

(No Model.)

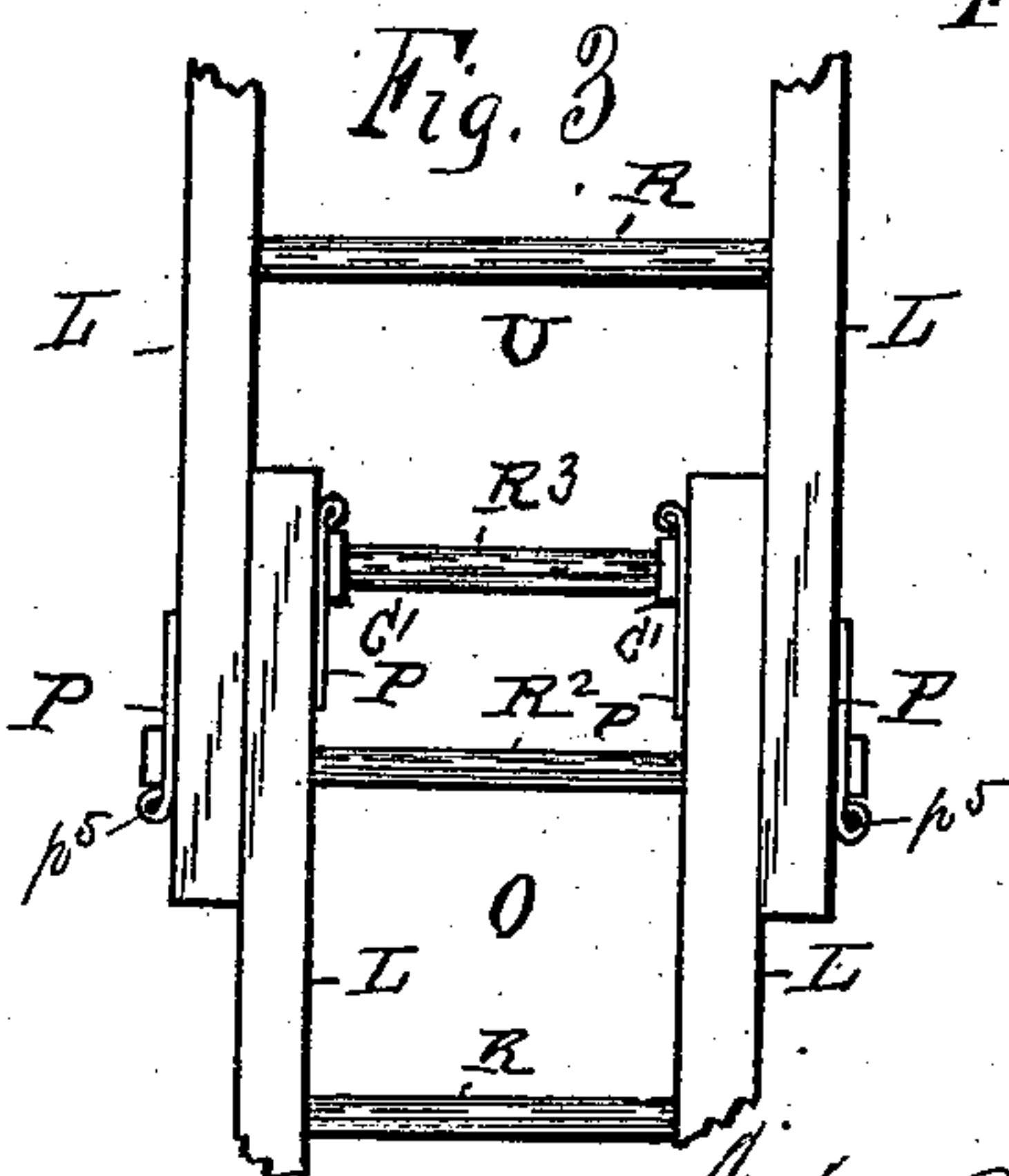
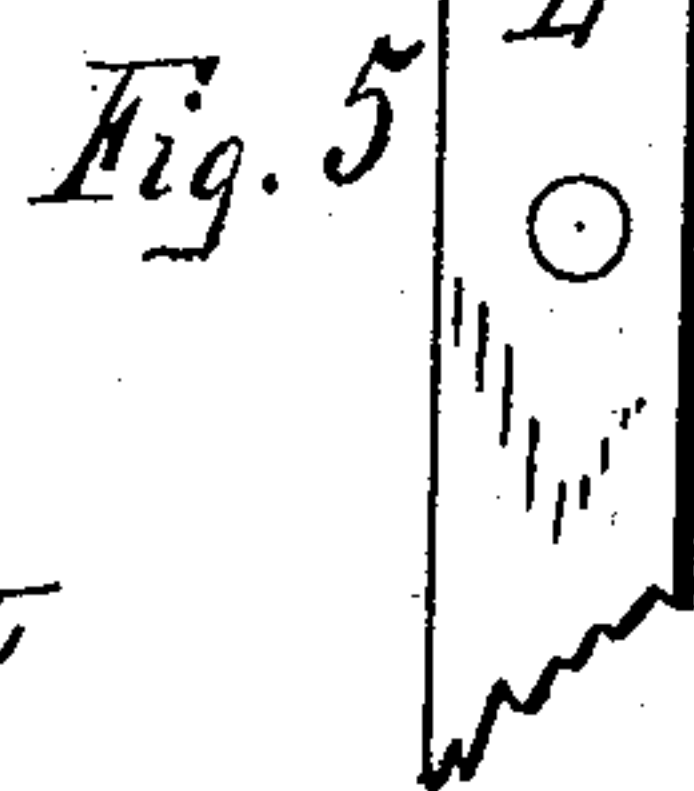
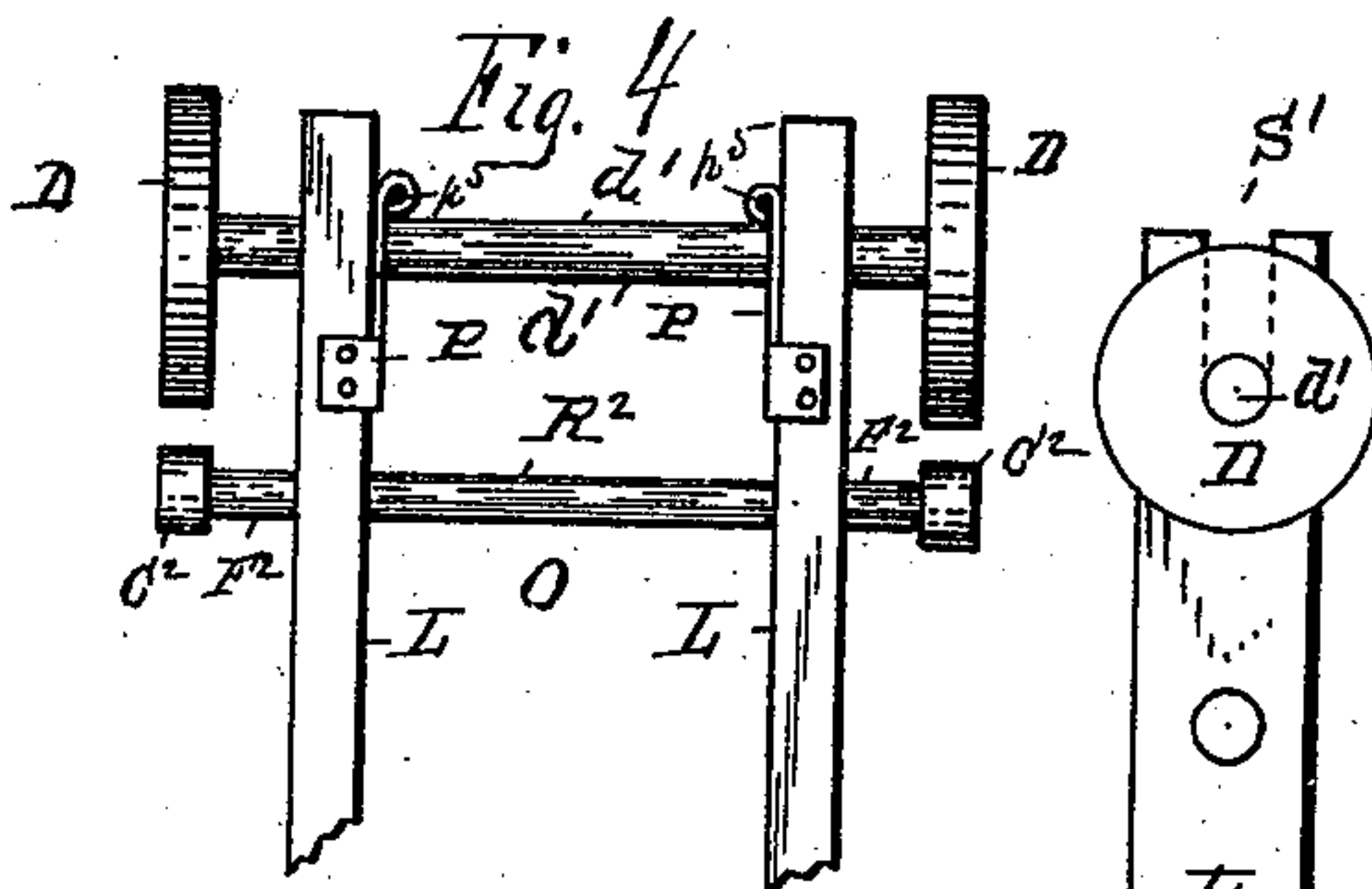
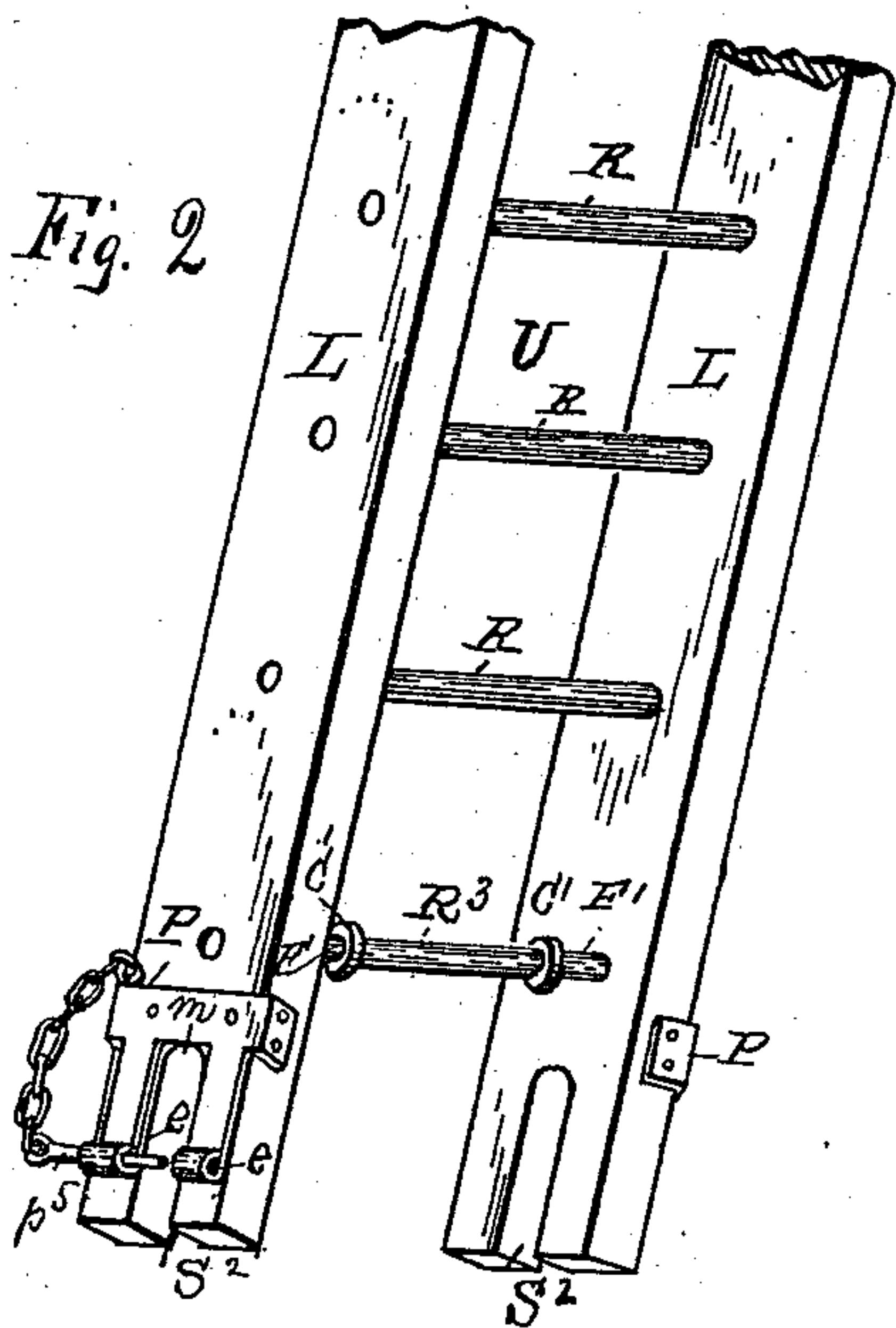
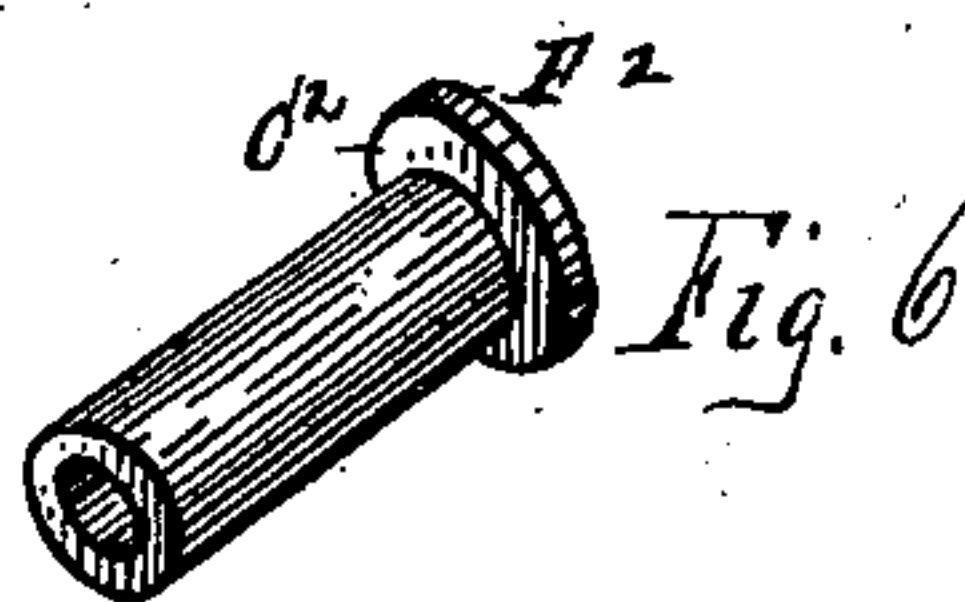
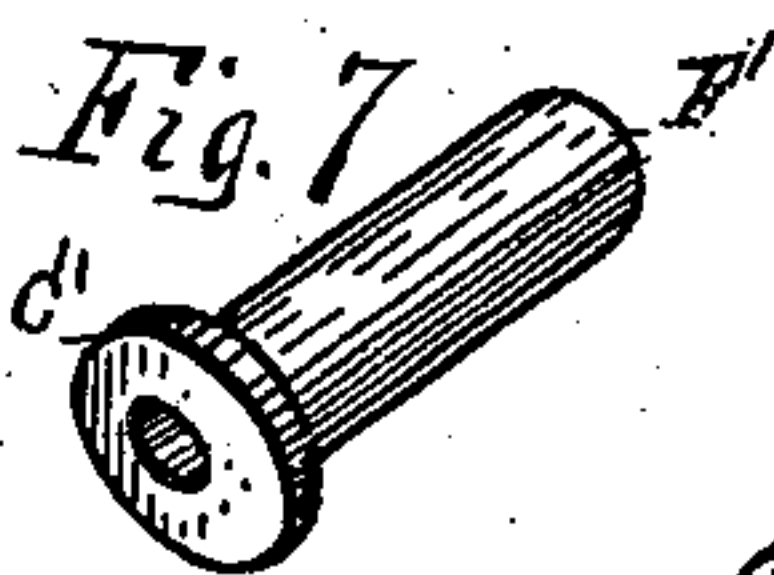
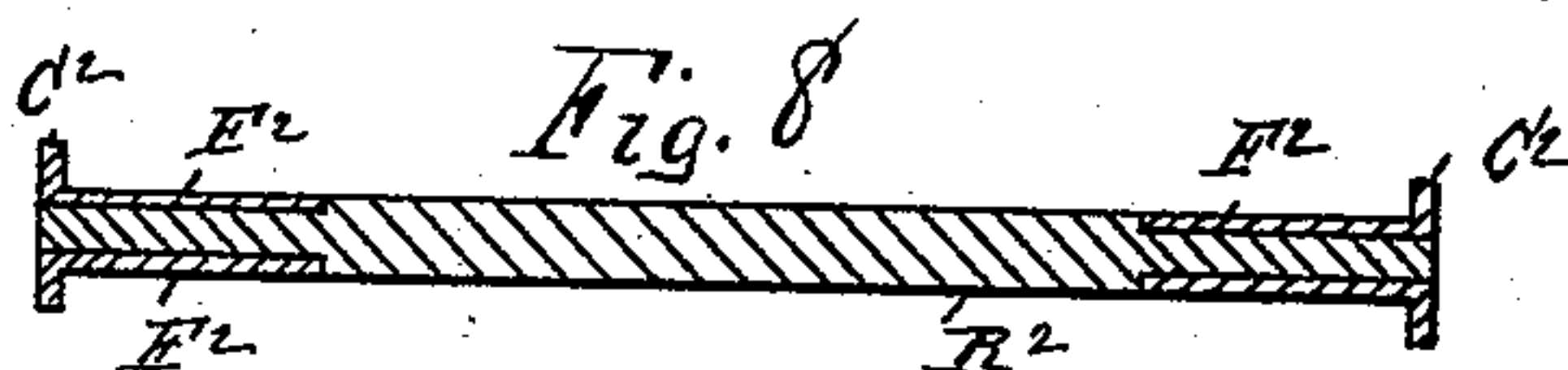
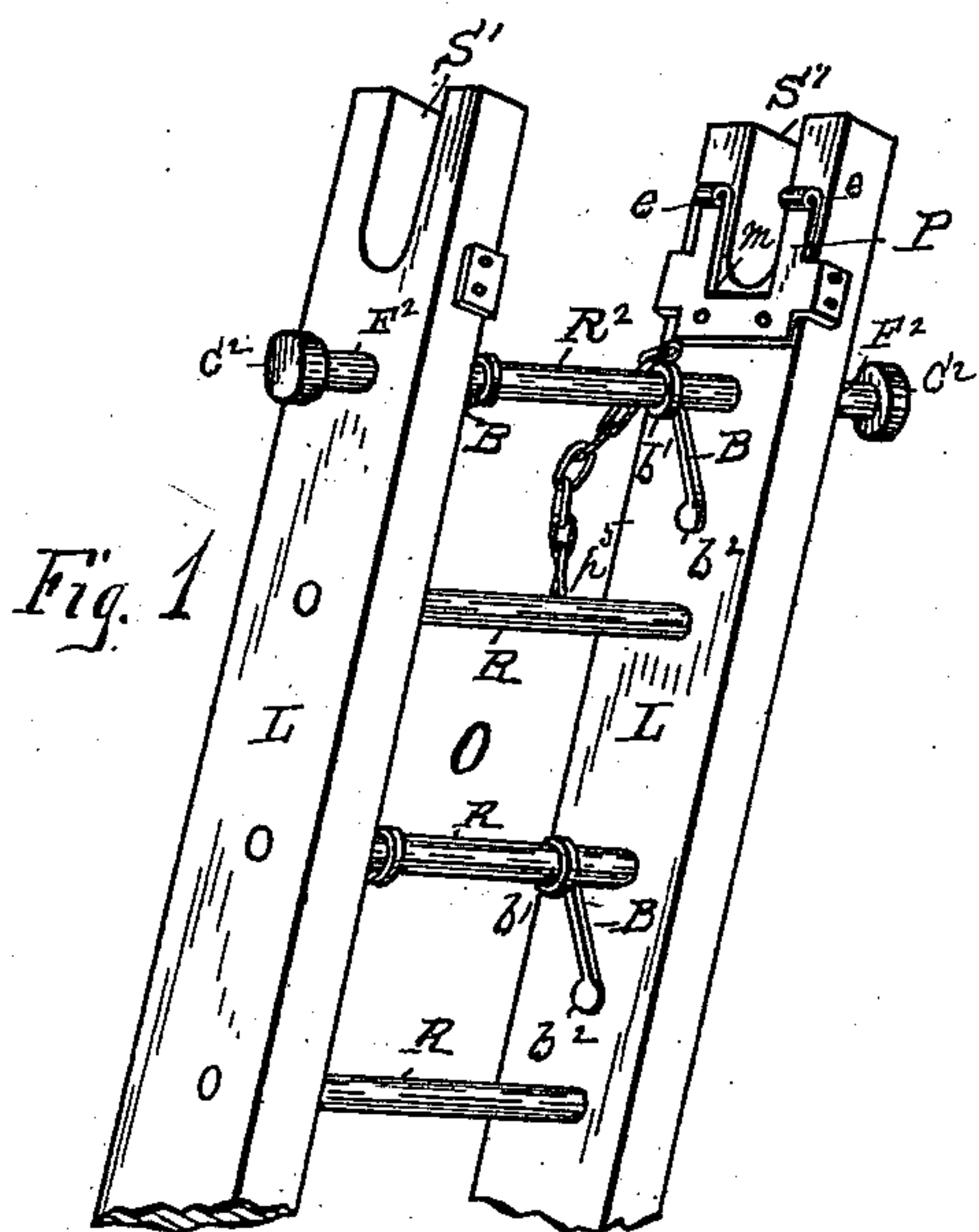
2 Sheets—Sheet 1.

J. S. TILLEY.

LADDER.

No. 355,574.

Patented Jan. 4, 1887.



WITNESSES:

Geo. A. Derby.

Charles S. Brintnall

INVENTOR

John S. Tilley
by W. C. Hagan his atty

(No Model.)

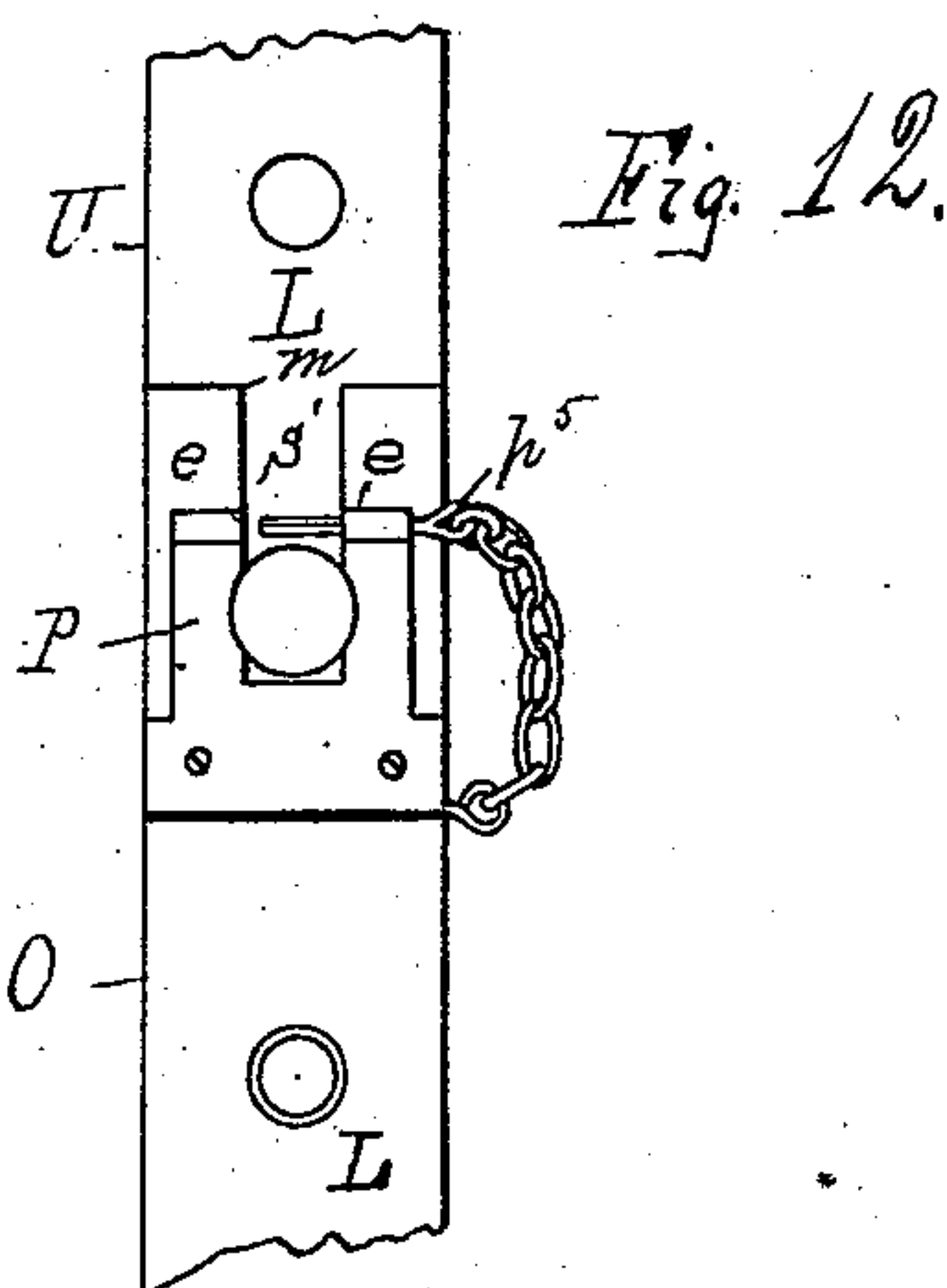
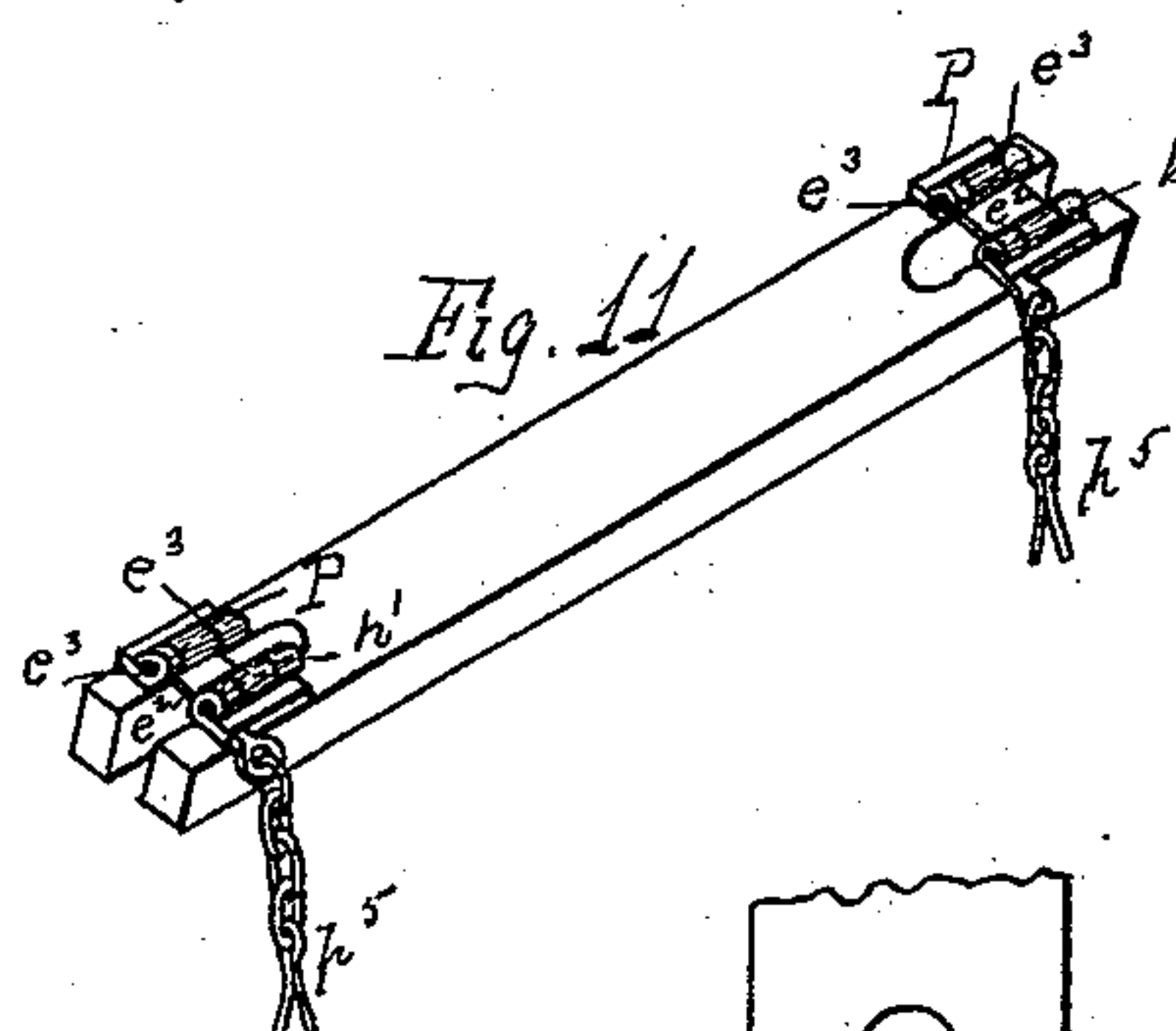
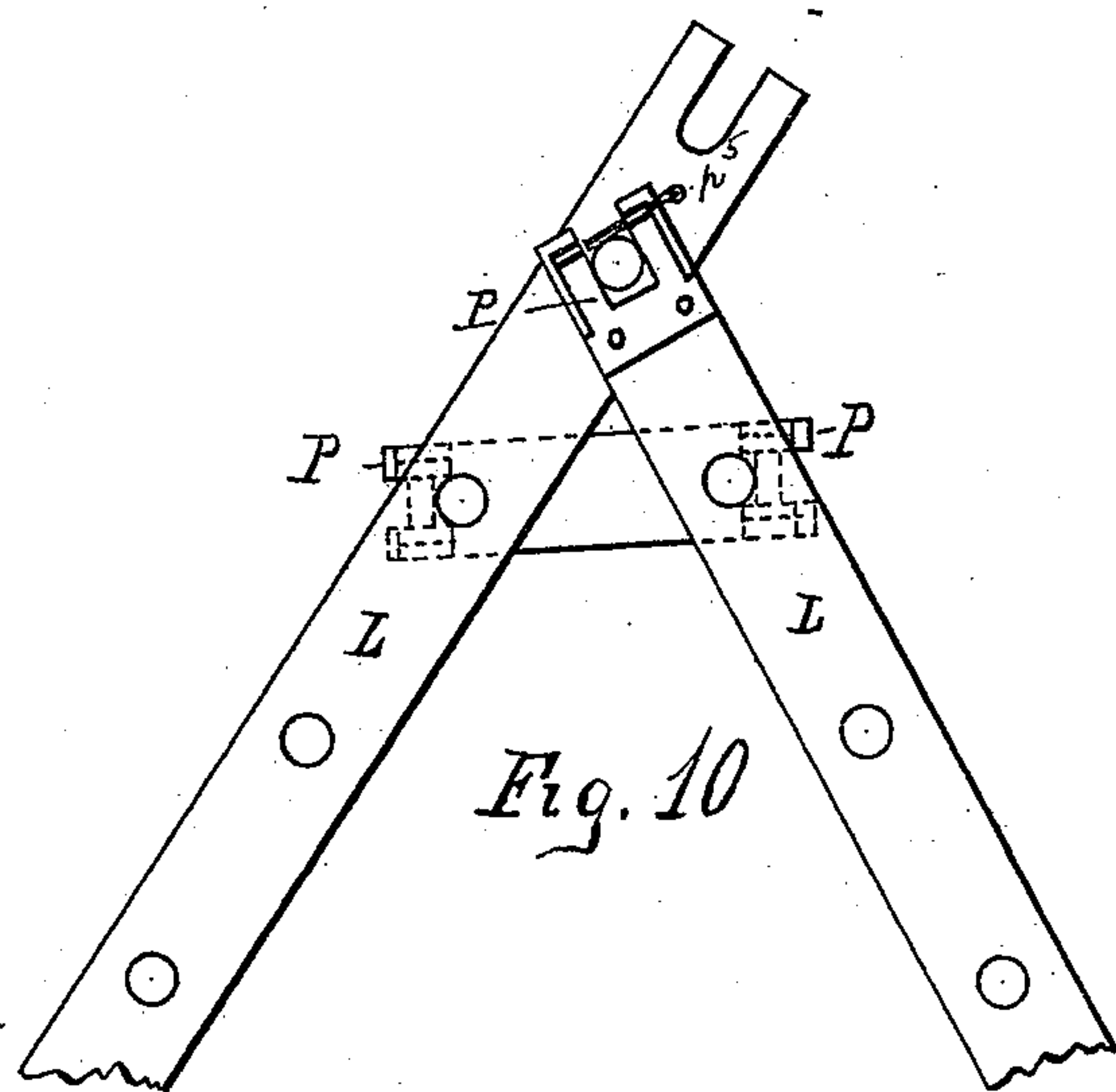
2 Sheets—Sheet 2.

J. S. TILLEY.

LADDER.

No. 355,574.

Patented Jan. 4, 1887.



WITNESSES:

Geo. A. Darby.

Charles S. Brintnall

INVENTOR

John S. Tilley

by W. E. Hagan his atty

UNITED STATES PATENT OFFICE.

JOHN S. TILLEY, OF WEST TROY, NEW YORK.

LADDER.

SPECIFICATION forming part of Letters Patent No. 355,574, dated January 4, 1887.

Application filed July 14, 1886. Serial No. 208,042. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. TILLEY, of the village of West Troy, county of Albany, and State of New York, have invented a new and useful Improvement in Ladders, of which the following is a specification.

My invention relates to ladders and an improved means for connecting sections or lengths of the latter, as well as an applied means to strengthen the connection made between the rounds and the ladder-sides, and also to adapt long lengths of a ladder to be run up against the side of a building with ease.

Accompanying this specification, to form a part of it, there are two plates of drawings, containing twelve figures, illustrating my invention, with the same designation of parts by letter reference used in all of them.

Of these illustrations, Figure 1 shows a perspective of a ladder-length with its upper end adapted to connect with another ladder-length by means of my invention. Fig. 2 shows a ladder-length with its lower end adapted to connect with the upper end of the ladder-length shown at Fig. 1. Fig. 3 shows the ladder-lengths illustrated at Figs. 1 and 2 as connected. Fig. 4 shows the application to the slotted upper ends of ladder-sides of rollers mounted on a shaft, with the latter arranged in the oppositely-placed slotted ends of the ladder-sides, and the same mechanism that is shown at Fig. 3 as securing the connected ends of the ladder-lengths in this figure shown as retaining the rollers and shaft in position within the slots. Fig. 5 is a side elevation of the mechanism shown at Fig. 4. Fig. 6 is a perspective of a ferrule used on the top round of a ladder connecting length. Fig. 7 is a perspective of a ferrule used on the bottom round of a connecting ladder-length. Fig. 8 is a longitudinal vertical section of the top round and ferrule of a connecting ladder-length; and Fig. 9 is a longitudinal vertical section of the lower round and ferrule of a connecting ladder-length, the parts illustrated at Figs. 6, 7, 8, and 9 being shown in a larger size and proportion than the same parts are illustrated in Figs. 1, 2, and 3. Fig. 10 shows a scaffolding or step-ladder produced from two ladder-lengths containing my invention, and a cross-brace applied thereto, constructed to connect the ends of said brace with the opposite rounds of two

ladder-lengths by a modification of the means shown at Figs. 1, 2, and 3, used to connect two ladder-lengths. Fig. 11 shows a perspective of the modification shown at Fig. 10. Fig. 12 shows a side view of the parts as connected at Fig. 3.

The several parts of the apparatus thus illustrated are designated by letter reference, and the function of the parts is described as follows:

The letter U designates what is the upper length and O what is the lower length of the ladder when these two ladder-lengths are connected.

The letters L indicate the sides or ladder rails, R the rounds or rungs, S' a slot made in the upper end of the sides of a connecting ladder-length, and S² a slot made in the lower ends of each of the sides of a lower connecting ladder-length.

The letter R² indicates the upper round of the lower ladder-length, and R³ the lower round of the upper connecting ladder-length.

The lower round, R³, of the upper ladder-length is made with a metal ferrule, F', which encircles the round at each end and is driven with it into and from the inner and opposite sides of the ladder part thereat. This ferrule F' is made with a collar, C', near each of its ends, and each of which collars is at a sufficient distance from the adjacent side of the ladder to admit of the passage between it (the collar) and the ladder-side of one of the ends of the lower connecting ladder-length, so that the latter at each side will be kept in place between one of the said collars and the outer ladder side thereat.

The upper round, R², of the connecting lower ladder-length is made with a metal ferrule, F², that is driven onto the end of said round R³ where oppositely projecting beyond each of the ladder-sides thereat. This ferrule F² is also provided with a collar, C², on each of its outer ends, there being sufficient distance between each of the said collars and the ladder outer sides thereat for the passage between said collars and the latter of the downwardly-projected lower ends of the upper connecting ladder-length.

The letters P designate securing-plates, one of which is made to attach to the inner and opposite sides of the lower ladder-length, and

the other to attach to each of the lower ends and outer sides of the upper ladder-length. Each of these plates P has a slot, m , made centrally therein, the sides of which slot are arranged coincidently with the slot in the connecting ends of the sides of the ladder-lengths where these plates are attached to the latter. These plates P each have eyes $e e$, and are provided with a cotter-pin, p^5 , adapted to be inserted within said eyes, as shown at Figs. 1, 2, 3, 4, and 12. The function of these plates P is to secure the connecting lengths of the ladder together and to give additional strength to the connection.

In the modification of the plate P shown at Figs. 10 and 11 a latch-plate, hinged at h' , is used with the cotter-pin end e^2 of said latch, constructed to drop in between the eyes $e^3 e^3$, so that the cotter-pin p^5 may be passed in through the eyes $e^3 e^3$ and the intermediate eye, e^2 , on the hinged latch-plate p^3 .

The ladder-lengths U and O thus made are connected as follows: The lower end of the upper ladder-length, U, is passed down outside of the upper end of the lower ladder-length, so that the slots S^2 in the ends thereof pass around the projected ends of the round or rung R^2 , with the ends of the upper ladder-length thereat held between the collar C^2 and the sides of the lower ladder-length, where the cotter-pin p^5 is passed through the eye e of the plate P below where the slots embrace the ferrule, and the upper end of the lower ladder-length is passed between the lower ends of the upper length, with the slots in the end of the lower length embracing the round R^2 of the lower length between the sides of the latter and the collar C^2 on ferrule F^2 on the round R^2 .

Where the slotted ends of ladders have by their lapping sides been made to grasp the upper round of the one and the lower round of the other, and a cotter-pin was inserted in a hole bored in the ends of the sides of each outside of the slots, the connection was not desirable from the fact that slotting the ends weakens the hold of the sides upon each other and renders them liable to split under strain, and the making of a hole in the sides below the slot to receive the cotter-pin still further weakened the wood thereat.

By my improvement in using the plates P the slotted end of the ladder is prevented from splitting when under strain and is materially strengthened, and I dispense with the hole made in the wood to secure the cotter-pin.

The letters B designate braces. These braces connect with the rung or round at b' and with the ladder-sides at b^2 , and the function of these braces is to prevent the ladder from becoming shaky by a loosening of the connection between the rounds and sides.

The letters D designate rollers mounted on a shaft, d' , the latter being of such size that it may be inserted within the slots made in the ends of the upper length and be secured therein by plates P at the sides, and the function of these rollers and shaft is that when a ladder is being raised the upper end of the latter can be moved up on the rollers, the latter and their shaft turning in the slots at the ends of the ladder-sides to facilitate the operation.

While I prefer to make the rounds $R^2 R^3$ of the ladders with metallic ferrules to give durability to them, yet the plate P may be used in connection with the rounds R^2 and R^3 , made without said ferrules.

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

1. The combination, with two ladder-lengths, each having slots in the ends of their sides adapted to receive, when lapped thereat, one of the rounds of the other ladder-length, of the plate P, made to receive a cotter-pin and constructed to attach to each of the ladder-lengths, substantially in the manner as and for the purposes set forth.

2. The combination of the ladder-length U, made with the side slots, $S^2 S^2$, in its lower end, and the round R^3 , having the ferrule F' , the ladder-length O, made with the round R^2 , having the ferrule F^2 , and side slots, $S' S'$, in its upper end, and the plates P, made with cotter-pins p^5 , and adapted to attach to the ladder-lengths and be operated substantially as shown and described.

3. The combination of the ladder-length U, made with the slot S^2 in each of its sides at the upper end, and the roller D, having a shaft, d' , adapted to turn in said slots, and the plate P, provided with a cotter-pin and adapted to attach to the ladder-sides, as shown and described.

Signed at Troy, New York, this 3d day of July, 1886, and in the presence of the two witnesses whose names are hereto written.

JNO. S. TILLEY.

Witnesses:

CHARLES S. BRINTNALL,
W. E. HAGAN.