

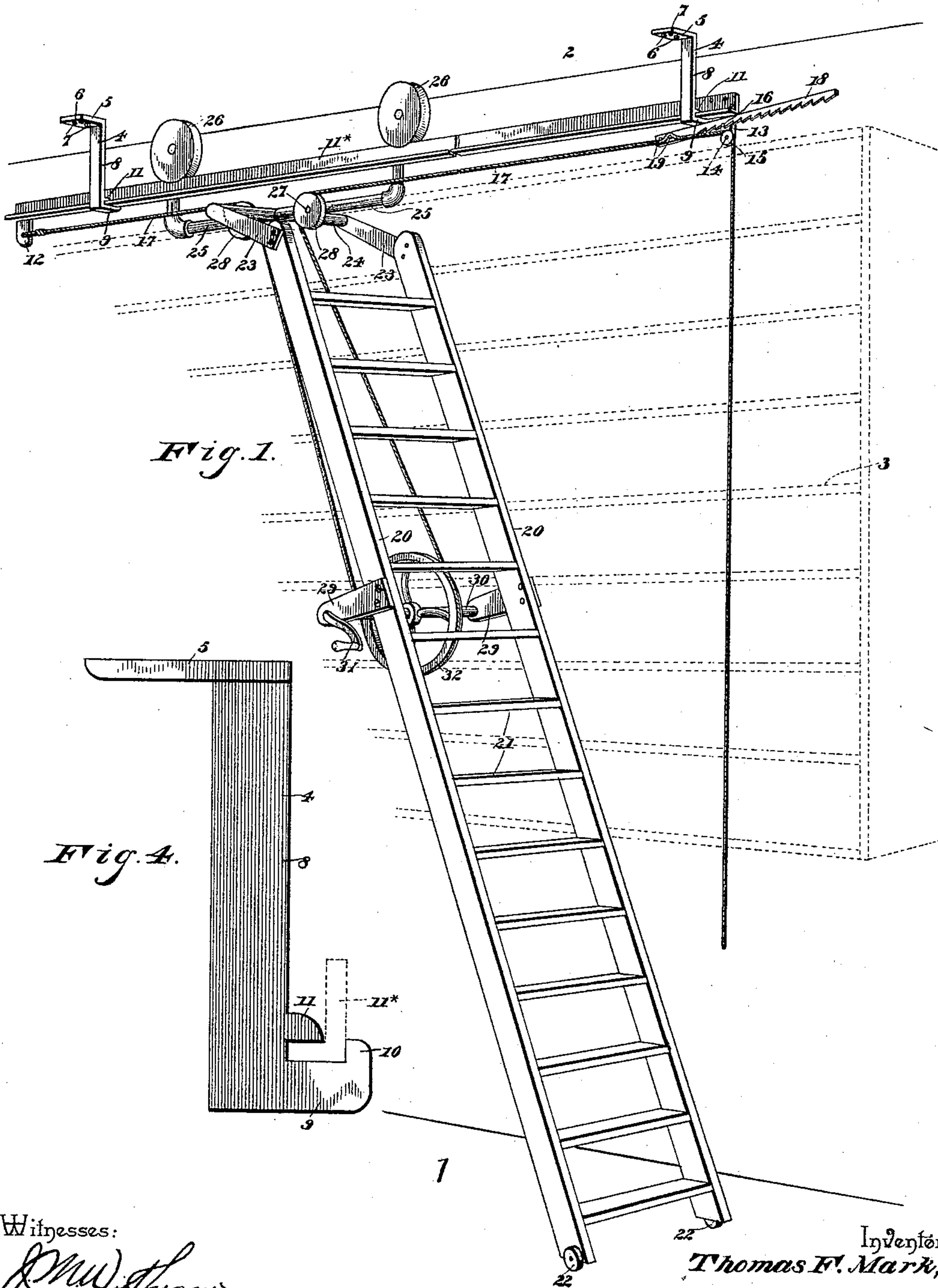
(No Model.)

2 Sheets—Sheet 1.

T. F. MARK.
LADDER.

No. 451,158.

Patented Apr. 28, 1891.



Witnesses:

J. W. Witherspoon
W. S. Duwall

By *his* Attorneys,

C. A. Snow & Co.

Inventor

Thomas F. Mark,

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

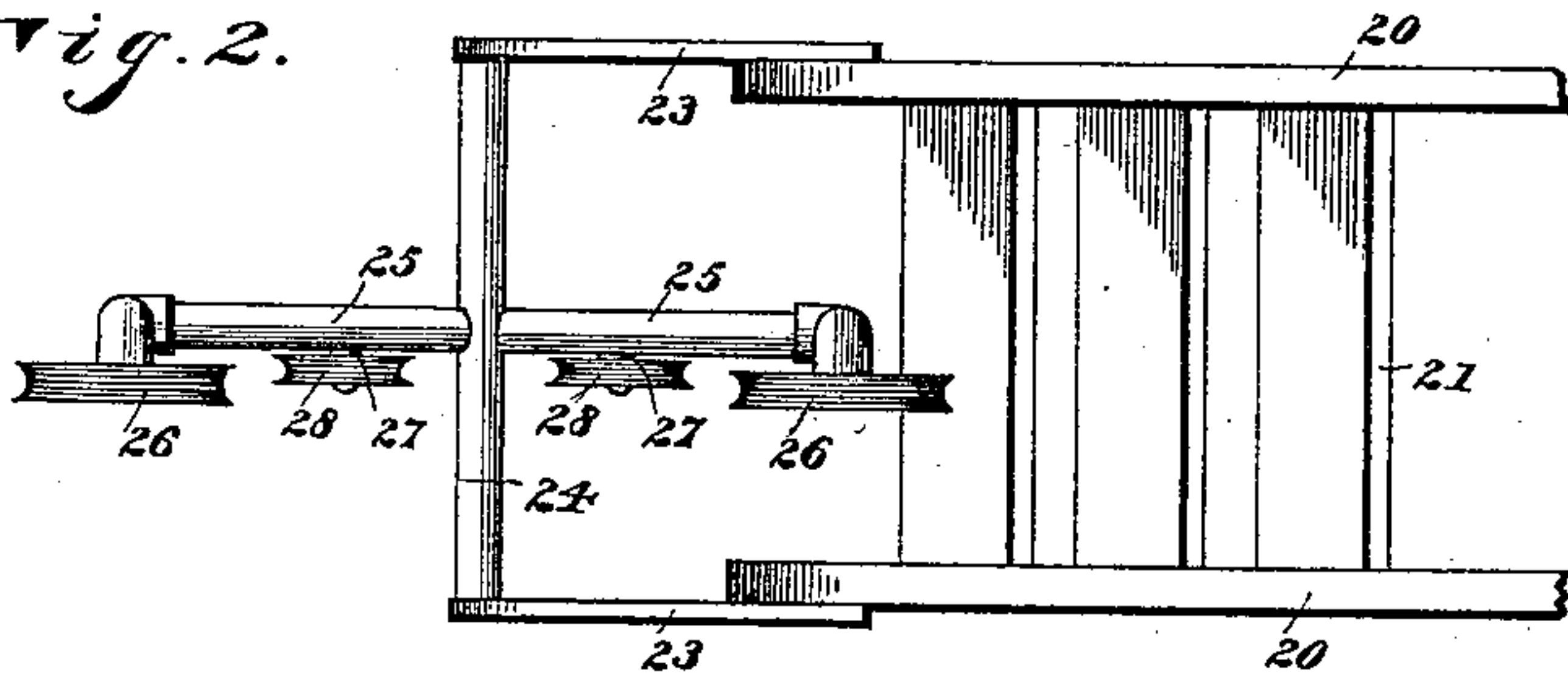


Fig. 3.

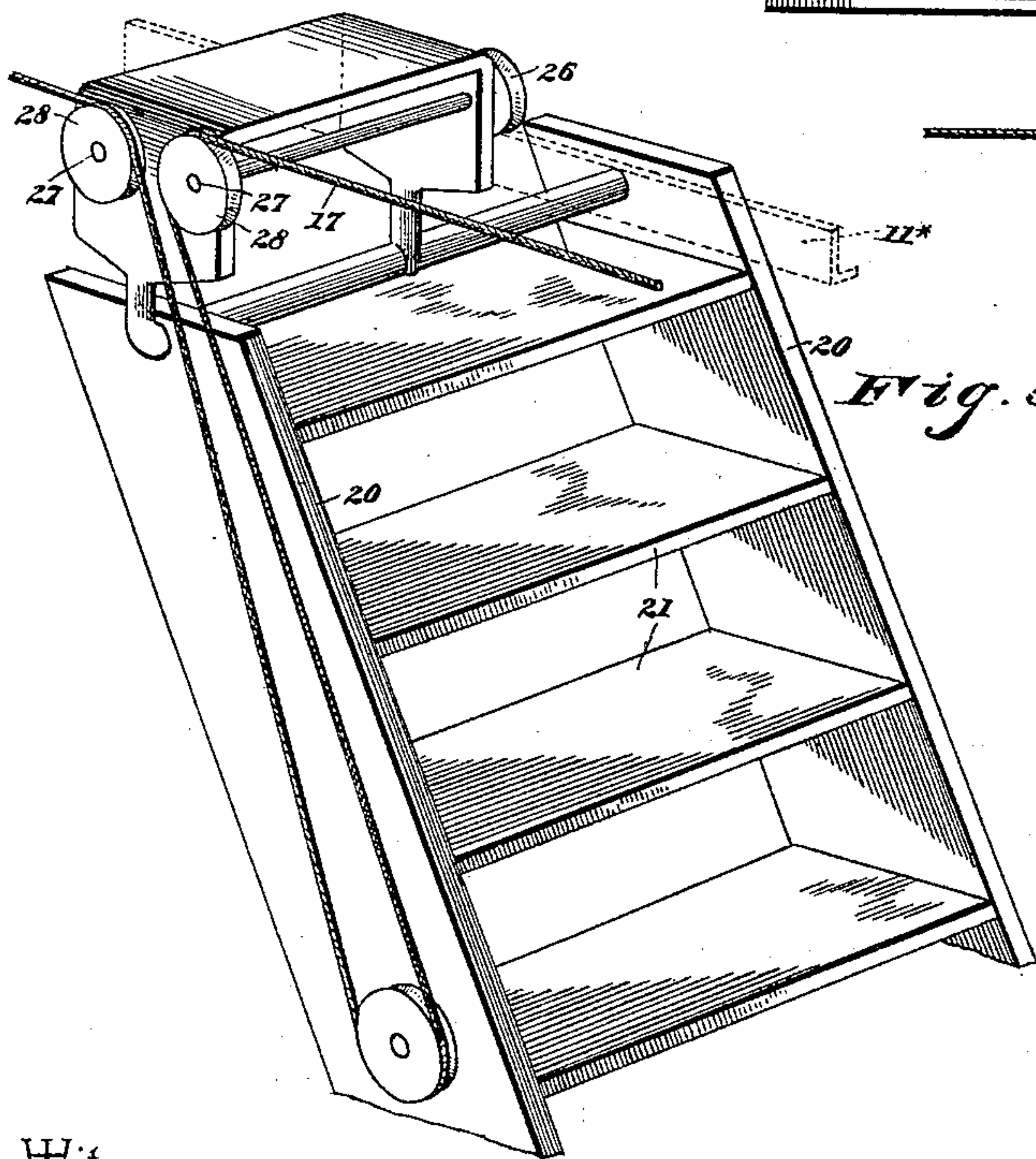
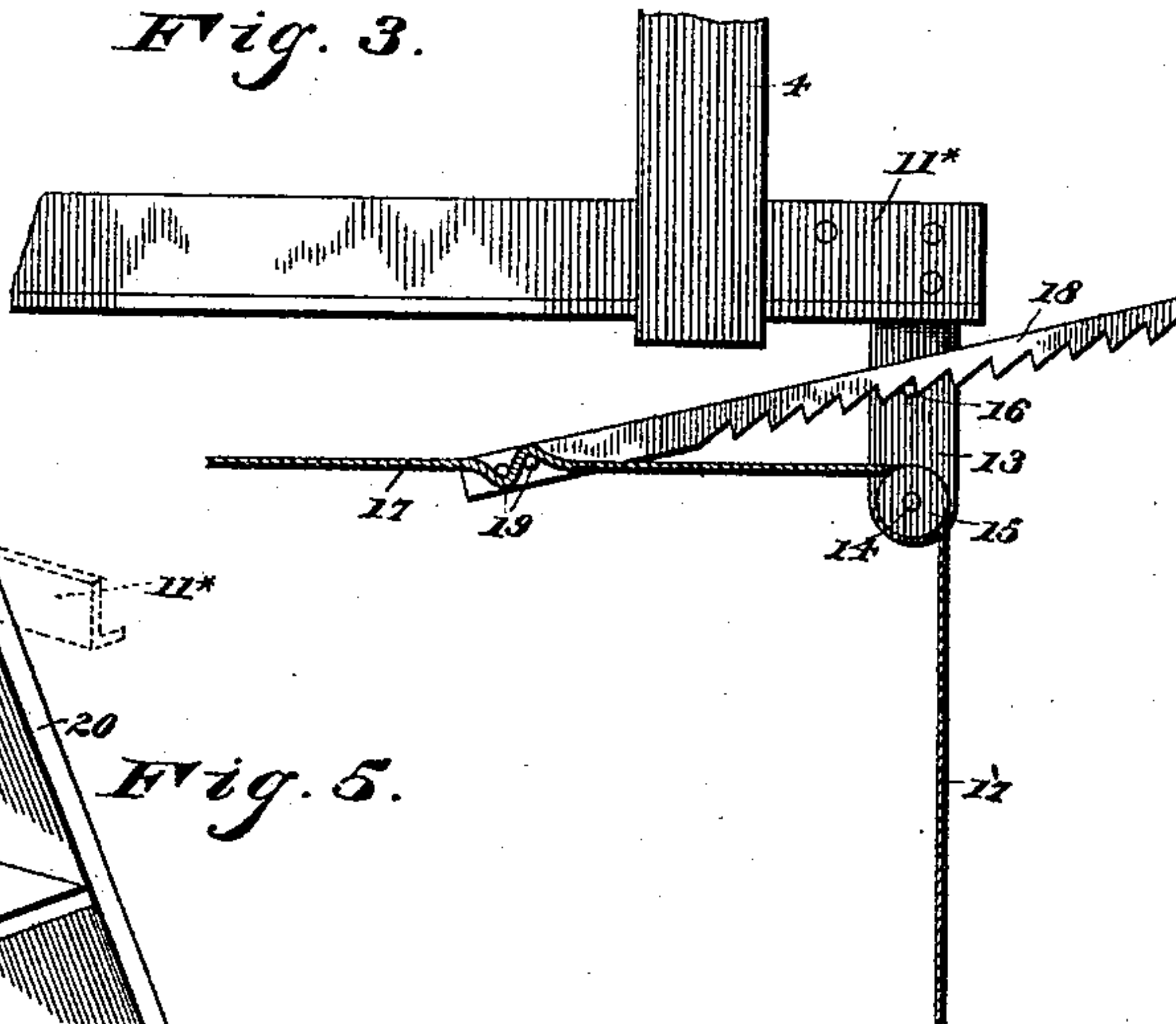


Fig. 5.

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UNITED STATES PATENT OFFICE.

THOMAS F. MARK, OF FREMONT, NEBRASKA.

LADDER.

SPECIFICATION forming part of Letters Patent No. 451,158, dated April 28, 1891.

Application filed December 5, 1890. Serial No. 373,681. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. MARK, a citizen of the United States, residing at Fremont, in the county of Dodge and State of Nebraska, have invented a new and useful Ladder, of which the following is a specification.

This invention has relation to improvements in ladders, and more particularly to that class of ladders employed in stores for affording access to the shelves.

The objects of the invention are to provide a ladder of suitable length which may be moved either from the floor or by a person from the ladder in any direction along the line of shelves and which will be so supported as not to interfere with the contents of the shelves.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective of a ladder constructed in accordance with my invention, the same being in position. Fig. 2 is an enlarged detail in top plan of the upper end of the ladder and its support. Fig. 3 is a detail in side elevation of one end of the track, illustrating the means for taking up the slack of the cable. Fig. 4 is a detail in elevation of one of the hangers for supporting the track. Fig. 5 is a perspective of a modified construction of ladder.

Like numerals of reference indicate like parts in all the figures of the drawings.

In the drawings, 1 designates the floor, 2 the ceiling, and 3 a series of shelves located at one side of a salesroom. At intervals there is secured to the ceiling a short distance from the shelves a hanger 4, there being a series of such hangers arranged in line with each other and each consisting of a securing-plate 5 at the upper end of the same, perforated, as at 6, to receive screws 7, which are passed in an inverted manner into the ceiling, furthermore in a depending hanging portion 8, at the lower end of which is formed a horizontally-disposed supporting-arm 9, terminating in a vertical lug 10, a similar lug 11 being located immediately above the arm 9, said arm and lugs 10 and 11 combining to form a seat or support for an L-shaped track 11*. The track 11* is provided at its ends

with depending arms 12 and 13, and in the latter upon a bearing-pin 14, located in and extending from the arm, is mounted a loose grooved pulley 15, and immediately above said pulley a pin 16. To the arm 12 is connected one end of a suitable cable 17, the opposite end of the cable being passed over the pulley 15 just mentioned and having its free end dangling therefrom.

18 designates a ratchet-bar, the teeth of which engage with the pin 16 of the arm 13, and said bar is provided at its front end with a pair of laterally-disposed binding-pins 19, between which the cable passes, said pins binding upon the cable by the formation of a kink, and in this manner the rack-bar is adjustably connected to the cable and may be adjusted upon the pin 16. In order to take up slack upon the cable it is simply necessary to draw upon the loose end of the same and the rack-bar will engage at a proper point with the pin 16. The teeth of the rack-bar are disposed toward the inner end of the same, so that they readily ride outwardly over the pin 16 and yet are locked against an opposite movement.

The ladder comprises the usual side pieces 20, connected by the rungs or steps 21, and in the lower ends of the side pieces are journaled a pair of rollers 22 to facilitate moving the ladder. From the upper ends of the opposite side pieces project a pair of arms 23, connected at their outer ends by a transverse bar 24, from which there project front and rear standards 25, in the upper ends of which are journaled trolley-wheels 26, which latter are flanged, as shown, and adapted to move over the track 11*. At each side of the transverse piece 24 there project from the standards 25 stub-shafts 27, upon each of which is mounted a flanged pulley 28. Some distance below the upper end of the ladder there project from the opposite sides of the same arms 29, in which is mounted a transverse shaft 30, which at one end is provided with a crank 31 and between the arms 29 with a flanged pulley 32, mounted rigidly thereon.

In practice the cable is slackened sufficiently to draw the same down between the pulleys 28, thus forming a loop, which is drawn under the pulley 32. It will be observed that the trolley supported by the track maintains

the latter in a raised position and at a proper inclination. After the cable has been placed in position about the pulleys said cable is drawn taut and locked in its taut position by the mechanism heretofore described and the latter is ready for operation. It will be observed that a person on the floor may push the ladder in either direction along the line of shelving, or a person may stand upon the ladder and by operating a crank 31 move the ladder in either direction, and by standing upon different steps or rungs may be brought opposite any tier of the series of shelves.

In Fig. 5 I show a modification of the construction just mentioned, and in the same I omit the crank-handle 31 and operate the cable by means of grasping the same at any point between the upper and lower pulleys and either drawing or raising thereupon. In this instance, also, I omit the trolley.

From the above it will be observed that I have provided a ladder that may be pushed along the entire line of shelving and that is supported independent of and some distance from the shelving, whereby it offers no obstruction to the ready removal or inspection of the contents of the shelves. Other constructions may be readily substituted and, in fact, will readily suggest themselves to the skilled mechanic, whereby practically the same results may be obtained without departing from the spirit of my invention.

Having described my invention, what I claim is—

1. The combination, with a track, a cable located under the same, and a ladder, of a trolley mounted on the track and an upper pair of pulleys and a lower pulley, said cable being looped between the upper pulleys and around the lower pulley, substantially as specified.

2. The combination, with a cable, of means for supporting the same, an inclined ladder, a pair of pulleys located at the upper end of the ladder, and a single pulley below and opposite the space between the pair, said cable being looped between the pair of pulleys and passing under the lower pulley, substantially as specified.

3. The combination, with the track terminating in depending arms, one of which is provided with a pulley and a pin, of a cable connected to one arm and passed over the pulley of the opposite arm, and a rack-bar having inwardly-disposed teeth for engaging the pin of the arm and connected at its inner end to the cable, substantially as specified.

4. The combination, with the track termi-

nating in depending arms, one of which is provided with a pulley and a pin, of a cable connected to one arm and passed over the pulley of the opposite arm, and a rack-bar having inwardly-disposed teeth upon its under side for engaging the pin of the arm and provided at its front end with laterally-disposed pins, between which the cable passes and upon which the pins bind, substantially as specified.

5. The combination, with the hangers terminating at their lower ends in the lateral arm 9, having the outer vertical lug 10, said hanger being provided above the arm with the horizontal lug 11, of the L-shaped track having its base embraced by the lugs 10 and 11 and arm 9, substantially as specified.

6. The combination, with the overhead track, its supports, said track terminating in depending arms, and a cable stretched between the arms parallel with the track, of a ladder having rollers at its lower end provided with rearwardly-extending arms, a transverse bar connecting said arms, front and rear standards projecting from the bar and provided with trolleys mounted upon the track, a second arm extending from the ladder below the first-mentioned arms, a flanged pulley journaled thereon, and a pair of pulleys journaled in bearings upon each of the standards of the wheels, said cable being looped between said pulleys and over the lower pulley, the shaft of the latter having a crank for operating the same, substantially as specified.

7. The arm 13, provided with pulley 15 and pin 16, combined with the cable 17, passing over the pulley, and the rack-bar, the teeth of which engage the pin, said rack-bar being provided with pins 19, between which the cable passes, as set forth.

8. The combination, with the supported track 11* and the cable 17, of the ladder mounted on wheels at its lower end, the trolley connected to the upper end of the ladder and provided with wheels to run on the track and also with pulleys over which the cable passes, and a wheel or windlass mounted on the ladder below the upper end and connected with the cable to propel the ladder along the floor, as set forth.

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

THOMAS F. MARK.

Witnesses:

ANSON W. ATWOOD,

H. C. THOMAS.