A. Z. WILSON.

ELEVATOR SAFETY FLOOR.

APPLICATION FILED JUNE 23, 1910.

982,333.

Patented Jan. 24, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

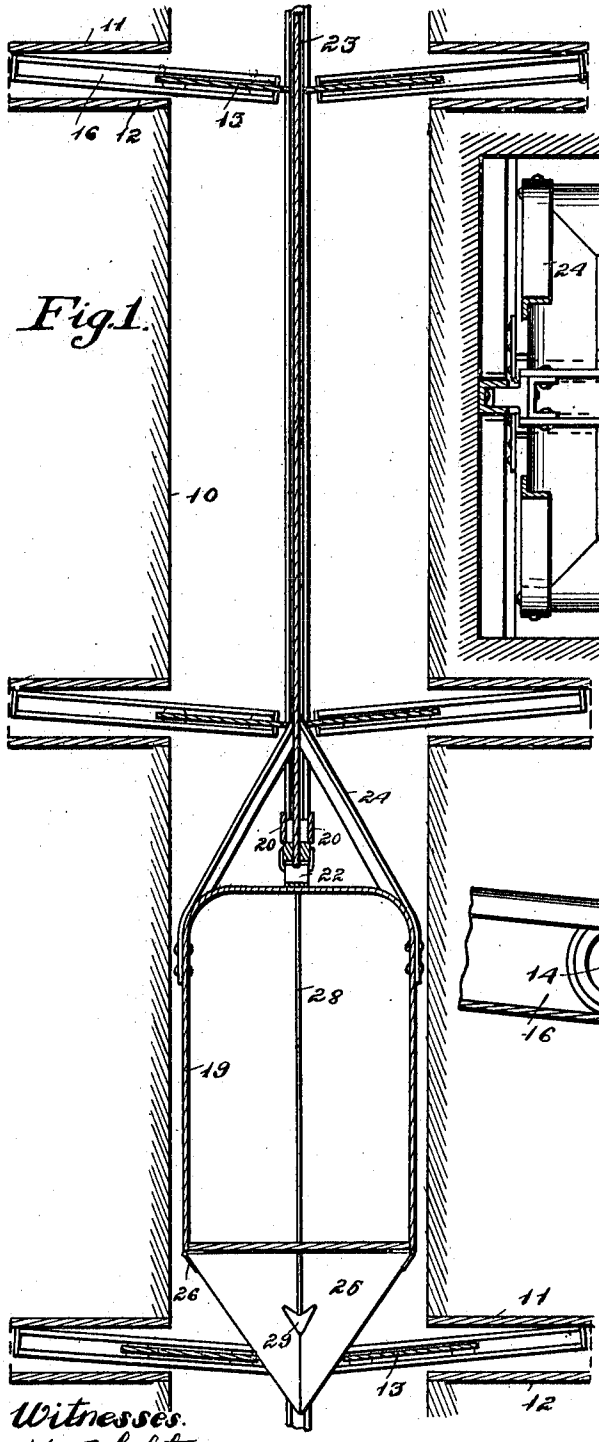


Fig. 2.

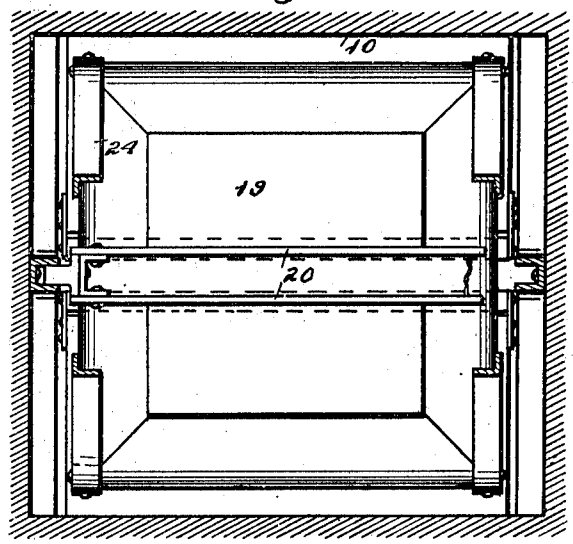
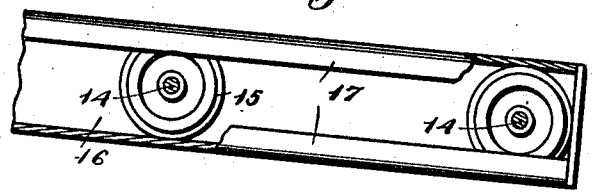


Fig. 3.



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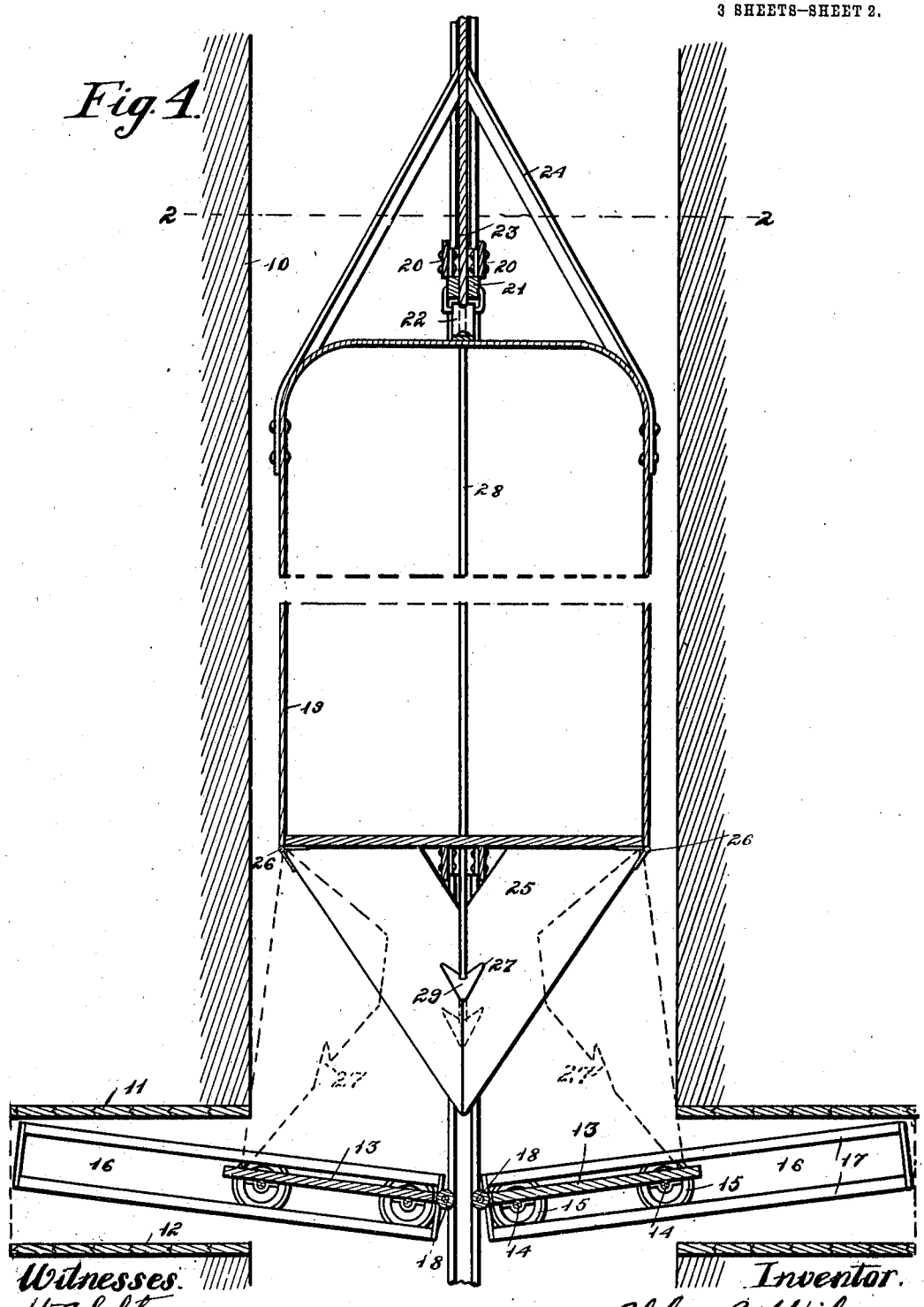
3 SHEETS—SHEET 2.

Fig. 4.



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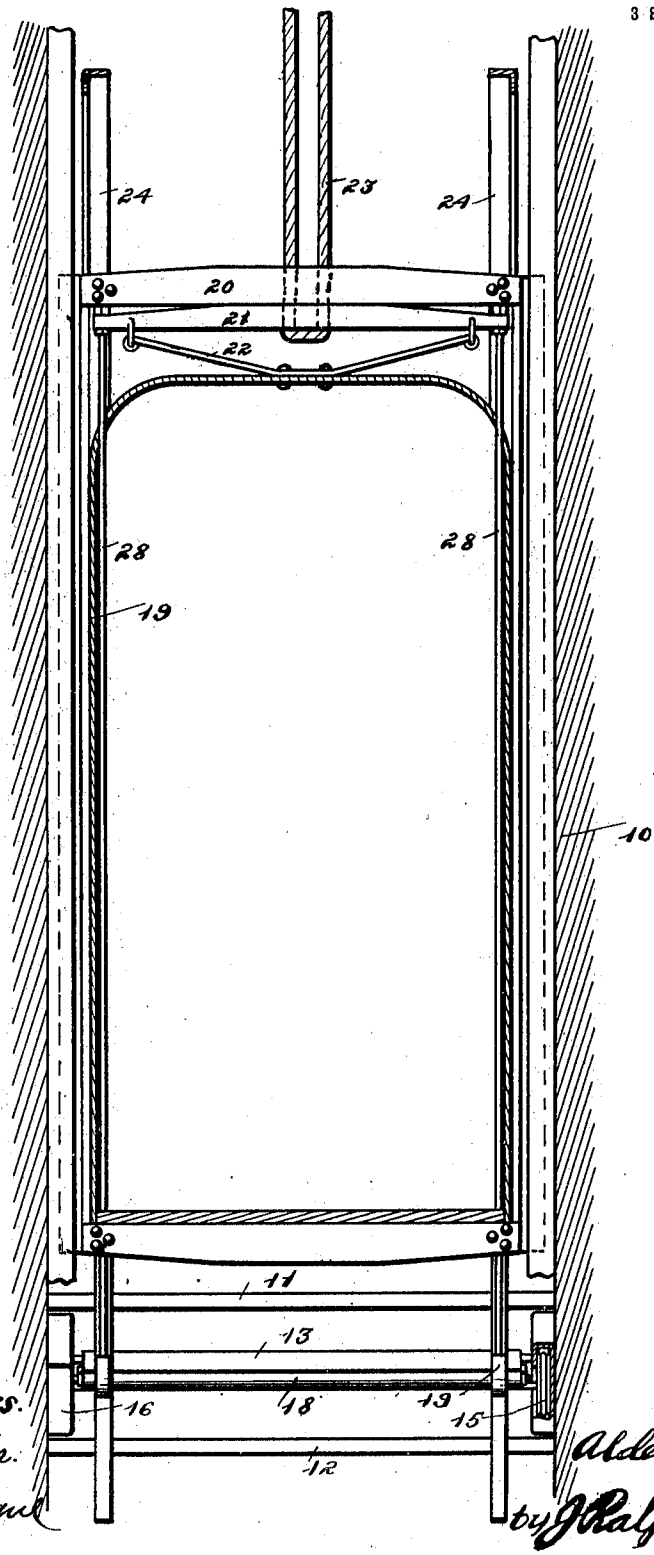
3 SHEETS—SHEET 3.

Fig. 5.



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ELEVATOR SAFETY-FLOOR.

982,333. Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed June 23, 1910. Serial No. 568,475.

To all whom it may concern:

Be it known that I, ALDEN Z. WILSON, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Elevator Safety-Floor, of which the following is a specification.

The objects of my invention are to provide an elevator of simple, durable and inexpensive construction having floor sections arranged at the various landings along the elevator shaft and also arranged to be automatically opened by the passage of the elevator cage in either direction through the shaft and also so arranged as to automatically close after the elevator cage has passed to thereby close the elevator shaft at each floor to thereby prevent persons or objects from falling for more than the distance between two floors through the elevator shaft and also to seal up the elevator shaft to prevent drafts through it in case of fire.

A further object is to provide an improved safety appliance for elevators so arranged that if the supporting rope or cable of the cage should break a number of hinged plates on the elevator cage will be forced downwardly to thereby strike upon the movable floor sections and thus positively prevent the cage from dropping more than the distance between two floors.

My invention consists in certain details, in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a vertical, sectional view of an elevator shaft of a length passing through several floors with my improved elevator cage and safety appliance and a number of automatically closing door sections embodying my invention. Fig. 2 shows a horizontal, sectional view of an elevator shaft taken on the dotted line 2—2 of Fig. 4. Fig. 3 shows an enlarged, detail view, partly in section, illustrating the rollers and roller guide for one of the movable floor sections. Fig. 4 shows a vertical, sectional view of an elevator device embodying my invention, the safety supporting plates being shown by dotted lines in position for supporting the elevator cage on the movable floor sections, and Fig. 5 shows a vertical, sectional view of an elevator embodying my invention taken on a line at right angles to Fig. 4.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the walls of the elevator shaft. At each floor throughout the length of the elevator shaft I have provided a movable floor section to extend between the stationary floor 11 and the stationary ceiling 12 below the floor. Each of these movable floor sections comprises a floor body portion 13 having two axles 14 connected therewith and on each axle are two rubber tired wheels 15. Each pair of wheels on the same side of the floor section is mounted in a track device comprising a plate 16 having its margins turned inwardly and formed into tracks 17 designed to receive the wheels 15 as clearly shown in Fig. 3. These tracks are preferably inclined and extend to points adjacent to the center of the elevator shaft as shown in Fig. 4. On the inner end of each floor section 13 is a roller 18. These rollers on two adjacent track sections normally stand spaced apart from each other a few inches, as shown in Fig. 4, so that the elevator supporting rope or cable may pass through without engaging the floor sections. By this arrangement of parts it is obvious that in their normal positions these floor sections will prevent persons or articles from falling down the elevator shaft and they will also substantially close the opening in the elevator shaft at each floor throughout the length of the shaft and it is also obvious that they may be readily and easily moved to positions to permit the passage of an elevator cage and that after the elevator cage has passed they will assume their normal positions by gravity.

My improved elevator cage comprises a cage body portion 19 having at its top a supporting beam 20 firmly fixed to the sides of the elevator cage and below the beam 20 is a movable beam 21 having its ends supported upon a spring 22 which is attached at its central portion to the top of the cage and which normally tends to move the beam 21 downwardly relative to the beam 20. The supporting rope or cable 23 is extended through the beam 20 and attached to the beam 21 so that the resiliency of the spring 22 is overcome by the weight of the cage resting upon the beam 20 to thereby cause

the beam 20 to normally engage the top of the beam 21. However in the event that the rope or cable should be broken and the weight of the cage relieved from the part of the rope 23 that engages the beam 21 then the said beam 21 will be moved downwardly a short distance by the spring 22. Fixed to the top of the cage are two guide rail devices 24 extended upwardly and toward the center of the cage. These guide rail devices are for the purpose of engaging the rollers 18 of the movable floor sections as the elevator cage passes upwardly.

For automatically stopping the descent of the elevator cage when its supporting rope or cable is broken I have provided at the bottom of the elevator cage two hinged supporting plates 25 being connected at their outer corners with the cage by means of the hinges 26. When these supporting plates are in their normal positions, as shown in Fig. 4, their inner edges are adjacent to each other and their outer edges are inclined downwardly and toward the center of the elevator shaft and in the inner edge of each is a notch 27.

Fixed to the ends of the beam 21 are two rods 28, which rods extend downwardly through the cage and on the lower end of each is a head 29 having lugs thereon to enter the notches 27 so that during the time that the beam 21 is in the position shown in Fig. 5 the head 29 will securely hold the supporting plates 25 toward each other and when in said positions these supporting plates will engage the rollers 18 and force the movable floor sections apart when the elevator cage is descending. In the event however that the supporting rope or cable is broken the spring 22 will force the head 29 downwardly with sufficient force to spread the supporting plates 25 apart to the position shown by dotted lines in Fig. 4, whereupon said supporting plates will strike upon the floor sections 13 and engage them in such a manner as to prevent further downward movement of the cage so that it is not possible for the elevator cage to fall for a distance more than the space between two floors.

In practical operation, and assuming that the elevator cage is being moved upwardly then the guide rails 24 will successively strike upon the rollers 18 at each floor and move the floor sections 13 to open position. These floor sections will move readily and easily and without noise or jar for the reason that they are supported on rubber tired wheels and for the further reason that they may be made of simple construction and of light weight. As the cage passes each floor the weight of the floor sections will cause them to descend by gravity and follow along the supporting plates 25 until they again come to position adjacent to each other as shown in Fig. 4. When the elevator cage is descending the supporting plates 25 will first engage the rollers 18 of the movable floor sections and force them apart and they will again automatically close by following along the guide rails 24 as the elevator descends. Furthermore, in the event of a breakage of the supporting rope or cable, the supporting plates 25 will be automatically moved outwardly and they will engage the first movable floor sections below them and thus stop the falling movement of the elevator cage.

It is obvious that the use of my improved means for stopping the descent of the elevator cage when its supporting rope or cable is broken does not in any way interfere with the use of any other safety appliance that may be desired on the elevator cage.

One of the important advantages of my invention is that when the elevator cage is at either limit of movement in the shaft, the shaft will be closed at each floor to thereby avoid danger of persons or articles falling down the elevator shaft and also to close the elevator shaft in such a manner that drafts will not be created through it during fire in the building in which the shaft is located.

I claim as my invention:

1. In a device of the class described, the combination of an elevator shaft, two movable floor sections normally arranged in positions slightly spaced apart from each other at the center of the shaft and capable of being moved away from each other to positions at the sides of the shaft, an elevator cage, two supporting plates hinged at their outer corners to the elevator cage and having their outer edges inclined downwardly and toward the center of the shaft and also having notches at their inner edges to coincide with each other, a rod slidingly connected with the cage and having a head on its lower end designed to engage the notches of the supporting plates, and means for releasing said head from engagement with said notches so that the plates may swing outwardly, for the purposes stated.

2. In a device of the class described, the combination of an elevator shaft, two movable floor sections normally arranged in positions slightly spaced apart from each other at the center of the shaft and capable of being moved away from each other to positions at the side of the shaft, an elevator cage, two supporting plates hinged at their outer corners to the elevator cage and having their outer edges inclined downwardly and toward the center of the shaft and also having notches at their inner edges, a main supporting beam fixed to the top of the cage, a supporting beam below it, a spring device fixed to the cage and to the second supporting beam, a supporting rope or cable fixed to the second supporting beam, a rod fixed to

the second supporting beam and slidingly connected with the cage and having a head on its lower end designed to rest in the notches of the supporting plates, said parts being so arranged that when said head is moved downwardly relative to the supporting plates they will be spread apart to thereby strike upon the tops of the movable floor sections, substantially as and for the purposes stated.

Des Moines, Iowa, June 9, 1910.

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