of the joint and is preferably of soft metal. Hence when the coupler is projected against the cone of the uncoupler and the wings thereby thrown to permit the parts of the coupler to disengage any continued and heavy strain upon the parts—as, for example, such as would be produced by the piston not yet being at the end of its stroke—will result in the pin b^5 being sheared off by the sleeve of the cone to permit the cup of the cone to be raised far enough to allow the piston to reach the end of its stroke before the cone contacts with the cross-head. In practice the length of the vertical portion of the slot in the sleeve is sufficient to insure the piston reaching the end of its stroke before the cone reaches the limit of its upward movement to release the wings of the coupler, and if the pin is sheared the piston likewise reaches the limit of its movement before the cone reaches a position to endanger the cross-head and upper works.

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

1. A release mechanism for elevators comprising a coupler consisting of two separable plates connected respectively to the cable and car, means to normally connect the plates, means to retain them in connected position, and an uncoupling device adapted to release the retaining means.

2. A detaching mechanism for elevators comprising a coupler consisting of two plates connected respectively to the cable and car, means normally connecting the plates, pivoted wings having flanges, and an uncoupler adapted to throw the wings.

3. A release mechanism for elevators comprising a clutch composed of two plates, conical pins on one engaging perforations in the other, wings to retain the plates in position, and means to throw the wings.

4. A release mechanism for elevators composed of a plate connected to the winding cables, a second plate connected by cables to the car, conical pins connecting the plates, means to retain the plates normally in position, and means to operate the retaining means.

5. A release mechanism for elevators composed of two plates, one connected to the winding cables and the other to the car, conical pins connecting the plates, wings pivoted upon one plate and having flanges to embrace both plates when assembled and extensions projecting above the plates, and a cone for throwing the wings.

6. The combination with winding cables, and a car provided with stop-levers, of a two-part coupler, one part whereof is attached to the cables and the other part to the car and stop-levers, and means to disconnect the parts of the coupler.

7. The combination with winding cables, and a car provided with stop-levers, of a coupler composed of two plates, one plate being connected to the cables, flexible connections between the second plate and the car and stop-levers, and an uncoupling device.

8. The combination with winding cables, and a car provided with spring-levers adapted to operate suitable stop devices, of a two-part coupler, one part whereof is connected to said cables and the other to said car and levers by flexible connections, and means to disconnect the parts of the coupler.

9. The combination with a car, winding cables, and a coupler therefor, of an uncoupler consisting of a depending member and a conical member united by a soft-metal pin.

10. The combination with a car, winding cables, and a coupler therefor, of an uncoupler consisting of a member composed of a cone and sleeve, and a supporting member to which the sleeve is connected by a bayonet-joint having a soft-metal pin.

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

HENRY MASON YOUNG.

Witnesses:
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J. MCROBERTS.