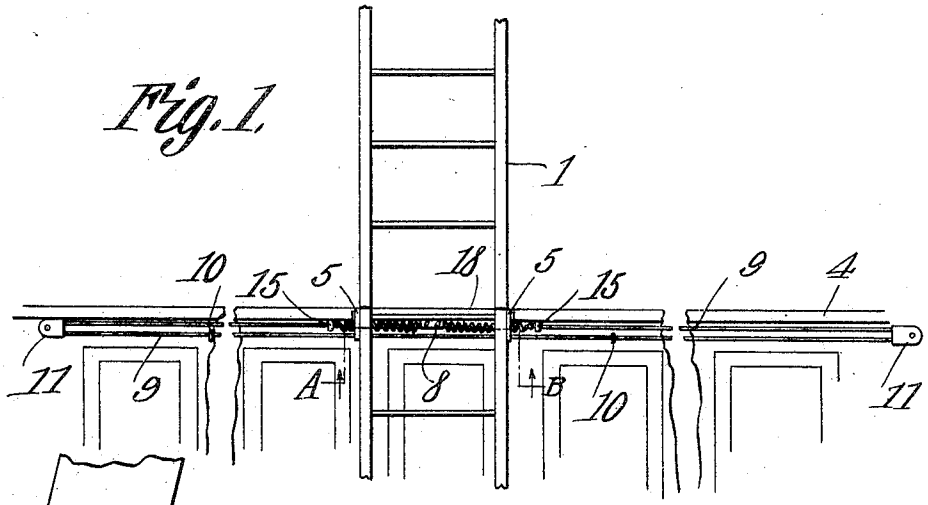
F. S. PLAISTED.

LADDER.

APPLICATION FILED JUNE 19, 1909

971,786. Patented Oct. 4, 1910

Fig. 1.



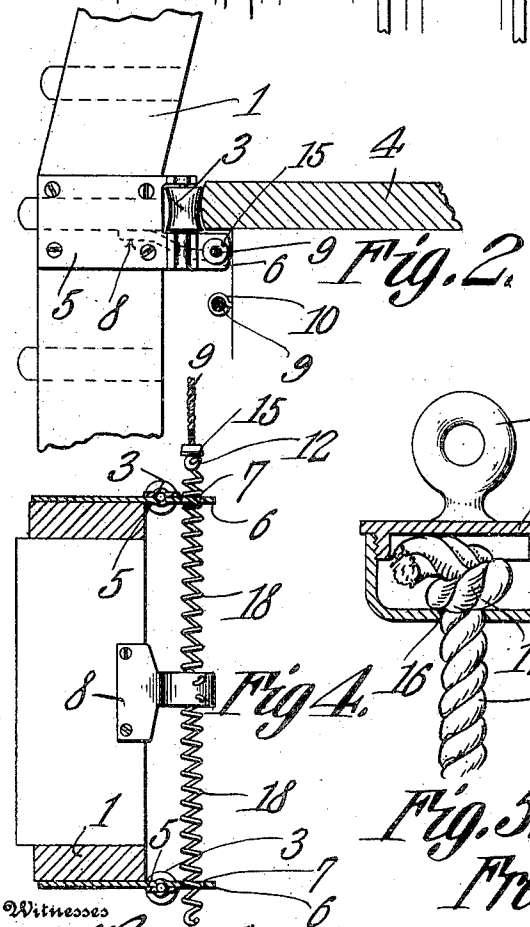


Fig. 2.

Fig. 4.

Fig. 5.

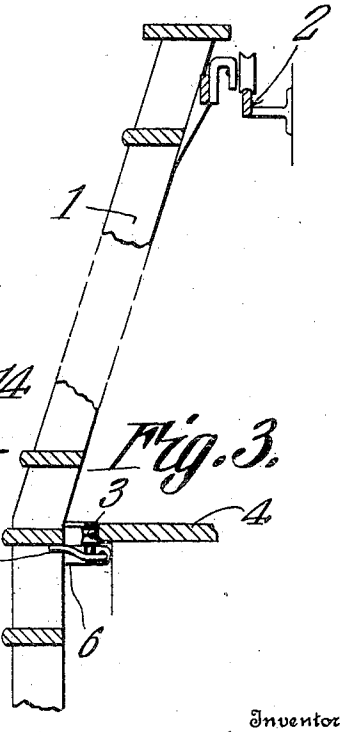


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

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LADDER.

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To all whom it may concern:

Be it known that I, FREDERIC S. PLAISTED, a citizen of the United States, residing at Penn Yan, in the county of Yates and State of New York, have invented a new and useful Ladder, of which the following is a specification.

This invention has reference to improvements in ladders and more especially to ladders used in stores for gaining access to elevated shelves and the like.

The object of the present invention is to provide a means for moving the ladder to any desired position along a line of shelving from any point which means are accessible at any point along the line of travel of the ladder.

Store service ladders are usually hung upon rollers at the upper end traveling along a track and coincident with the usual shelf or ledge of counter height, the ladder is provided with bearing rollers traveling along the edge of the ledge or extended shelf. It is customary with such store ladders for a person desiring to use the ladder to grasp the ladder by hand and move it to the desired point. If such person be at one end of the shelves and as often happens the ladder be at the other end of the shelves then the operator must first walk to the ladder and then move it to the desired point.

In accordance with the present invention there is provided a rope or other flexible strand having an idle run the length of the shelves or the length of travel of the ladder and the two ends of the rope are returned toward the ladder after passing around pulleys at the ends of the shelves and these rope ends are each connected to the ladder on opposite sides of the latter through the intermediary of a stout spring and a connecting member which normally is located a short distance from the side of the ladder so that when the ladder shall reach the end of its travel the connecting member will strike the pulley, or a fixed stop if so desired, and the spring will operate as an elastic buffer thus slowly and silently arresting the movement of the ladder. Furthermore the spring on the side of the ladder toward the direction of travel acts as an elastic starting means so that the full strain of starting does not come immediately upon the operator. Furthermore, an operator may be standing at any point along the shelves and even though the ladder be distant the operator need not move from his position in order to draw the ladder to him or to the point desired.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification in which drawings—

Figure 1 is a front elevation of a ladder equipped with the present invention. Fig. 2 is a side elevation of a portion of the ladder adjacent to the counter-high shelf or ledge. Fig. 3 is a central vertical section of the ladder. Fig. 4 is a section on the line A—B of Fig. 1 looking upward. Fig. 5 is a detail section of one of the rope connecting members.

Referring to the drawings, there is shown a ladder 1 which may be taken as typical of any of the usual types of store ladders supported at the upper end on a track 2 and near the lower end provided with bearing rollers 3 engaging the usual ledge 4. The ledge 4 is the usual ledge or extended shelf at the base of the usual shelves for the storage and display of goods, which shelves it is desirable to reach by means of the ladder 1, this ladder being movable along the front of the shelves to any desired point. The rollers 3 are usually mounted in a suitable boxing or bracket 5 fast to the corresponding side of the ladder 1 and in the present instance one portion 6 of said bracket or boxing is extended toward the shelves to underride the ledge 4, this extended portion being indicated at 6 and under the ledge 4 this extended portion is provided with a through passage or perforation 7.

Fast to a step which is usually about on the level of the ledge 4 is a plate 8 suitably bent and sufficiently extended to underride the ledge 4 at a point about midway between the sides of the ladder.

Extending along the length of the shelving beneath the overhanging edge of the ledge 4 is a rope or other flexible strand 9 having an idle run supported in eyes 10 or by any other suitable means while at the ends of the range of travel of the ladder 1 the rope 9 is passed around pulleys 11 and from thence returned to the ladder. The ends of the rope 9 are each secured to an eye 12 formed on one face of a plate 13, the other face of which may be formed with a circular rib 14 threaded on its outer face to receive a cap 15 having a central perforation

16 for the end of the rope 9, which end may be knotted as indicated at 17 and confined by the cap 15 between the same and the plate 13.

Fastened to the free end of the plate 8 and extending in opposite directions therefrom are springs 18 of the coiled type and these springs extend through the passages 7 in the bracket extensions 6 and are ultimately secured to the eyes 12, the arrangement being such that these springs extend normally beyond the plate 8 so that the eyes 12 are outside the ladder. The springs 18 are sufficiently heavy for the purpose and their turns are normally separated so that the springs may act either as compression or extension springs as demanded. The springs are of such strength as to maintain the rope or strand 9 in a taut condition without material extension of the springs, this being quite feasible since a rope of sufficient strength for the purposes of this invention may be of small diameter and quite light.

It is to be observed that the end runs of the rope 9 which extend from the pulleys 11 to the ladder 1 are, because of the arrangement of the bracket extensions 6 and plate 8 located underneath the overhang of the ledge 4 so as to be out of the way but at the same time readily accessible to an operator wishing to move the ladder.

With a ladder equipped as described an operator at any point along the line of shelving may grasp the return runs of the rope 9 and pull the ladder toward him. Because of the elasticity of the springs 18, the spring toward the operator will yield to a certain extent on the pull of the rope thus storing up a certain amount of power in the spring which is then exerted upon the ladder and the latter is started much more easily than though the spring were not present. Furthermore, the giving of the springs permits the operator to pull the rope strand readily from under the ledge 4 so that the rope may be readily handled.

It often happens that the ladder must be brought to the extreme end of its range of travel and then it will strike the pulley 11 at that end or it will strike a fixed stop. The cap 15 is so shaped as to engage the pulley 11 or a fixed stop if such be used, and because of the location of the cap 15 and plate 13 beyond the bracket 6 the spring 18 then becomes more or less compressed by the momentum of the ladder and acts as a spring buffer to arrest the movement of the ladder without noise or shock. As the connection for the end of the rope moves toward the bracket extension 6 on the engagement of the said connection with the pulley 11, the rope is moved toward the ladder at this end of the rope and consequently the other end of the rope is moved away from the ladder so that under these circumstances one of the springs 18 resists the movement of the ladder on being compressed and the other spring is extended and so acts in resisting the movement of the ladder. Thus the two springs co-act to operate as an elastic buffer or stop for the ladder and therefore lighter springs may be utilized than would be the case were one spring only employed for the purpose.

It is to be observed that the diameter of the cap plates 13 is greater than the diameter of the passages 7 so that these members cannot pass through the bracket extensions 6 but are stopped thereby when the corresponding springs 18 are compressed sufficiently to bring the plates 13 to said bracket extensions 6. The distance, however, of the projection of the springs 18 beyond the outer face of the bracket extension 6 is sufficient to ease up and practically stop the movement of the ladder when it reaches the end of its range of travel.

While in the description and drawings a particular type of store ladder is indicated, it will be understood that the invention is not limited to such type, but may be used with any type of guided store ladders.

What is claimed is:

1. In a store ladder operating means, a rope or flexible strand, pulleys for the rope at the ends of the range of travel of the ladder, and elastic connections between the respective ends of the rope and the corresponding sides of the ladder, said elastic connections projecting beyond the sides of the ladder to engage the pulleys when the ladder reaches the limits of its travel, and both runs of the rope being accessible to an operator at any point along the range of travel of the ladder.

2. In a store ladder operating means, a rope or flexible strand, pulleys for the rope at the ends of the range of travel of the ladder, and springs between the ends of the rope and the ladder capable of either compression or extension from their normal condition, each spring at the end connected to the rope extending beyond the corresponding side of the ladder to engage a respective one of said pulleys at the limits of travel of the ladder.

3. In a store ladder operating means, a rope or flexible strand, pulleys for the rope at the ends of the range of travel of the ladder, springs between the ends of the rope and the ladder and capable of either compression or extension from their normal condition, each of said springs at the end connected to the rope extending beyond the corresponding side of the ladder to engage a respective one of said pulleys at the limits of travel of the ladder, and laterally extended couplings between the rope ends and the springs.

4. In a store ladder operating means, a

rope or flexible strand, pulleys for rope at the ends of the range of travel of the ladder, springs between the ends of the rope and the ladder capable of either compression or extension from their normal condition, each of said springs at the end connected to the rope extending beyond the corresponding side of the ladder to engage a respective one of said pulleys at the limits of travel of the ladder, laterally extended couplings between the rope ends and the springs and located beyond the sides of the ladder, guide members on the ladder for the springs, and an intermediate connection upon the ladder for the springs, both the guide members and the intermediate connection projecting beyond the inner face of the ladder.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FREDERIC S. PLAISTED.

Witnesses:

MAGGIE A. SMALLEY,

HENRY W. FISH.