

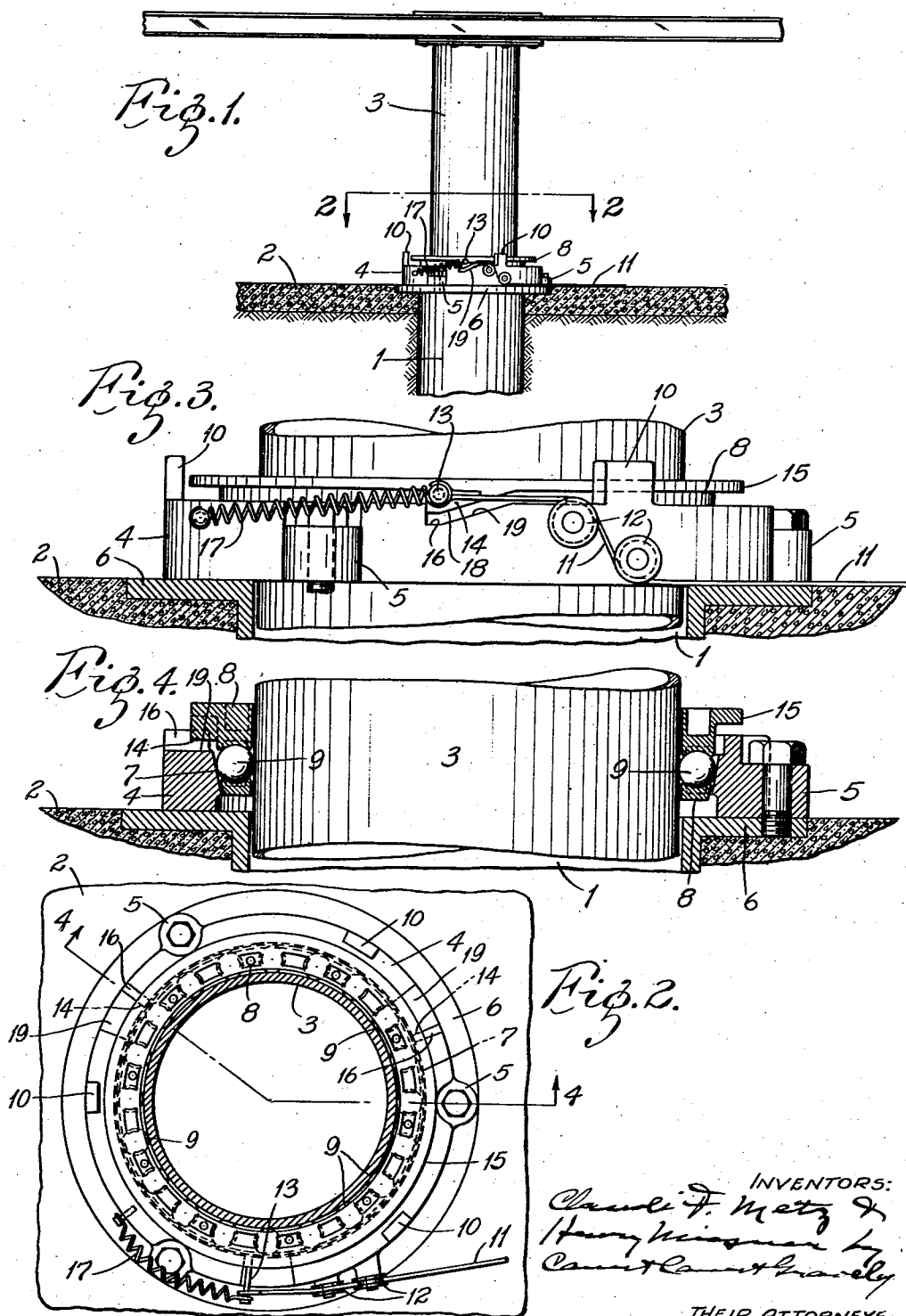
Dec. 5, 1933.

C. F. METZ ET AL

1,938,191

SAFETY DEVICE FOR AUTOMOBILE LIFTS

Filed June 17, 1931



INVENTORS:  
*Charles F. Metz &  
 Harry Kinsman*  
*Countdown & Co.*  
 THEIR ATTORNEYS.

## UNITED STATES PATENT OFFICE

1,938,191

## SAFETY DEVICE FOR AUTOMOBILE LIFTS

Claude F. Metz and Henry Miesner, St. Louis, Mo.

Application June 17, 1931. Serial No. 545,050

8 Claims. (Cl. 254-93)

This invention relates to safety devices for preventing accidental descent of lifting devices, particularly those intended for use in lifting automobiles for purposes of inspection, lubrication or repair. The principal object of the present invention is to provide an efficient safety device that is simple, compact and is not likely to get out of repair; and to provide for the easy installation and operation of said device. This invention consists in the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of the specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a side elevation of a portion of an automobile lift provided with a safety device embodying my invention,

Fig. 2 is a horizontal cross-section on the line 2-2 in Fig. 1,

Fig. 3 is an enlarged side elevation of the safety device and the adjacent portion of the plunger of the lift, the adjacent portions of the base and cylinder of said lift being shown in vertical section; and

Fig. 4 is a vertical longitudinal section on the line 4-4 in Fig. 2.

Referring to the accompanying drawing, a safety device embodying our invention is shown applied to a lifting device of the kind used for raising automobiles to facilitate inspection, lubrication or repair thereof. Such automobile lift, of which only a portion is shown, comprises an upright cylinder 1 mounted in a suitable base 2 and a vertically movable fluid operated plunger 3 working in said cylinder and provided at its upper end with the usual platform for supporting the automobile.

In order to prevent accidental descent of the automobile lift during the ascent thereof and in its raised position, the automobile lift is provided with a safety device that surrounds the vertically movable plunger 3 adjacent to the upper end of the cylinder 1 therefor. Said safety device comprises a base member in the form of a ring 4 that surrounds the plunger 3 and is provided with radial lugs 5 that are preferably bolted to a flange 6 on the upper end of the cylinder 1. The fixed base member of the safety device is provided with a downwardly tapering central conical opening 7, whose diameter is larger than the diameter of the vertically movable plunger 3 so as to provide an annular space between the latter and said conical opening. Mounted to rotate freely in a cage 8, which surrounds the plunger 3 of the lift, is a circular series of annularly spaced balls

9 adapted to seat within the central opening 7 in the base ring 4. By this arrangement, when the lift is raised, the balls 9 tend to move upwardly with the plunger 3 toward the large end of the conical opening 7 in the base ring 4 and thus do not interfere with the upward movement of said plunger. If, however, the lifting means should fail during the ascent of the lift or after it has reached the upper limit of its movement and thus leave the plunger unsupported, the tendency for the plunger to descend will force the balls 9 downwardly towards the small end of the conical opening 7 in the base ring 2, thereby causing said balls to move inwardly in the cage and wedge tightly between said plunger and the wall of said conical opening and thus prevent descent of the plunger. The amount of play required to allow the balls to rotate freely in the cage is sufficient to permit said balls to be pressed inwardly against the plunger. The base ring 4 is provided with a series of annularly spaced upstanding lugs 10 that project above the ball retaining cage 8 and serve to prevent the platform of the lift from bearing on said cage when the lift is in its lowered position.

When it is desired to lower the lift, the safety device is released by means of an operating cable 11 which passes around rollers 12 mounted on the base ring 4 and has its end secured to a pin 13 that projects radially from the upper edge of the ball retaining cage 8. By this arrangement, the retaining cage 8 may be partially rotated by the pull on the operating cable 11. The retaining cage is provided with a series of annularly spaced lugs 14 which depend from a flange 15 at the upper edge thereof and cooperate with notches 16 formed in the upper edge of the base ring 4. Each lug 14 is normally held in abutting relation with one end of a notch 16 by means of a coil spring 17 which has one end anchored to the base ring 4 and the other end connected to the pin 13 to which the operating cable 11 is secured. The lower surface of each lug 14 and the bottom surface of the notch 16 cooperating therewith are provided with inclined surfaces 18 and 19, respectively, which serve as cam faces for forcing the cage 8 upwardly when said surfaces are brought into contact by partially rotating the retaining cage against the tension of the coil spring 17. By this arrangement, the balls 9 may be moved upwardly in the conical opening 7 in the base ring far enough to prevent them from interfering with the downward movement of the plunger 3. When the operating cable 11 is released, the ball retaining cage 8 is automatically returned to its

operative position by means of the coil spring 17.

The hereinbefore described safety device has numerous advantages. It is simple, compact and can be easily installed and is not likely to get out of repair. It operates to prevent accidental descent of the lifting device at any point of its upward movement; and it may be readily rendered inoperative to permit the lift to descend by a pull on the operating cable.

Obviously, the hereinbefore described construction admits of considerable modification without departing from the invention. Therefore, we do not wish to be limited to the precise details of construction shown and described.

What we claim is:

1. A lifting mechanism comprising a vertically movable member, a stationary member provided with a downwardly tapering conical opening through which said member works, wedging members interposed between said vertical movable member and said conical opening for preventing accidental descent of said vertically movable member, a cage for said wedging members, said cage being rotatable about the vertical axis of said vertical movable member, and means for raising said cage to render the wedging members inoperative, said raising means comprising cooperating cam surfaces on said cage and on said stationary member, respectively.

2. A lifting mechanism comprising a vertically movable plunger, a stationary member provided with a downwardly tapering conical opening through which said plunger works, a series of balls surrounding said plunger and fitting within the conical opening in said stationary member, a cage for said balls, and means for raising said cage in said opening, said means comprising a cam surface on said stationary member and a lug on said retaining cage adapted to cooperate with said cam surface.

3. A lifting mechanism comprising a vertically movable plunger, a stationary member provided with a downwardly tapering opening through which said plunger works, a series of balls surrounding said plunger and fitting within the downwardly tapering opening in said stationary member, a cage for said balls, and means for raising said cage in said opening, said means comprising a cam surface on said stationary member and a lug on said retaining cage adapted to cooperate with said cam surface, a spring for normally holding said lug out of contact with said cam surface, and a cable connected to said cage for moving the lug thereof into contact with said cam surface on said stationary member.

4. An automobile lift comprising a vertically movable cylindrical plunger, a stationary base ring provided with a downwardly tapering conical opening through which said plunger works, a circular series of wedging members interposed between said vertically movable plunger and said conical opening for preventing accidental descent of said vertically movable plunger, a rotary and vertically movable cage surrounding said vertically movable plunger and supporting said circu-

lar series of wedging members, and means for raising said cage relative to said conical opening to render said wedging members inoperative, said means comprising cooperating cams on said cage and said base ring adapted to be brought into engagement by rotation of said cage.

5. An automobile lift comprising a vertically movable plunger, a stationary base ring provided with a downwardly tapering conical opening through which said plunger works, vertically movable wedging means interposed between said vertically movable plunger and said conical opening for preventing accidental descent of said vertically movable plunger, and means for raising said wedging means in said conical opening to render said wedging means inoperative, said raising means comprising cooperating cam surfaces on said vertically movable wedging means and on said stationary base ring, respectively.

6. An automobile lift comprising a vertically movable cylindrical plunger, a stationary base ring provided with a downwardly tapering conical opening through which said plunger works, a circular series of balls surrounding said plunger and adapted to engage the periphery thereof and the conical wall of the opening in said base ring, an annular retaining cage for said series of balls, and means for raising said cage to move the balls therein out of contact with the surface of said conical opening.

7. An automobile lift comprising a vertically movable plunger, a stationary base ring provided with a downwardly tapering conical opening through which said plunger works, a circular series of balls surrounding said plunger and adapted to fit between the periphery thereof and the conical wall of the opening in said base ring, a retaining cage for said series of balls, means for raising said cage in said conical opening, said raising means comprising a lug on said cage adapted to cooperate with an upwardly inclined surface on said base ring, a spring for normally holding said lug out of engagement with said inclined surface, and means for rotating said cage to bring the lug thereof in contact with the upwardly inclined surface of said base ring.

8. A vertically movable cylindrical plunger, a stationary member provided with a downwardly tapering conical opening through which said cylindrical plunger works, a circular series of balls interposed between and in contact with said cylindrical plunger and the conical wall of said opening for preventing accidental descent of said plunger, an annular cage loosely interposed between said cylindrical plunger and the conical wall of said opening for retaining said circular series of balls in permanently assembled relation, whereby said balls are adapted for insertion and removal with said annular cage as a unit, and means for raising said annular cage to move the circular series of balls carried thereby out of contact with the surface of said conical opening.

CLAUDE F. METZ.  
HENRY MIESNER.