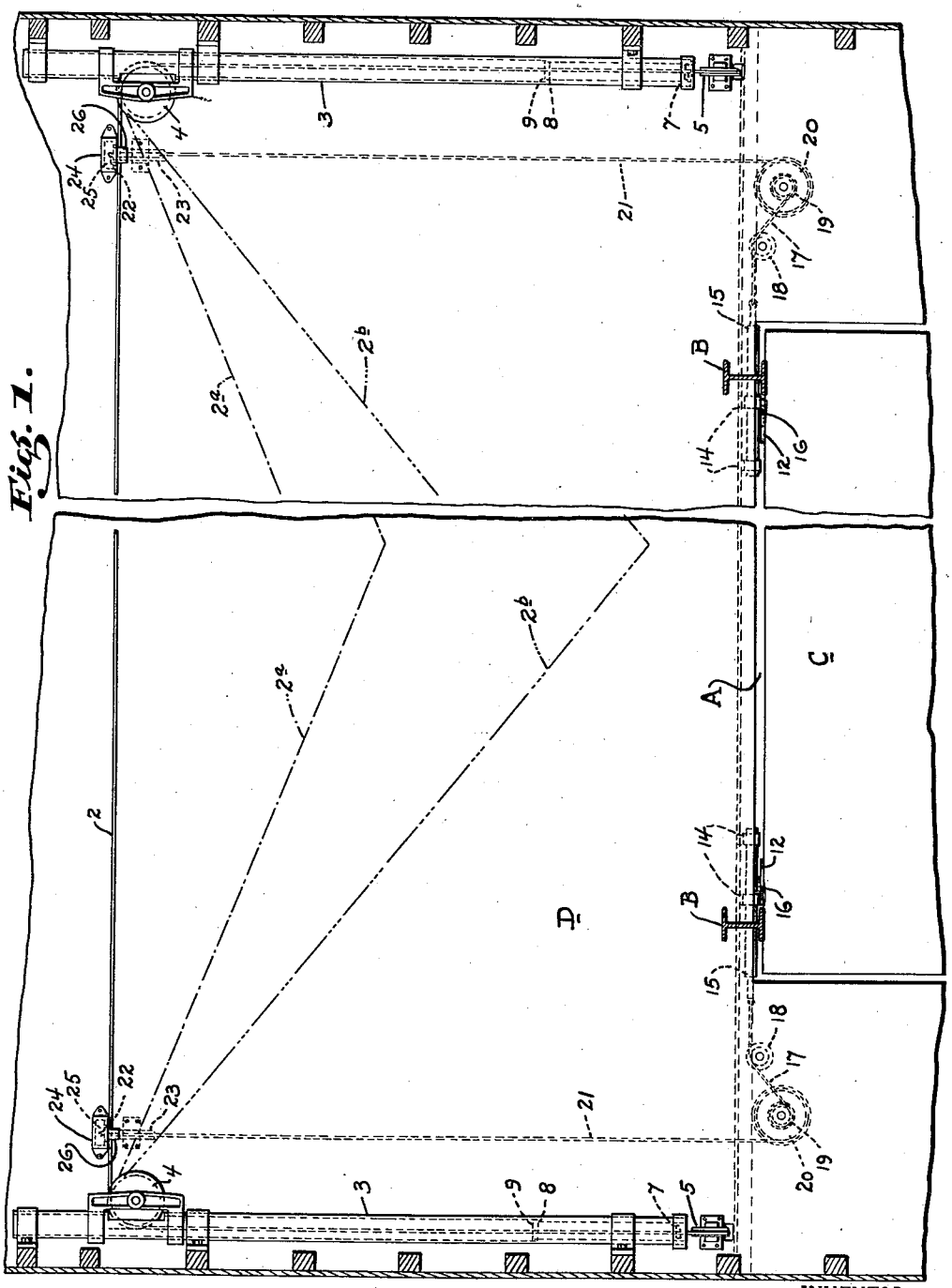
Dec. 5, 1939. C. WHITE 2,182,508

ELEVATOR GATE OR BARRIER

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Fig. 1.



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Fig. 3.

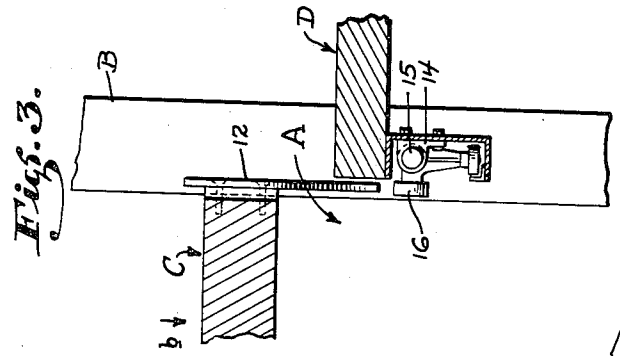


Fig. 4.

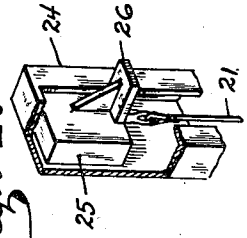


Fig. 5.

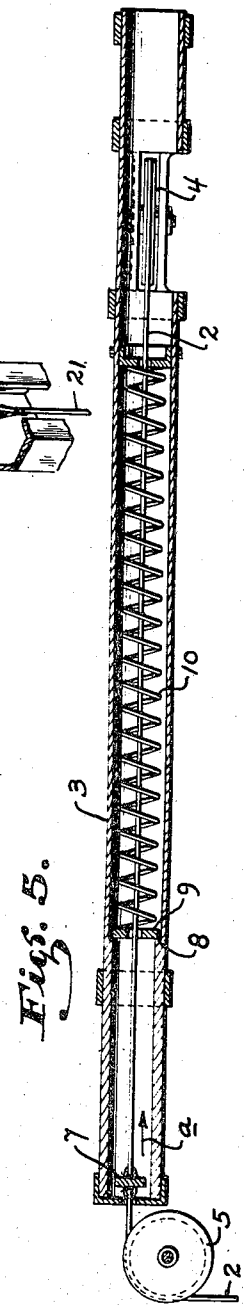
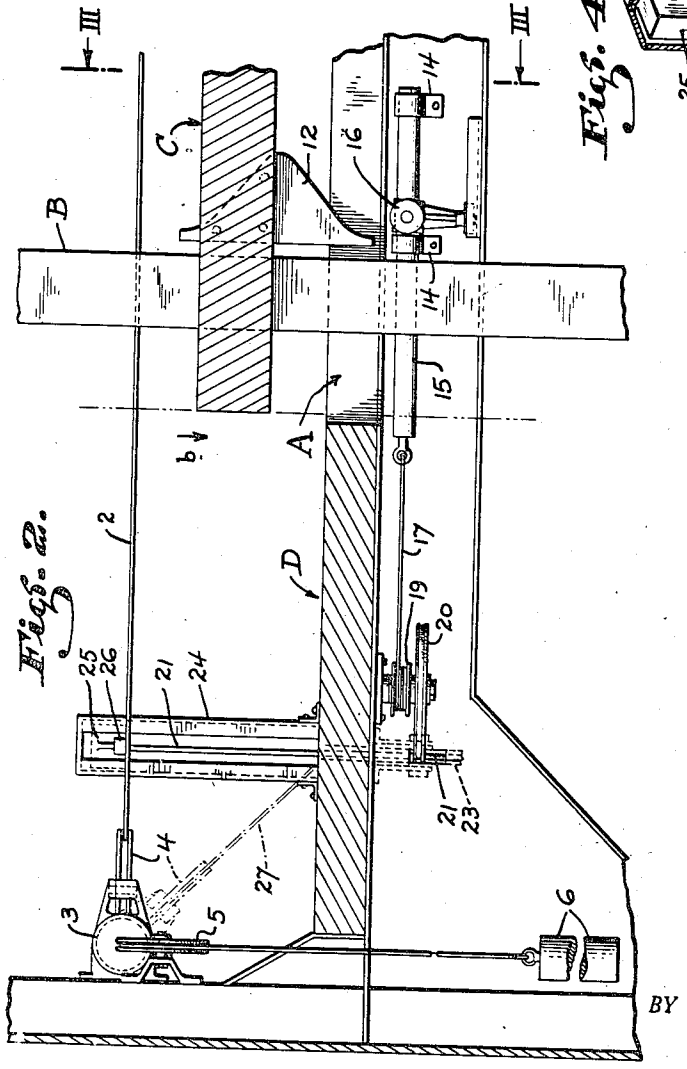


Fig. 2.



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ELEVATOR GATE OR BARRIER

Charles White, San Francisco, Calif.

Application September 27, 1938, Serial No. 231,911

3 Claims. (Cl. 187—51)

This invention relates to an elevator gate or barrier, and particularly to a yielding barrier of sufficient strength to bring a power driven freight truck to a complete stop within a distance of eight or twelve feet, if the barrier is accidentally bumped or run into.

In warehouses, where freight is transferred from one floor to another, it is becoming common practice to move the freight by means of small motor-operated trucks. That is, the truck is raised by an elevator to a particular floor; it is then run off the elevator and loaded, then driven back to the elevator and lowered to another floor or to street level, and is then run off, so that the freight may be unloaded from the truck directly to freight cars or other trucks which are going to carry the freight to another destination. Freight barges and ships having two or more decks are also being loaded and unloaded in this manner; that is, freight is piled onto the truck on the wharf, then it is run up a gangway onto the deck of the ship, and onto an elevator which lowers it into the hold. To begin with, the elevator may lower the truck to the lowermost deck; the truck is then run off the elevator and the freight is unloaded. Conversely, if a ship is being unloaded, the truck may be lowered by the elevator to one deck or another to permit the freight to be loaded thereon, and it is then run back onto the elevator and raised to the deck, and then run down the gangplank to the dock.

While gates or barriers of different characters have been used in connection with elevators, they are almost useless where freight trucks of the character described are employed, as it is almost impossible to build them rigid enough to resist the impact of a loaded or even an empty truck, if the gate is bumped or run into.

The object of the present invention is generally to improve and simplify the construction and operation of elevator gates or barriers; to provide a barrier in the form of a heavy steel cable which has sufficient strength to withstand bumping and impact of power driven freight trucks; to provide a support for the steel cable which permits it to yield and gradually bring a truck to a complete stop before it can reach the elevator shaft and fall into it; to provide means actuated by movement of the elevator for automatically lowering the steel cable or barrier to the floor when the elevator moves into alignment with the floor, so as to permit the wheels of the truck to run freely over the cable in driving onto or off the platform of the elevator; and further, to provide means for automatically raising the cable to barrier position when the elevator moves away from the floor.

The elevator gate or barrier is shown by way of illustration in the accompanying drawings, in which

Fig. 1 is a partial plan view of the same;

Fig. 2 is an enlarged vertical cross section;

Fig. 3 is a vertical cross section taken on line III—III of Fig. 2;

Fig. 4 is a perspective view of the upper end of one of the vertical guide tracks 24, said view also showing one of the shoes and the dog carried thereby; and

Fig. 5 is an enlarged longitudinal section of one of the cylinders containing the compression springs.

Referring to the drawings in detail, and particularly to Figs. 1 and 2, A indicates an elevator shaft, in which are mounted columns or tracks B between which the platform C of a freight elevator is guided. The elevator shaft may extend between any number of floors desired, but as the gate or barrier forming the subject matter of this application, together with the mechanism for operating the same, are identical on each floor, only one floor is shown, and is indicated at D.

The barrier employed is a steel cable such as shown at 2. It is normally maintained in stretched or taut condition across the opening leading into the elevator shaft. It is placed about ten feet ahead of said opening, and about three feet above the floor. Means are employed for automatically lowering the cable to the floor so that the wheels of a truck can freely run over it when driving onto or off the elevator platform. Means are also provided for raising the cable to barrier position when the elevator leaves the floor, and means are provided for imposing a gradually increasing resistance to the cable so as to bring a truck to a full stop before it can fall into the elevator shaft, if the truck accidentally backs or runs into the carrier cable. The mechanism employed will be as follows.

Disposed on each side of the elevator shaft is an elongated cylinder such as shown at 3. This cylinder is horizontally disposed at a position about three feet above the floor, that is, at the same elevation as the barrier cable 2. At one end of each cylinder is mounted a guide sheave 4; the barrier cable 2 passes over the guide sheaves completely through each cylinder from end to end thereof, and then passes over guide sheaves 5, and then down through the floor. The respective ends of the cable are provided with weights 6 which normally function to maintain the cable in

a stretched or taut condition across the opening to the elevator shaft. They also serve a second function, to wit, that of raising the cable to barrier position when the elevator leaves the floor. Secured on the cable within each cylinder is a collar 7. Formed within each cylinder is an annular seat or shoulder 8, and resting thereon is a heavy washer 9, between which and the opposite end of each cylinder is a heavy compression spring 10. The barrier cable passes freely through the compression spring and the washer 9, so that the barrier cable is free to move without imparting any compressive movement to the springs except when the collars 7 move in the direction of arrow *a* and engage the washers 9 (see Fig. 5). There is a distance of approximately three feet between the washers 9 and the adjacent ends of the cylinders, and collars 7 will travel freely through this distance when the barrier cable is to be raised or lowered. That is, the weights 6 will resist such movement when the barrier cable is being lowered to the floor; and conversely, they will raise the barrier cable when it is to be raised.

The compression springs 10, on the other hand, come into operation when the collars 7 engage the washers 9 and travel in the direction of arrow *a*. This will happen only if a truck backs into the barrier cable when it is in raised position. If the truck backs into it only a short distance, the barrier cable will move to the dotted line position shown at 2*a*. Hence the only resistance against movement of the truck is that of raising the two weights 6, but if the truck should continue backing, the cable may finally assume the position shown at 2*b*. When the cable is moved to the point 2*a* the collars 7 will engage the washers 9. Hence if the truck continues backing towards the elevator shaft opening, the compression springs will start to compress, and they will gradually impose a greater and greater resistance, and as such will bring the truck to a gradual stop, and a final stop when the position 2*b* is reached, as the springs will then be under full compression. A yielding barrier of this character is flexible and can not be damaged by a truck backing or running into it, and in addition thereto it will afford a gradually increasing resistance which will positively bring a truck to a stop before it can enter and fall down the elevator shaft.

The mechanism for lowering the barrier cable is actuated by the elevator C. On one side of the elevator is secured a pair of cam-shaped plates such as shown at 12. Secured to the under side of the floor, adjacent each cam plate, are a pair of bearing brackets 14. Slidably mounted in each pair of brackets is a rod 15. On each rod is mounted a roller 16 which projects into the path of the cams 12. If the elevator platform is traveling downwardly towards the floor, or in the direction of arrow *b* (see Fig. 2), the lower face of the cams will engage the rollers 16 and force them, together with the rods, in an inward direction. Each rod is connected with a cable 17. These cables pass over guide sheaves 18 and are anchored to sheaves 19. On the same shafts carrying the sheaves 19 are sheaves 20, and anchored thereto are cables 21. These pass under the floor to the point 22 (see Fig. 1), and there pass over guide sheaves 23. They then pass through the floor and upwardly through channel-shaped guides 24. Slidably mounted in each channel-shaped guide is a shoe 25 to which the cables 21 are secured, and projecting from each shoe is a finger or dog 26 which extends across the barrier cable 2. The pull exerted by the rods when the rollers 16 are engaged by the cams 12 pulls the shoes 25 from their raised position shown in Fig. 2 to a position in alignment with the floor. During this movement the dogs 26 straddle the barrier cable, and as such force it down to the floor, or to the dotted line position indicated at 27. The wheels of a truck are thus free to ride over the same when driving onto or off the elevator platform. That is, if the platform is stopped and aligned with that floor, the barrier cable will remain in this lowered position as long as the elevator stands at that floor. The moment, however, that the elevator leaves, whether it is to go up to another floor or to be lowered to street level, the cams 12 will move away from the rollers 16, and the barrier cable will then automatically raise, as a pull is constantly exerted on the barrier cable by the weights 6. The weights 6, in other words, automatically raise the barrier cable to barrier position, and they will at the same time raise the shoes and dogs 26 to the upper ends of the channel tracks 24, when the elevator leaves the floor. Conversely, the cams 12 on the elevator will lower the barrier cable to the floor as the elevator approaches the floor and aligns therewith. The weights 6 thus function not only to raise the barrier to barrier position, but also to maintain the barrier cable in raised position and in a taut stretched condition.

The compression springs 10 within the cylinders 3, on the other hand, impose a gradually increasing resistance if the cable is run or backed into by a truck, and as it is positioned approximately ten to twelve feet away from the elevator shaft opening, the truck will be brought to a gradual and final stop at the point 2*b*, thus making it impossible for a truck to back or run into the elevator shaft except when the elevator platform is in alignment with that floor.

In the drawings here presented, the barrier is shown as stretched across one side of the elevator shaft only. Obviously it may be applied to both sides of the elevator shaft, if the shaft is approachable from opposite sides, but as the mechanism employed would be identical to that described, the showing thereof is thought unnecessary. Also, while certain other features of my invention have been more or less specifically described and illustrated, I nevertheless wish it understood that changes may be resorted to within the scope of the appended claims.

Having thus described and illustrated my invention, what I claim and desire to secure by Letters Patent is:

1. The combination with an elevator shaft extending between a plurality of floors, and an elevator operable therein, of a barrier on each floor in front of the elevator shaft, each barrier comprising a cable disposed at an elevation above the floor to engage the bumper of a power driven truck, yielding means at each end of each cable to gradually bring a truck to a stop before it can reach the elevator shaft if the truck accidentally backs into or runs against the cable when the elevator is positioned at some other floor, a vertical guide track adjacent each end of each cable, a shoe slidably mounted in each track, a dog on each shoe extending over and engaging the cable, means connected with each cable for normally maintaining the cables, the dogs and the shoes in an elevated position with relation to the floors, and means actuated by movement of

the elevator as it approaches a floor, for exerting a downward pull on the shoes and dogs to lower the cable to the floor so that the wheels of a truck can run over the cable and onto the elevator when the elevator aligns with a floor.

2. The combination with an elevator shaft extending between a plurality of floors, and an elevator operable therein, of a barrier on each floor in front of the elevator shaft, each barrier comprising a cable disposed at an elevation above the floor to engage the bumper of a power driven truck, a vertical guide track adjacent each end of each cable, a shoe slidably mounted in each track, a dog on each shoe extending over and engaging the cable, means connected with each cable for normally maintaining the cables, the dogs and the shoes in an elevated position with relation to the floors, means actuated by movement of the elevator as it approaches a floor, for exerting a downward pull on the shoes and dogs to lower the cable to the floor so that the wheels of a truck can run over the cable and onto the elevator when the elevator aligns with a floor, and other means connected with the cables to gradually bring a truck to a stop before it can reach the elevator shaft, if the truck accidentally backs into or runs against the cable when the elevator is positioned at some other floor.

3. The combination with an elevator shaft extending between a plurality of floors, and an elevator operable therein, of a barrier on each floor in front of the elevator shaft, each barrier comprising a cable disposed at an elevation above the floor to engage the bumper of a power driven truck, a pair of cylinders disposed on each floor one on each side of the elevator shaft, guide pulleys one at each end of each cylinder, the ends of the cables passing longitudinally through the cylinders and over the guide pulleys, a weight on each end of each cable, said weights normally maintaining each cable in a taut elevated position between each pair of cylinders, a shoulder in each cylinder, a perforated washer normally engaging each shoulder, a compression spring in each cylinder and interposed between each washer and one end of each cylinder, and a collar in each cylinder, said collars being secured to each cable one adjacent each end thereof, said collars having a predetermined travel within each cylinder before engaging the washers to permit lowering of the cables to the floor without causing compression of the springs, but causing compression of the springs when the center portion of a cable is moved horizontally more than the predetermined travel of the collars within the cylinders.

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