No. 891,379. PATENTED JUNE 23, 1908.

F. E. SCOTT.

COMBINATION LADDER.

APPLICATION FILED SEPT. 21, 1907.

2 SHEETS—SHEET 1.

Fig. 8.

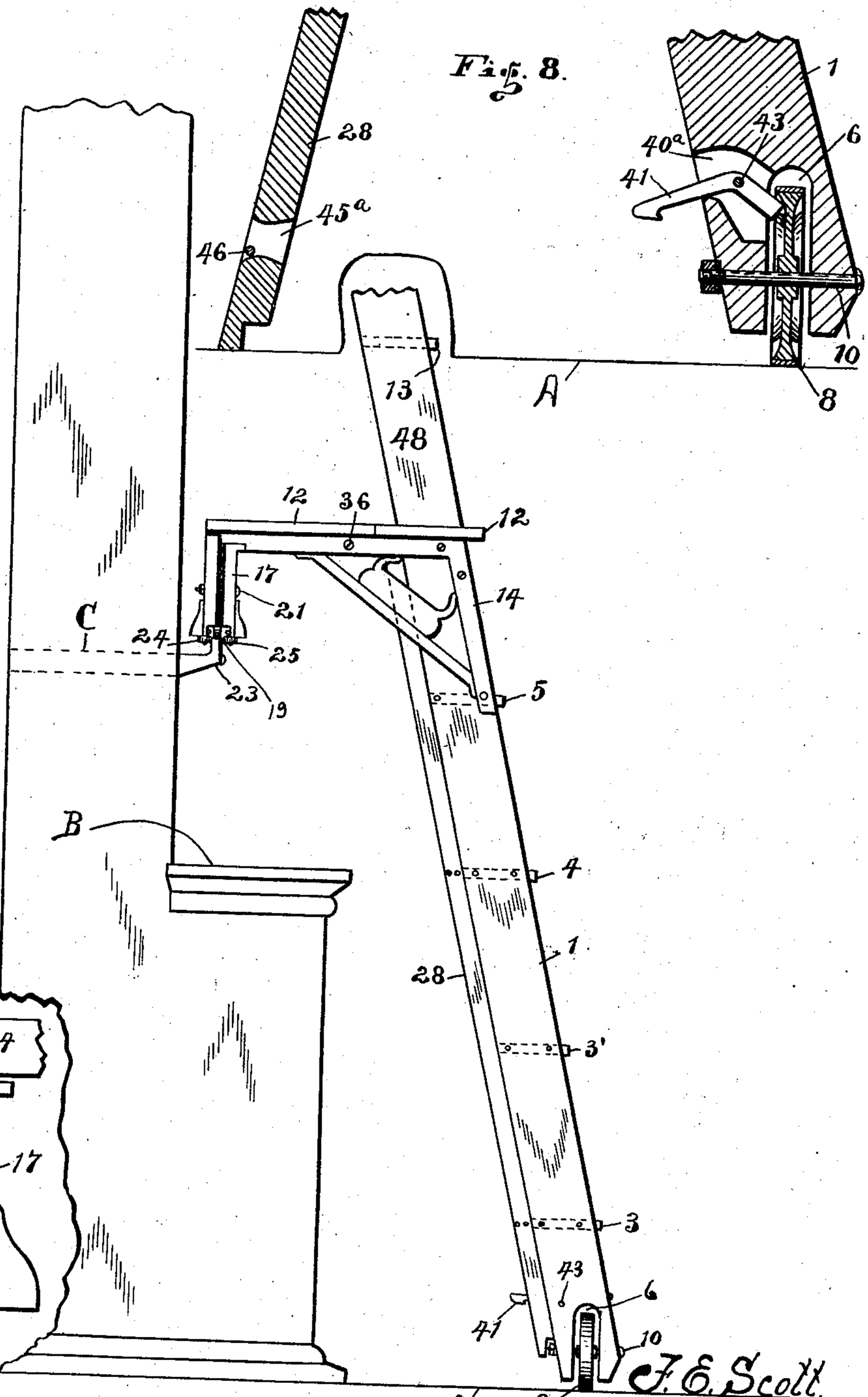
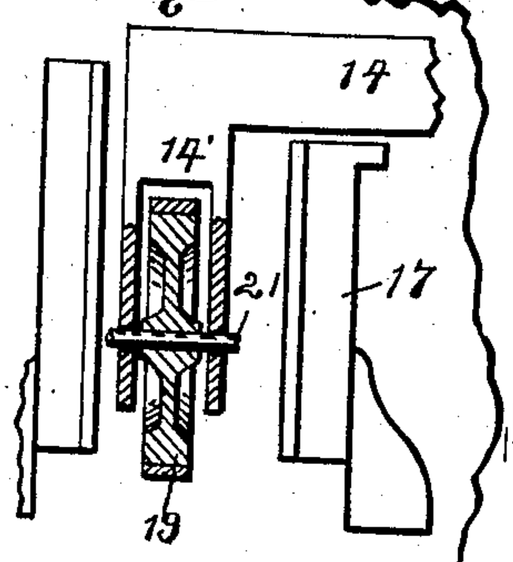


Fig. 9.



Witnesses:
Adelaide Kearns.
M. E. Handly.

Fig. 1.

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2 SHEETS—SHEET 2.

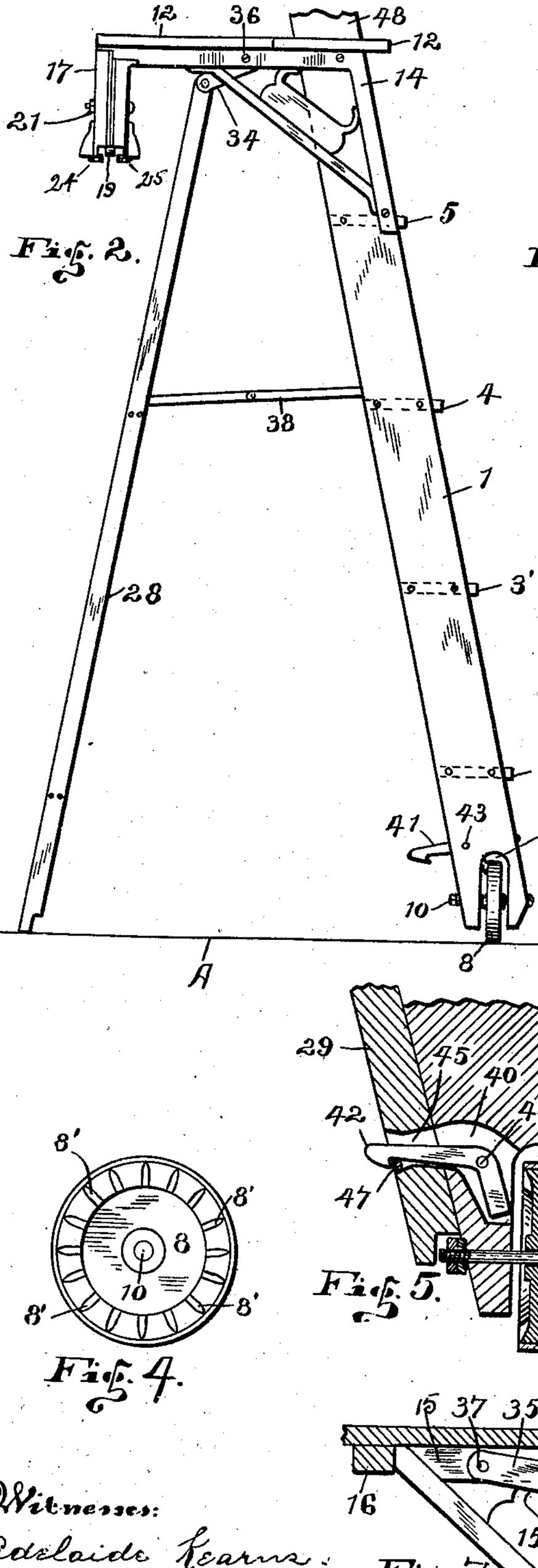

Fig. 2.

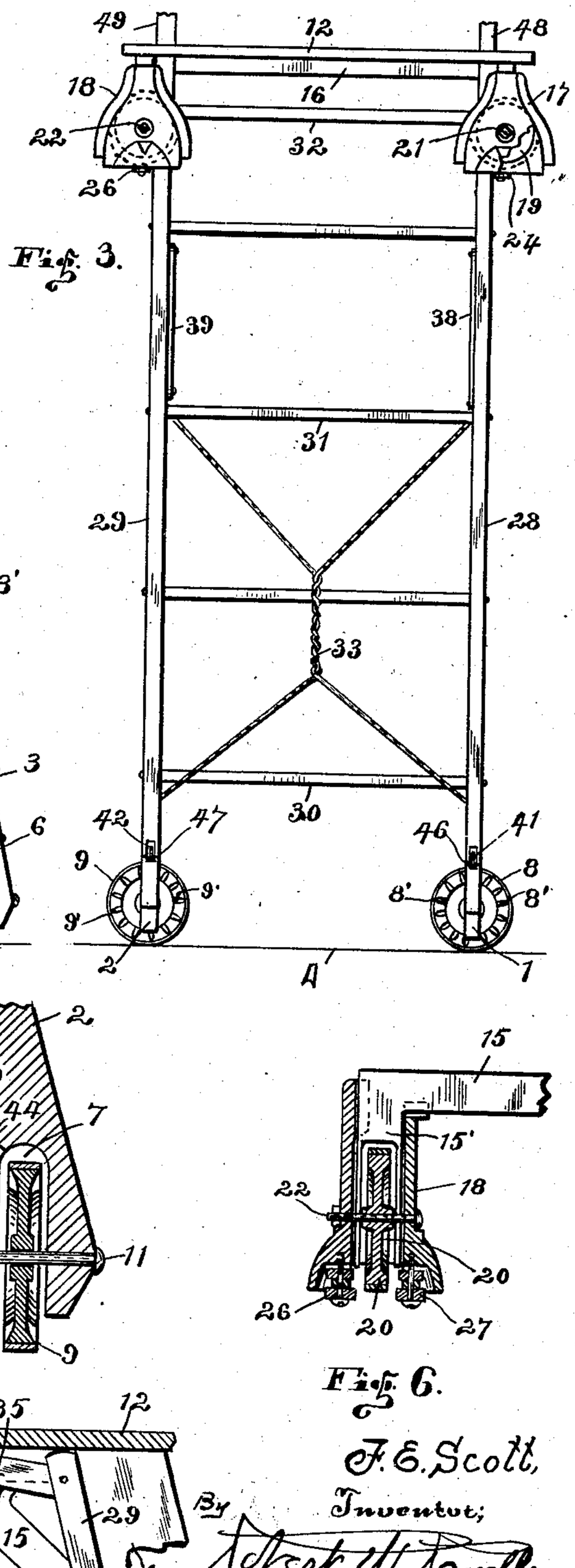

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

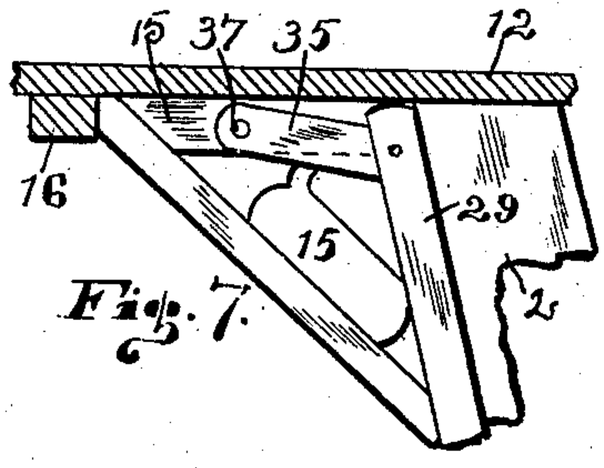

Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANCIS E. SCOTT, OF CENTERVILLE, INDIANA.

COMBINATION-LADDER.

No. 891,379. Specification of Letters Patent. Patented June 23, 1908.

Application filed September 21, 1907. Serial No. 393,881.

To all whom it may concern:

Be it known that I, FRANCIS E. SCOTT, a citizen of the United States, residing in Centerville, in the county of Wayne and State of Indiana, have produced certain new and useful Improvements in Combination-Ladders, of which the following is a complete specification.

This invention relates more particularly to a combined store service ladder and a step-ladder, to be used interchangeably.

The object of my present invention, broadly speaking, is to provide a construction which will be highly efficient as a store service ladder, being mounted on carrying wheels and operable in connection with shelving or the like, at the same time being convertible into an ordinary step ladder adapted to stand stationary and be self supporting.

The invention lies in the combination of store-service ladder and an ordinary step-ladder, and in the several details of construction which will hereinafter be fully pointed out, and features which are new will be correlated in the appended claims.

The preferred manner for the construction of this invention, and that which in practice has been found to be the most desirable, is shown most clearly in the accompanying two sheets of drawings, in which—

Figure 1 is a side elevation of my invention in operative position as employed as a store-service ladder, being shown in connection with ordinary store shelving. Fig. 2 is a side elevation of the same in operative position when employed as an ordinary step-ladder. Fig. 3 is a rear elevation of my ladder folded. Fig. 4 is a face view of one of the floor wheels. Fig. 5 is a detail vertical section of the lower portion of one side of the ladder. Fig. 6 is a detail vertical section of one of the upper roller bearings. Fig. 7 is a detail vertical cross section of the upper portion of my ladder. Fig. 8 is a detail vertical section of one side of the ladder, showing the legs opened back from the standards. And Fig. 9 is a detail vertical section of the complementary parts from that shown in Fig. 6, and showing the housings therefor separated therefrom.

Similar reference characters denote like parts throughout the several views of the two sheets of drawings.

In order that the construction and operation of my invention may be more fully understood and comprehended I will now take up a detailed description thereof in which I will set forth the same as briefly as I may.

Referring now to the drawings in detail: The letter A designates the floor line of a room, while the letter B denotes the ordinary base-shelf, and the letter C denotes one of a plurality of shelves above the base, said parts being shown merely in order to explain one manner of using my invention.

The numerals 1 and 2 designate the main standards, or sizes, of my ladder, which parts are spaced and connected by a plurality of steps, as indicated by the characters 3, 3′, 4 and 5. Formed laterally in the lower ends of the respective standards are the vertical slots 6 and 7 in which are revolubly mounted the respective floor-wheels 8 and 9 which are carried on their respective axles 10 and 11. The peripheries of the said wheels should be tired with resilient material, as rubber or leather.

The numeral 12 denotes the horizontal top of the ladder proper, which top extends back some distance beyond the standards, it being understood that the standards are to be inclined at an angle, substantially as shown when they are in operative position.

Secured to the outer faces of the upper ends of the standards and extending back to near the rear edge of the top 12 are the respective brackets 14 and 15, which support the shelf to which they are secured.

The standards 1 and 2 may be extended up, through the top 12, any desired distance above the top 12 forming the extensions 48 and 49, respectively, and these extensions are connected by a plurality of steps, as the step 13 for instance, as shown in Fig. 1.

Contacting with the underside of the top 12 and extending between the brackets 14 and 15, is a cleat 16, which is, primarily for the purpose which will hereinafter be referred to.

From the rear ends of the brackets, above referred to, there extends down at right angles thereto, and integral therewith, the forks or hangers 14′ and 15′, each having a pair of prongs between which are revolubly mounted the track-wheels 19 and 20, respectively, each being mounted on its respective shaft-bolt 21 and 22. The numerals 17 and 18 denote, each, a two-part housing, each having an interior space opening downward. The upper ends of each member of the two pairs of housings are notched in engagement with the rear

portion of the respective brackets, and are held in place by the respective shaft-bolts 21 and 22 above referred to, as shown in Fig. 6. The peripheries of said wheels 19 and 20 should be covered with a resilient tire to contact with the track 23, which track is secured to the edge of one of the shelves C, from which it extends outward and then upward, as shown in Fig. 1, being substantially L-shaped in cross section. Located on each side of each of the wheels 19 and 20, revoluble at right angles thereto, and mounted on headed shafts therefor, are the guide-rollers 24 and 25 for the one, and 26 and 27 for the other. Said guide rollers are formed, preferably of leather or the like and they extend down slightly below the lowest points of their respective guide-wheels, and centrally of their respective housings to which they are connected as shown in Fig. 6. Each pair of said guide-rollers is adapted to contact with the opposite sides of the upwardly extending portion of the track 23 as shown.

The numerals 28 and 29 designate legs rigidly connected together by the cross bars 30, 31 and 32, and they are further secured by the wire braces 33 as shown in Fig. 3. The upper ends of said legs are eccentrically and pivotally mounted as follows: The numerals 34 and 35 denote links for the respective legs, one end of each being pivotally secured to the inner face, and near the center of the horizontal portions of the brackets 14 and 15, by the respective bolts 36 and 37. The other end of said links are pivoted to the outer face of the upper end portion of the respective legs 28 and 29. The length of said links are such that the forward faces of the legs may be contacted with the rear edges of the standards 1 and 2, as shown in Figs. 1 and 7; or they may be moved back to where the upper ends of the legs will contact with the underside of the cleat 16, in order that the construction may be used as an ordinary step-ladder, in which position it is shown in Figs. 2 and 8.

The standards 1 and 2 are connected, near their central portions, to the respective legs 28 and 29 by pivoted folding arms 38 and 39. Said arms are adapted to retain the legs apart and in proper relations to the standards 1 and 2 when the construction is to be employed as a step-ladder, as shown in Figs. 2 and 8, or to be folded in when the legs and standards are contacted together as in Figs. 1, 5 and 7.

A vertical slot or aperture is formed in the lower portion of each of the standards 1 and 2, the one in the standard 2 being shown most clearly in Fig. 5 and is designated by the numeral 40; while the one in standard 1 is shown most clearly in Fig. 8, being designated by 40^a. Said slots extend from the rear edge of the standards forwardly into the upper portions of the slots 7 and 6, respectively, which are at right-angles thereto. In each of said slots is pivoted a hook-arm 41 and 42, being pivoted on the respective bolts 43 and 44 which extend therethrough. Formed in the rear faces of the floor-wheels 8 and 9, near their peripheries, and located radially therearound, are a plurality of notches, 8′ and 9′ respectively, as indicated in Figs. 3 and 4. The inner or forward ends of the hook-arms 43 and 44 are adapted to engage in said notches of the respective wheels 8 and 9 at such times as when the outer hook portion of said hook-arms are down, as shown in Fig. 8; or to be disengaged therefrom when the legs are in contact with the standards as shown in Fig. 5. Formed through each of the legs 28 and 29 is a slot, that in the leg 29 being shown in Fig. 5 and indicated by the numeral 45; and that in the leg 28 being designated by 45^a as shown in Fig. 8. Said slots 45 and 45^a are located opposite the corresponding slots in the standards as shown in said views, and the rear hook portion of said hook-arms are movable through said slots 45 and 45^a, as shown in Fig. 5. Secured across the lower portion of each of said slots 45^a and 45, on the rear faces of the legs 28 and 29 is a catch 46 and 47, respectively, over which may engage the hook of the members 41 and 42 respectively as shown in the drawings.

From the above it is apparent that when the invention is to be used as a shelf-ladder, as in Fig. 1, that the legs are placed back parallel and in engagement with the standards where they will be retained by the hook-arms 41 and 42, this engagement will of course retain the hook-arms out of engagement with the floor-wheels and allow them to revolve freely on the floor.

When used as an ordinary step-ladder then the legs are moved back to the position shown in Fig. 2, this of course will release said hook-arms allowing their rear portion to drop down by gravity and causing their inner end portion to engage in the notches of the floor wheels, thereby locking the floor wheels as shown in Figs. 2 and 8.

Various changes may be made in the details of construction herein shown and described without departing from the spirit of my invention.

Having now fully shown and described my invention and the best means for its construction to me known at this time, what I claim and desire to secure by Letters Patent of the United States, is—

1. A combination ladder having means whereby it may be employed as a movable shelf-ladder and also as an ordinary step-ladder, the combination of the standards connected by steps, wheels mounted to the lower ends of the standards, brackets secured to the upper portion of the standards, track wheels carried by said brackets; a pair of legs connected together by intermediate means and connected at their upper ends by

links to the upper portion of the ladder, means whereby the legs may be secured out of operative position in contact with the standards and whereby the legs may be located away from the standards and in operative position at angles opposite to the inclination to the standards, all substantially as shown and described and for the purposes set forth.

2. A combination ladder having standards connected by steps, floor wheels mounted to the lower ends of the standards, brackets extending back from the central portions of the standards, a shelf extending back from the standards and resting on said brackets, track wheels connected to the rear portions of the brackets, housings surrounding said track-wheels, guide wheels located on each side of each of said track wheels, a permanent extension extending above said shelf, a pair of legs connected together and in alinement with the standards, links by which the upper ends of the legs are connected to said brackets and by which the upper ends of the legs may be moved forward and backward, hook-arms for connecting the lower ends of the legs to the lower ends of the standards, and means whereby said hook-arms will engage and hold the floor-wheels when the legs are moved away from the standards, all substantially as shown and described.

3. A ladder having a shelf, an extension rising above the shelf, floor-wheels for the lower part of the ladder, track wheels for the upper part of the ladder, a permanent track independent of the ladder, antifriction means for retaining the track wheel in engagement with said track, a pair of legs movable bodily away from the ladder proper and connected thereto by links at the upper ends, hook-arms at the lower portions of the ladder for holding the legs against the ladder proper and for locking the floor wheels when the legs are moved back from the ladder proper, all substantially as shown and described.

In testimony whereof I have hereunto subscribed my name to this specification in the presence of two subscribing witnesses.

FRANCIS E. SCOTT.

Witnesses:
R. E. RANDLE,
R. W. RANDLE.