

[54] **CAGE GATE LOCK MECHANISMS**
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1,047,977 11/1966 **Great Britain**.....187/61
 79,057 12/1930 **Sweden**.....187/61
 418,561 2/1967 **Switzerland**.....187/61

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[52] **U.S. Cl.**.....187/61
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 [58] **Field of Search**107/57, 58, 59, 61

[56] **References Cited**

UNITED STATES PATENTS

2,566,411 9/1951 **Guilbert**.....187/57
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[57] **ABSTRACT**

A gate lock mechanism for the cage of a hoist, said mechanism comprising a latch member arranged to normally engage a gate of the cage to prevent opening of said gate and pivotally mounted on a fixed axis, an operating member also mounted on said axis and arranged to move said latch member into and out of engagement with the gate and means for preventing the latch member from being moved out of engagement with the gate when a cage on which said mechanism is mounted is not opposite a landing of the hoist, said preventing means comprising a first lever pivotally mounted at one end on said fixed axis and a second lever pivotally mounted at the other end of the first lever, the arrangement being such that when the cage is not opposite a landing and the operating member is actuated, the second lever is engageable with a stop to prevent further movement of said operating member and ensure that the latch member remains in a position in which it prevents the gate from being opened.

4 Claims, 5 Drawing Figures

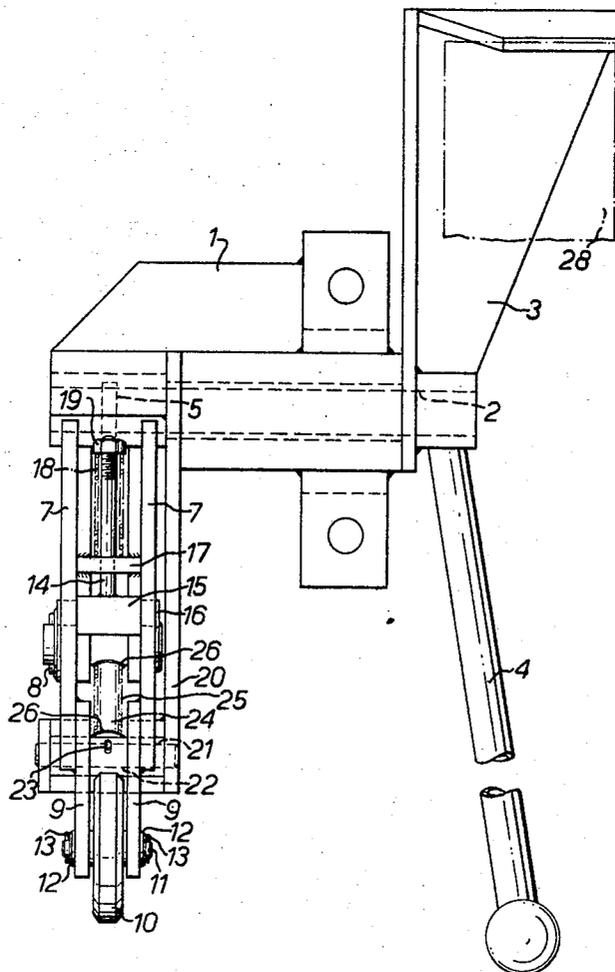
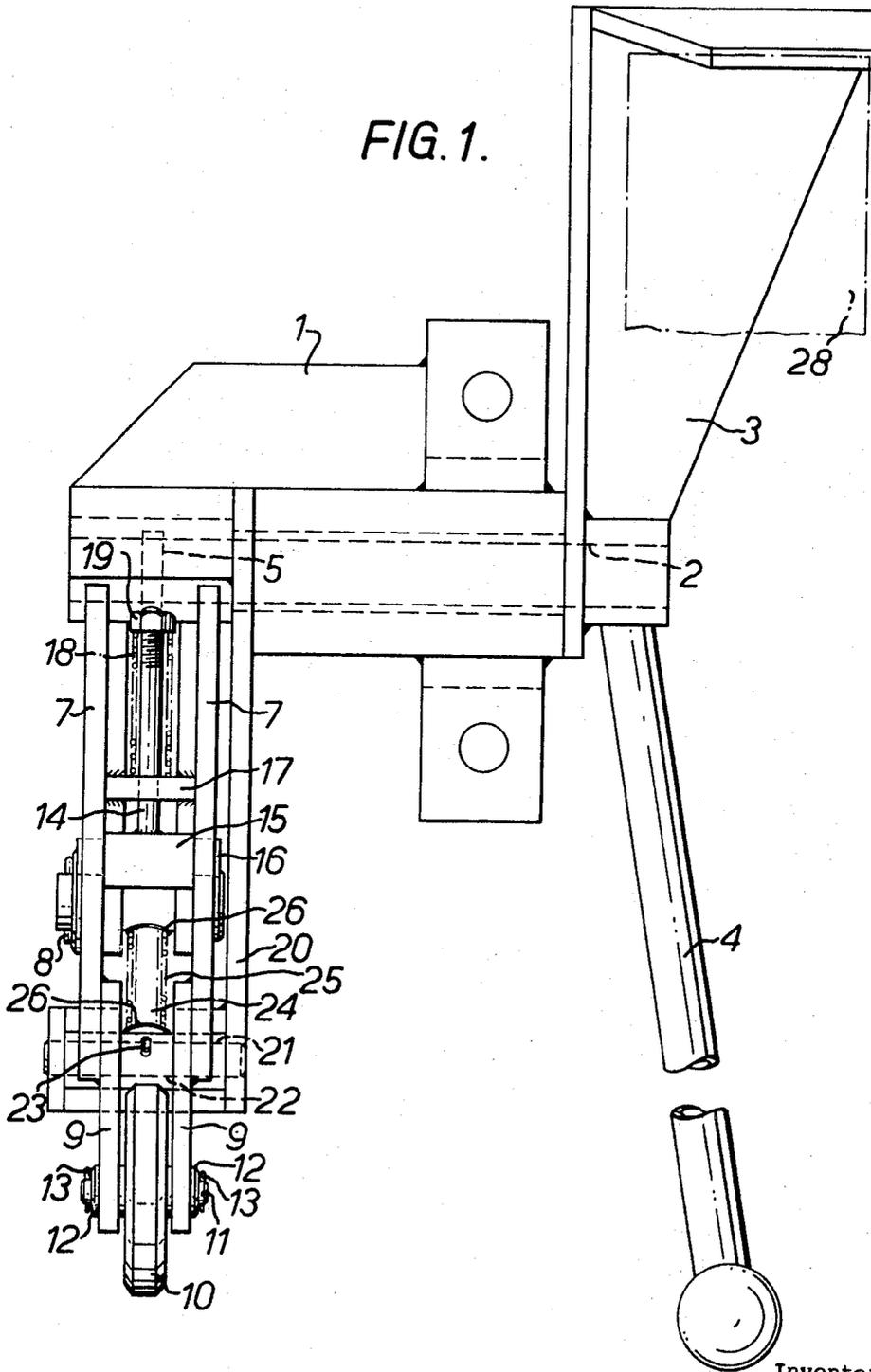


FIG. 1.



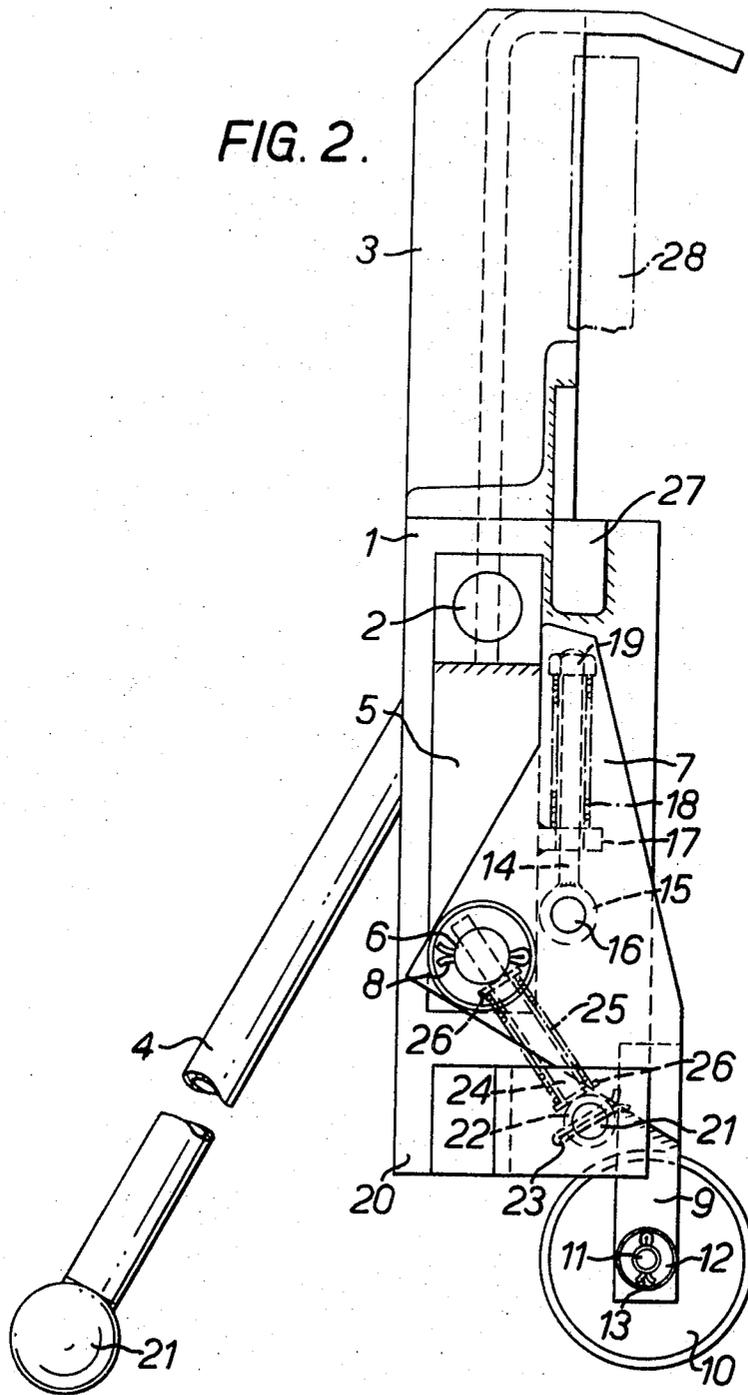
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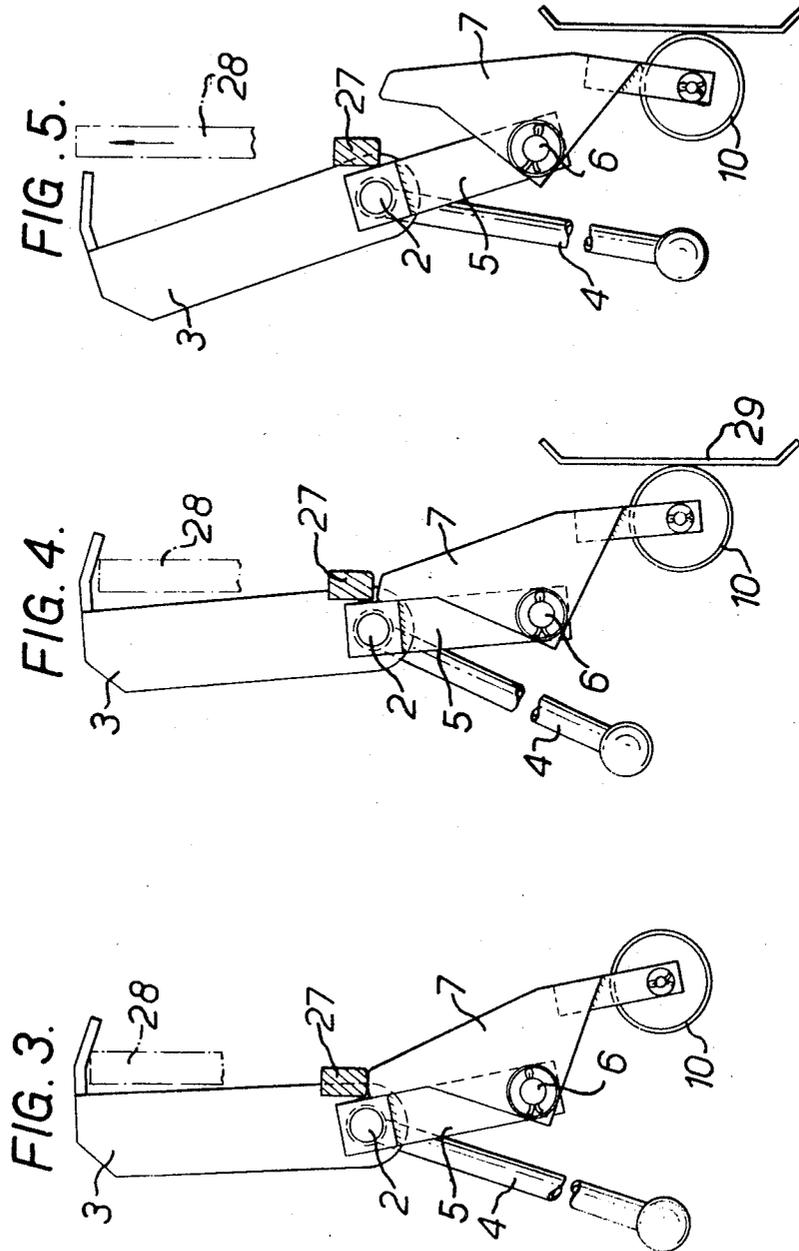
FIG. 2.



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CAGE GATE LOCK MECHANISMS

This invention relates to hoists of the kind used on building sites in which a cage is mounted in a tower and is movable between a number of landings provided on the tower. The invention is particularly concerned with locking mechanisms for the gates of cages used in such hoists.

Gate lock mechanisms for the cages of hoist are known which prevent the opening of a cage gate when the cage is not opposite a landing of the hoist. Prior gate lock mechanisms have included a follower on the cage co-operating with a ramp at each landing the follower normally being biased out of the plane of the ramps and being linked to a locking member through a double pivoted link which rotates about one pivot under the action of an operating member to bring the follower into the plane of the ramps and which rotates about the second pivot by reaction when the follower contacts a ramp to release the locking member. Such a lock mechanism is described in British Pat. No. 1,047,977, wherein the locking member is in the form of a bar held by its own weight over a beak on the gate and the moment of the bar prevents rotation about the second pivot when the follower does not contact a ramp.

The known gate lock mechanisms have however been unnecessarily complicated and involved a large number of levers and linkages and the present invention aims to provide a gate lock mechanism which is simpler and more efficient in operation.

According to the invention, there is provided a gate lock mechanism for the cage of a hoist, said mechanism comprising a latch member arranged to normally engage a gate of the cage to prevent opening of said gate and pivotally mounted on a fixed axis, an operating member also mounted on said axis and arranged to move said latch member into and out of engagement with the gate and means for preventing the latch member from being moved out of engagement with the gate when a cage on which said mechanism is mounted is not opposite a landing of the hoist, said preventing means comprising a first lever pivotally mounted at one end on said fixed axis and a second lever pivotally mounted at the other end of the first lever, the arrangement being such that when the cage is not opposite a landing and the operating member is actuated, the second lever is engageable with a stop to prevent further movement of said operating member and ensure that the latch member remains in a position in which it prevents the gate from being opened.

Preferably, the second lever carries a follower engageable with a ramp when the cage is opposite a landing and the operating member is actuated, said follower then being effective to cause said second lever to pivot with respect to said first lever whereby the second lever is moved to a position in which it is clear of the stop so that the operating member is effective to move the latch member clear of the gate to permit said gate to be opened. The follower may take the form of a wheel or roller and a spring is preferably provided to urge the follower outwardly with respect to the cage.

The gate lock mechanism according to the present invention may also be provided with a spring acting between said first and second levers and effective to urge the second lever against the stop on operation of said mechanism when the cage is not opposite a landing.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a front elevation of one embodiment of a gate lock mechanism according to the present invention;

FIG. 2 is a side elevation of the gate lock mechanism illustrated in FIG. 1; and

FIGS. 3 to 5 show diagrammatically the various operating positions of the gate lock mechanism illustrated in FIGS. 1 and 2.

Referring first to FIGS. 1 and 2, the gate lock mechanism comprises a body 1 adapted to be secured to the frame of a cage to be fitted with the gate lock mechanism according to

this invention. A shaft 2 is pivotally received in the body 1 and carries at one end a latch member in the form of a locking plate 3 and an operating handle 4.

One end of a lever 5 is mounted on the other end of the shaft 2 and the other end of the lever carries a pivot pin 6. A pair of locking plates 7 are pivotally mounted on the pin 6 and are retained on said pin by burring over one end of the pin and passing a split pin 8 through the other end of the pin. The plates 7 are each provided with an extension member 9 and a wheel 10 is mounted on a shaft 11 passing through the members 9 and held in place by a pair of washers 12 and split pins 13.

A rod 14 is secured to a sleeve 15 which is pivotally mounted on a shaft 16 extending between the plates 7. The rod 14 passes through an aperture in a bracket 17 provided on the lever 5 and a spring 18 fits over the rod. The spring 18 bears at one end against bracket 17 and at the other end against a nut 19 provided on the end of the rod which end is screw-threaded to receive the nut.

The body 1 is provided with an extension member 20 carrying at its end a pivotal shaft 21. A sleeve 22 is mounted on the shaft 21 and is secured for rotation therewith by means of a split pin 23. A rod 24 carrying a spring 25 is secured to the sleeve 22 and passes through a cross bore in the pin 6. Washers 26 are provided at each end of the spring 25 one of which bears against the pin 6 and the other of which bears against the sleeve 22. The spring 25 serves to urge the wheel 10 away from the body 1 and hence away from the cage. The body extension 20 is also provided with a lug 27 which acts as a stop for the purpose to be hereinafter described.

FIGS. 1 and 2 show the gate lock mechanism according to this invention in the position in which the mechanism is arranged to lock a gate 28 in the closed position. The locking mechanism may be moved to allow the gate to be opened by moving the handle 4 in an anticlockwise direction as viewed in FIG. 2. What happens next depends on whether the cage is opposite a landing of the hoist.

If the cage is not opposite a landing when the handle is moved, the lever 5 also pivots in an anticlockwise direction and causes the plates 7 to pivot likewise until they come into contact with the stop 27. The spring 18 serves to urge the plates 7 against this stop. This position is shown in FIG. 3 where it will be seen that the locking plate 3 is still in a position to prevent the gate 28 from being opened.

If, on the other hand, the cage is opposite a landing when the handle is operated, the lever 5 and plates 7 pivot anticlockwise through a small angle until the wheel 10 contacts a ramp 29 as shown in FIG. 4. Such a ramp is provided at each landing of the hoist. Further pivoting of the handle 4 and hence the lever 5 with the wheel 10 engaging ramp 29 causes the plates 7 to pivot about the pivot pin 6 in a clockwise direction so that the plates are moved clear of the stop 27 and the handle 4 may be operated fully to move the locking plate 3 clear of the gate 28 so that the gate can be opened. The positions of the component parts of the mechanism when this occurs are illustrated in FIG. 5.

The springs 18 and 25 ensure that when the handle is returned to its former position, the various components of the mechanism assume the positions indicated in FIGS. 1 and 2.

The gate is so arranged that the locking mechanism cannot be reset until the gate has been returned to its closed position. The gate preferably takes the form of a vertical rise and fall gate but other types of gate are also envisaged.

The cage is preferably provided with an electric switch which is closed only when the gate lock mechanism is engaged. This ensures that the cage can only be operated when the gate is locked.

I claim:

1. In a gate lock mechanism for the cage of a hoist having a gate capable of being opened when it is at a landing having a projecting fixed ramp, a latch member pivoted about a fixed axis on said cage adapted for movement between a first position of latching association with said gate and a second posi-

tion displaced from latching association with said gate, a manual operating member connected to rock said latch member about its pivot, a lever connected at one end to rock with said latch member about said fixed axis, a locking member pivoted intermediate its ends on said lever at the other end of said lever, a follower on one end of said locking member, a fixed stop on the cage adapted to be engaged by the other end of said locking member when the gate is locked, a first resilient means interposed between the locking member and lever for biasing said locking member to locate said other end of the locking member adjacent said stop whereby movement of the manual operating member in the gate unlatching direction is arrested by engagement of said other end with said stop before the gate is unlatched, and a second resilient means reacting between said lever and the cage for urging said lever, latch member and operating member in the gate latched direction, said locking member being rocked about its pivot on said lever to displace said other end of the locking member

away from said stop when said follower engages a ramp at a hoist landing whereby the manual operating member may be moved sufficiently in the gate unlatching direction to unlatch said latching member with respect to the gate.

2. In the gate lock mechanism defined in claim 1, said operating member, latch member and lever being secured to a common shaft pivoted upon a support body adapted to be fixed on the cage.

3. In the gate lock mechanism defined in claim 1, said first resilient means reacting between the lever and a portion of said locking member offset from the pivot of said locking member on the lever.

4. In the gate lock mechanism defined in claim 1, said second resilient means reacting between a fixed part on the cage and a pivot pin that rockably mounts the locking member on said lever.

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