

No. 708,040.

S. R. HENRY.  
FIRE LADDER.

Patented Sept. 2, 1902.

(No Model.)

(Application filed Oct. 25, 1901.)

2 Sheets—Sheet 1.

Fig. 5.

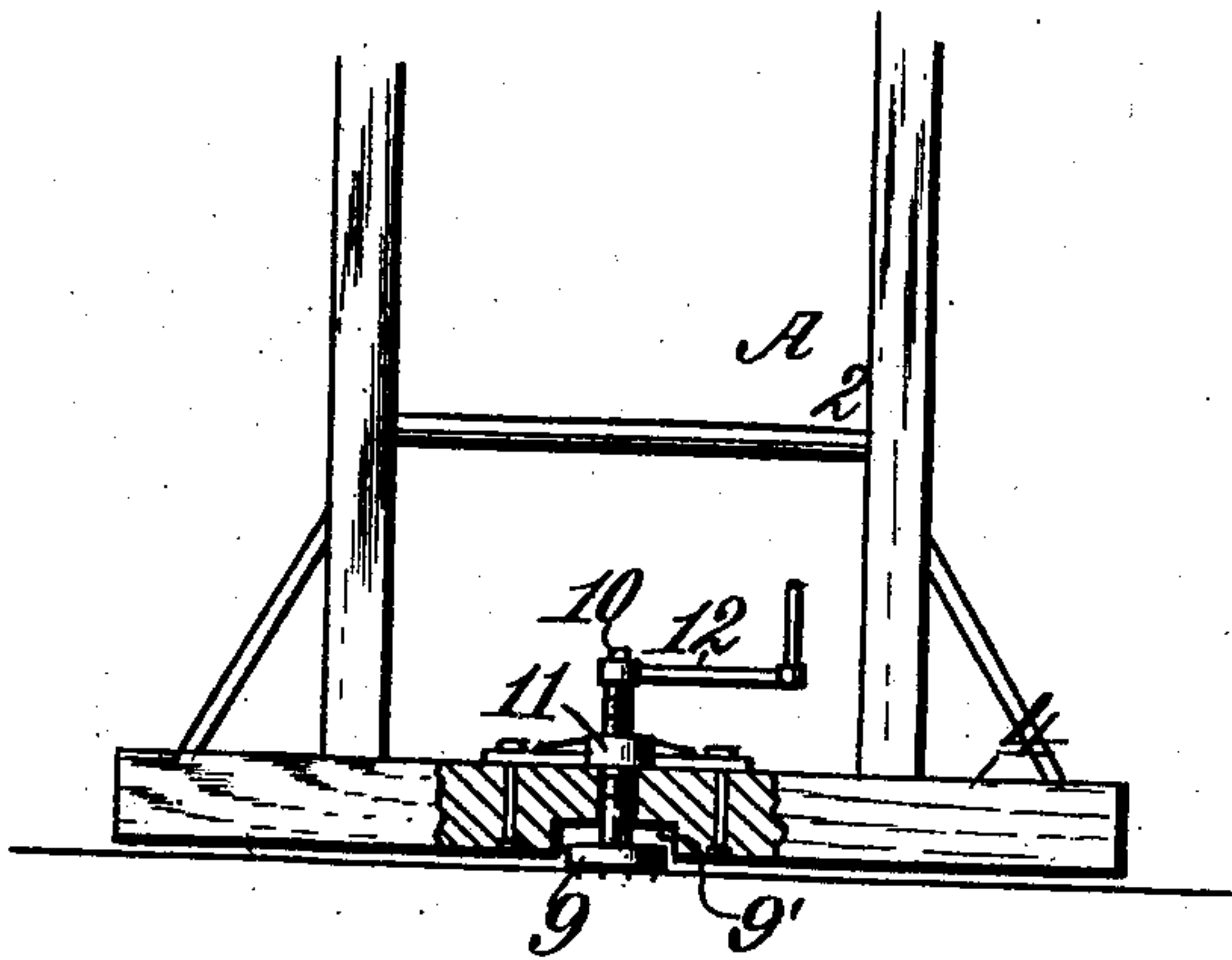


Fig. 6.

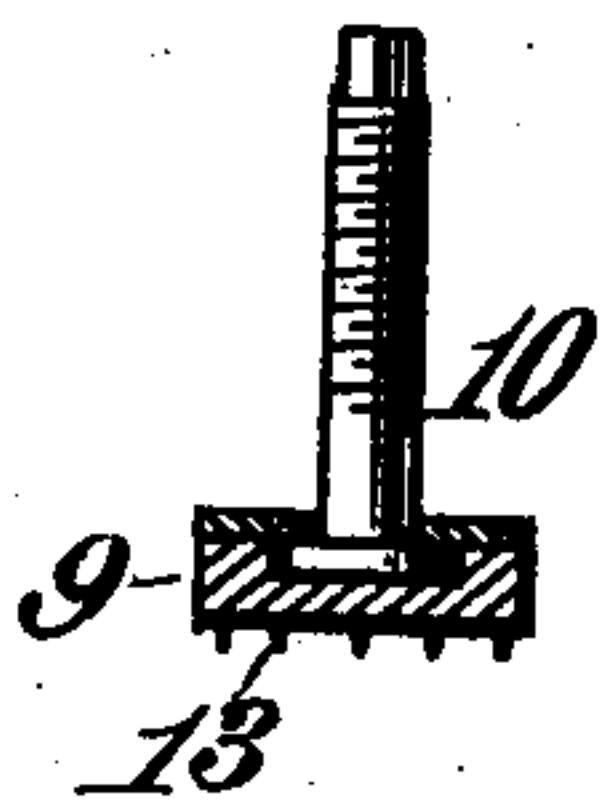


Fig. 7.

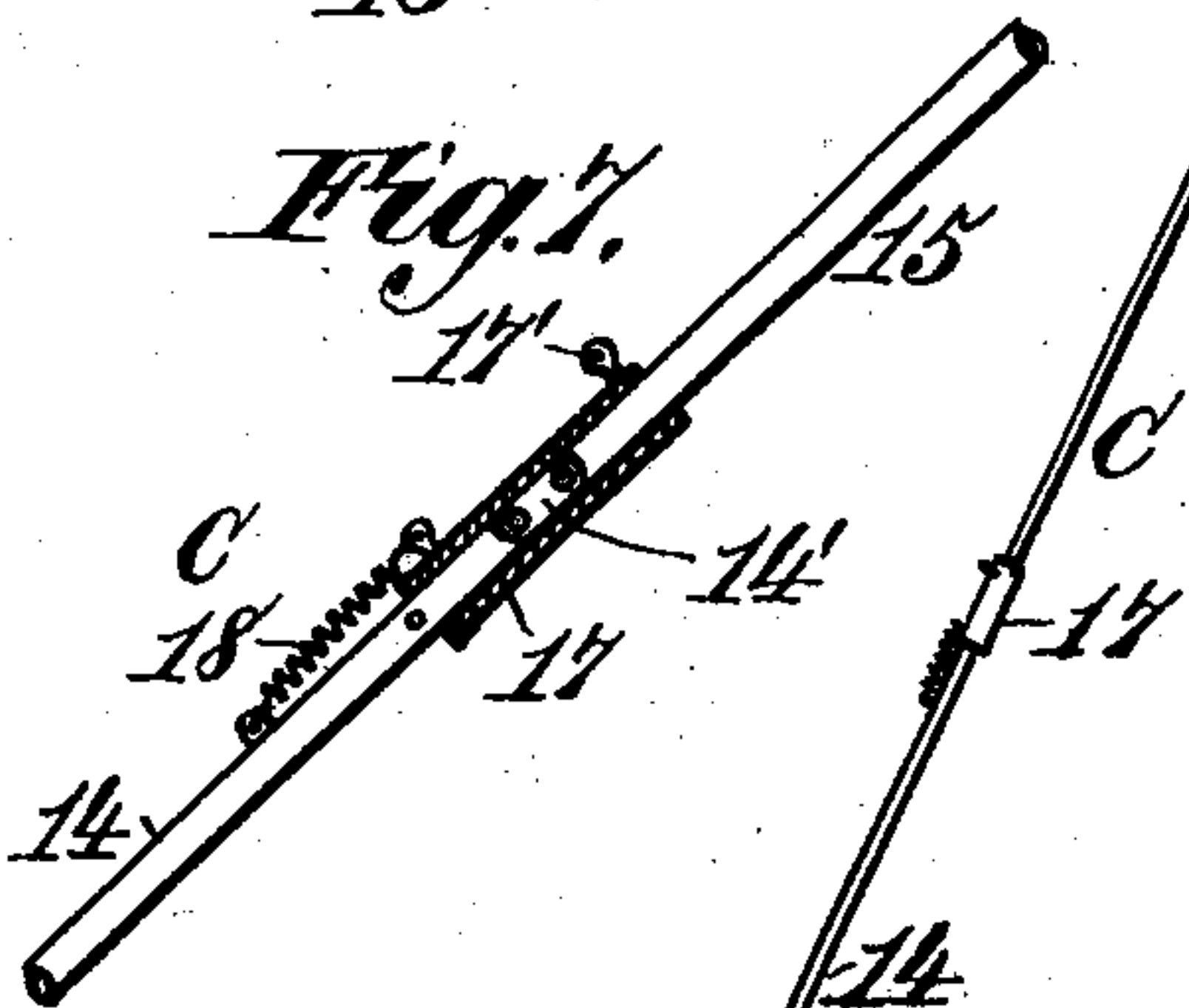


Fig. 1.

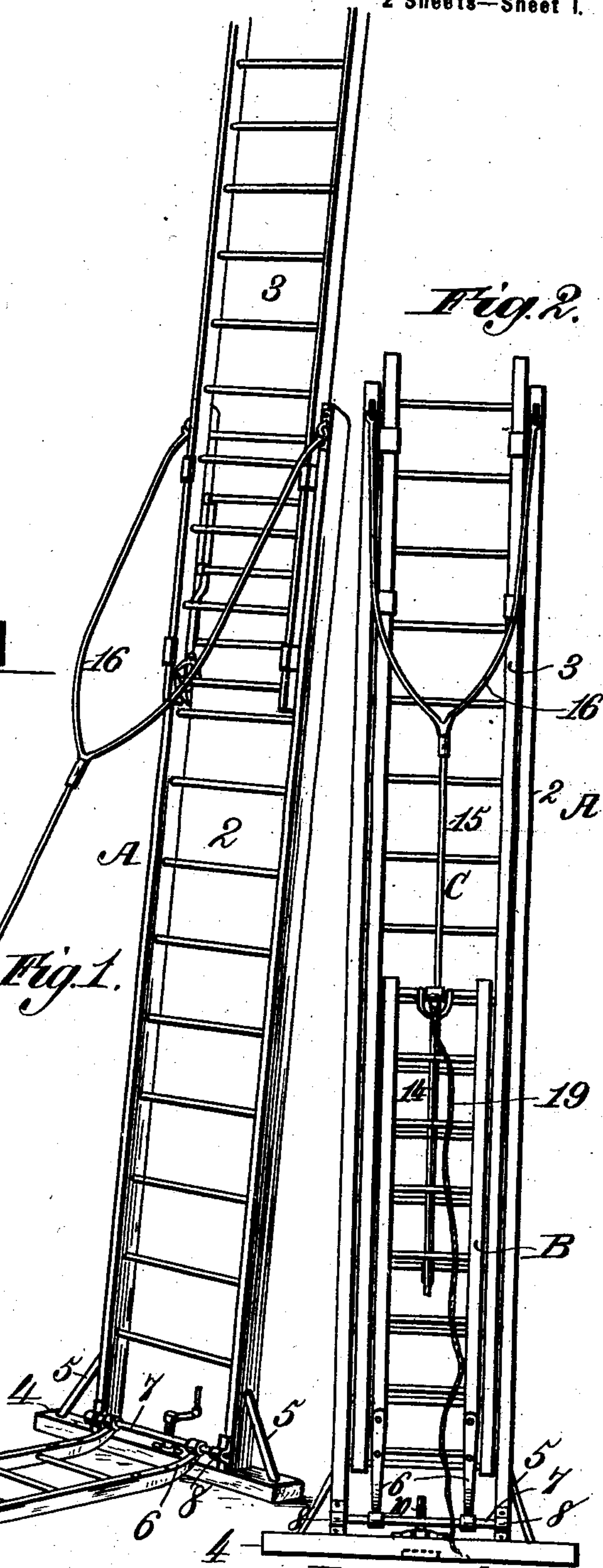


Fig. 2.

Witnesses.  
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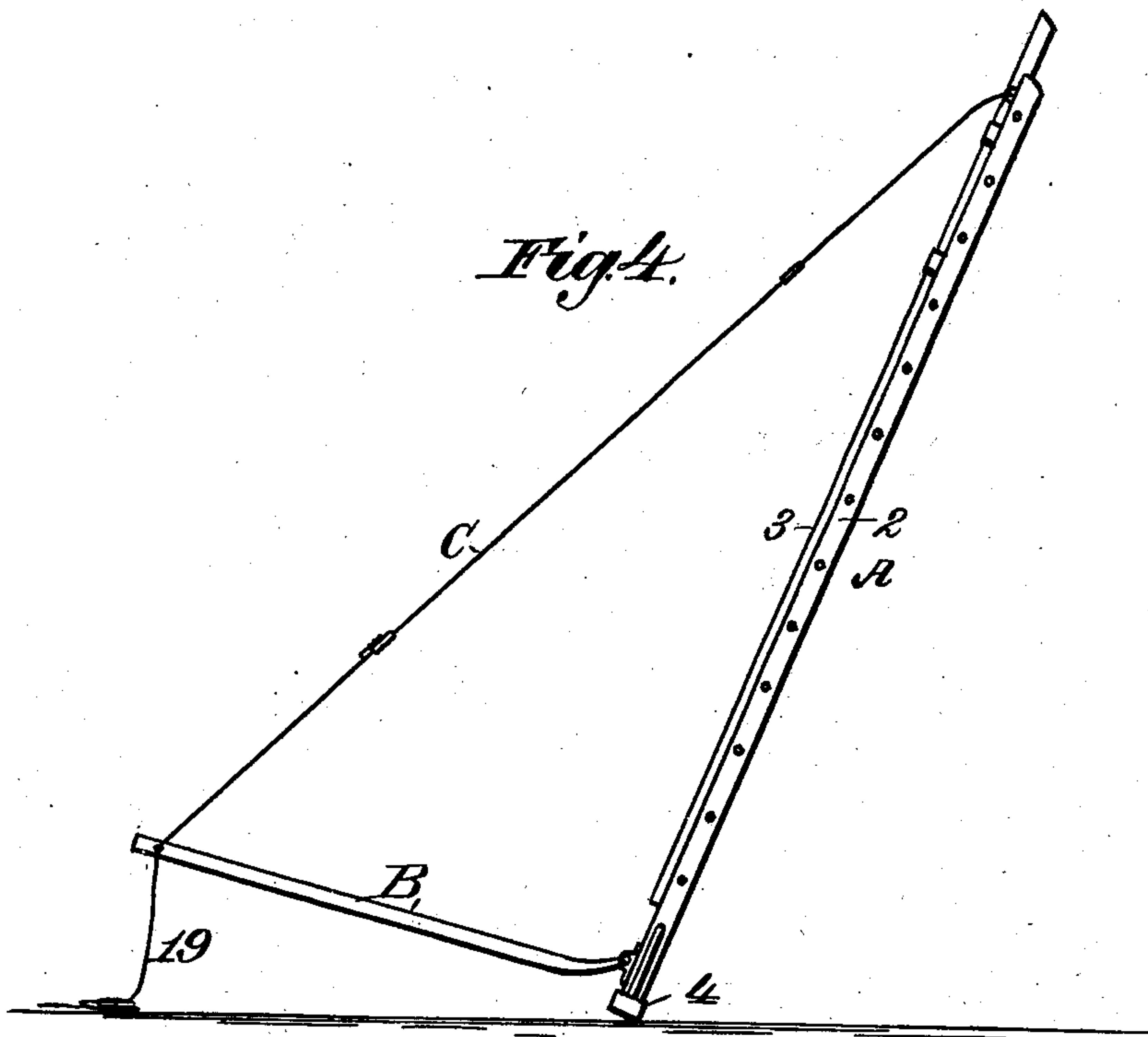
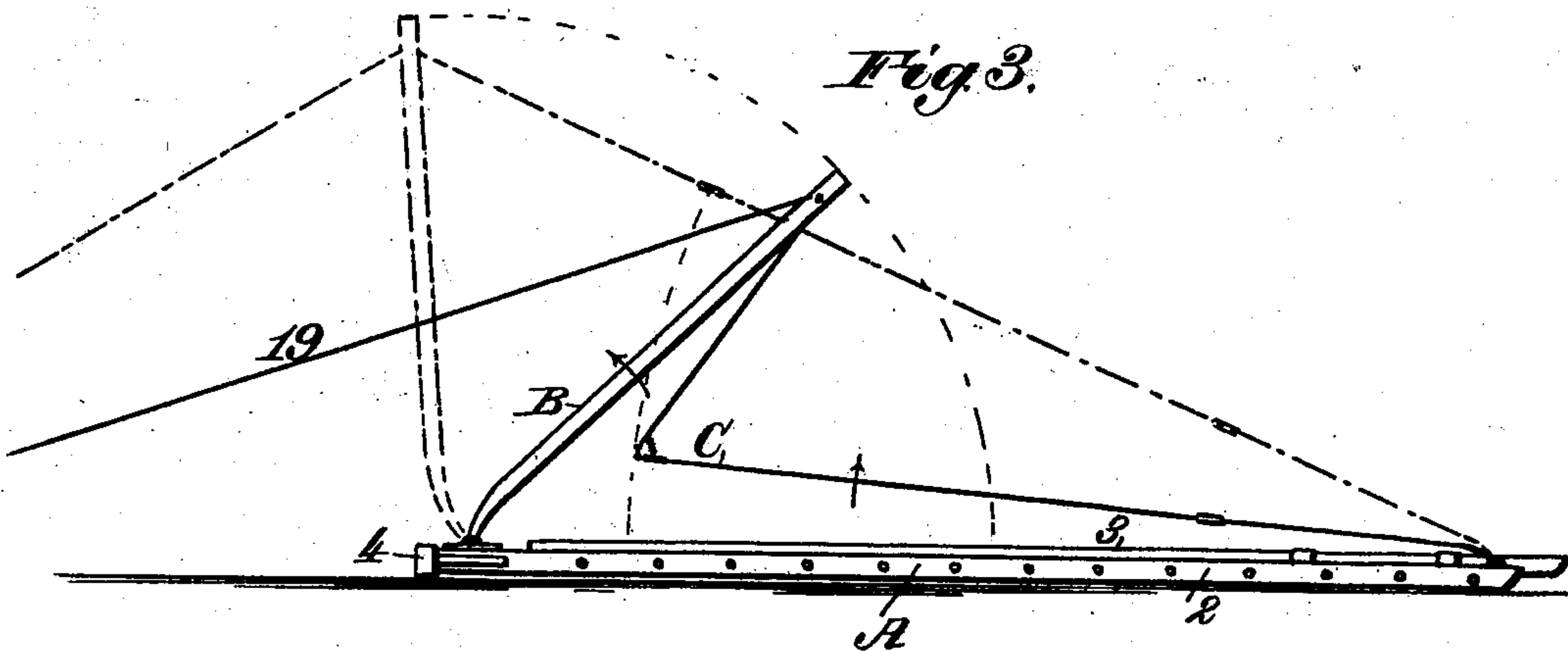
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Witnesses.  
*Robert G. Pratt*  
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Inventor,  
Samuel R. Henry.  
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# UNITED STATES PATENT OFFICE.

SAMUEL R. HENRY, OF WASHINGTON, DISTRICT OF COLUMBIA.

## FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 708,040, dated September 2, 1902.

Application filed October 25, 1901. Serial No. 79,976. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL R. HENRY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Fire-Ladders, of which the following is a specification.

This invention relates to ladders; and it is especially intended for use in fire-departments, although I do not wish to so limit the invention, and as constructed it may be mounted upon a fire-truck or like apparatus, it being comparatively light, yet thoroughly strong. Said ladder is of the extensible foldable kind, it occupying when collapsed but a relatively small amount of space, and it can be opened out for use very readily and quickly and can be raised with small effort to a perpendicular position or placed against a building, so that the firemen can thereby reach the upper stories of such building.

The invention includes as one of its features a base-piece adapted to stand upon the ground and a ladder rotatively supported by said base-piece, and these devices may be of any suitable character. The pivot in the present case consists of a screw passing through the sill of the ladder and swiveled to the base-piece, said screw passing through a fixed nut on the sill and having a hand-crank, by turning which the sill may be raised off the ground a distance sufficient to permit the free rotation of the ladder.

The invention also includes means for preventing the ladder from falling outward or away from a building, this being a common accident with certain existing forms of ladders.

The invention includes other objects and advantages, which, with the foregoing, will be set forth at length in the following specification, while the novelty thereof will form the basis of the claims appended thereto.

In the drawings accompanying and forming a part of this specification, Figure 1 is a perspective view of a ladder including my improvements and showing the same as erected. Fig. 2 is a front elevation of the ladder folded. Fig. 3 is a side elevation of the ladder, showing the lever-ladder connected thereto in a vertical position, so that force can be applied to said lever-ladder to raise

the main or scaling ladder to a perpendicular position. Fig. 4 shows the ladder in its upright position. Fig. 5 is a detail in sectional elevation of the sill, pivot, and base-piece, together with coacting parts. Fig. 6 is a similar view of the base-piece and pivot-screw. Fig. 7 is a detail in sectional elevation of a part of a stay device.

Like characters refer to like parts in all the figures.

The ladder illustrated is denoted in a general way by A, and it is of the extensible type, and it may be of any suitable length and may consist of as many sections as desired.

The extensible feature of the ladder A forms no part of the present invention, and hence I deem it unnecessary to show the same in detail further than to state that there are two parts 2 and 3, the upper part 3 being slidable upon the lower or relatively stationary part 2.

The lower part of the ladder A has a sill, as 4, suitably fastened thereto, the structure being strengthened by the diagonal braces 5, suitably connected to the respective parts.

The ladder A is in the nature of a main ladder, for I connect therewith an auxiliary ladder B, the parts being pivotally united, so that the auxiliary ladder B can be folded upon its mate or opened out, as will hereinafter appear, to facilitate the erection of the main or scaling ladder A.

To the inner ends of the side bars of the auxiliary ladder B, I fix metallic strips, as 6, having eyes or sleeves at their inner ends to receive the pivot 7, the eyes being connected to the pivot in some suitable manner and the ladder in turn having its opposite ends journaled in brackets, as 8, carried at or near the lower ends of the side bars of the ladder A.

Beneath the sill 4 is a base-piece, which may consist of a disk 9 and which is adapted to rest upon the ground or like support in proximity to a building. The ladder A is pivoted to this base-piece, so that it may be turned after having been raised, whereby its upper end can be placed against a building, and the pivot is denoted by 10, and it is shown as consisting of a screw passing centrally through the sill 4 and also through a fixed nut 11, suitably secured to the upper side of the sill 4. The lower end of the screw or



pivot 10 is swiveled to the base-piece, so that the former may be freely rotated without effecting the latter, and the upper end of said screw is provided with a hand-crank, as 12, by which said screw may be more easily rotated. The underside of the base-piece or disk 9 is roughened, so that it can more readily take hold of the ground and to prevent its rotation as the hand-crank 12 is manipulated, and this roughened surface can be secured in any convenient manner. For this purpose I have shown the disk as equipped with a multiplicity of pins 13, which may be pointed.

When upon a truck or similar fire apparatus, the upper section 3 of the ladder will be lying against the lower part 2 and the auxiliary ladder B will be folded upon the ladder A, as shown in Fig. 2. The device will, when it is desired to use the same, be taken from the truck and laid upon the ground in parallelism with a building, after which the ladder B will be swung up to a position at right angles to the ladder A, in which position it is held by a suitable stay device. The stay device may be of any suitable kind, that shown being designated in a general way by C and consisting of the rods 14 and 15, connected by a short link 14', and the bail 16, the branches of which are pivoted or likewise jointed to the side bars of the lower portion 2 of the ladder A, and the bail is rigidly connected to the upper end of the upper rod 15, while the lower rod 14 is suitably connected to the ladder B—for example, by being pivoted to the outer rung thereof. When the ladder B is raised to a position at right angles to the ladder A, the rods 14 and 15, link 14', connecting the same, and bail 16 are brought into alinement and are disposed at an inclination to the ladder A, and as means of a suitable nature are provided to prevent the flexure of the joint between the rods 14 and 15 said rods and bail form an absolutely rigid brace or stay device for the ladder A, whereby said ladder cannot fall outwardly or away from the building against which it is placed, while said brace or stay device can be folded up to occupy the space between the ladders A and B, when the device as a whole is collapsed. The bail 16 is advantageous in that while it forms an effective part of the brace or stay device it does not prevent the free ascent and descent of the men along the ladder A. The link-joint between the rods 14 and 15 is held against flexure by any suitable means—for example, by the spring-actuated sleeve 17, the operating-spring of which is denoted by 18, said spring being of the coiled-and-pull type and being suitably connected, respectively, with said sleeve and rod 14. With the stay device C folded between the ladders A and B the rod 14 will be lying against the rod 15, while the sleeve 17 will be wholly on the rod 15. As the ladder B is raised as described the rod

14 will be moved therewith, so as to pull on the spring, whereby when the rods 14 and 15 are in line the sleeve 17 will be instantly shot across the link-joint, so as to positively prevent its being broken accidentally. The sleeve 17 has a finger-piece, as 17', by which it may be slid free of the link-joint when it is desired to take down the ladder. Of course when the sleeve is off the joint the stay device C can be folded so that the ladder B can be placed against the ladder A, said stay device being then situated between said parts.

It will be assumed that the ladder A is upon the ground, as aforesaid, and that the ladder B is held at right angles thereto. It is therefore necessary to raise the ladder A from the ground. During this action I utilize the ladder B as a lever-ladder, the rope, cord, or like connection 19 being suitably connected to said ladder B near its outer end—for example, by being fastened to a rung thereof. Therefore with the ladder A occupying a horizontal position the ladder B will be perpendicular thereto, and by one or more men pulling upon the rope or cord 19 a high leverage can be applied to the ladder A, so as to raise the ladder to an upright position. This will bring the sill 4 upon the ground, and some of the pins 13 of the base-piece 9 will penetrate the support, whatever it may be. Normally the base-piece 9 fits within or occupies a seat or recess 9' in the sill 4. As the sill rests upon the ground, it would be an exceedingly laborious matter to turn the same so as to bring the ladder A in proper position against the building. To overcome this, however, the hand-crank 12 is turned to an extent sufficient to raise the sill 4 wholly out of contact with the ground. The ladder A can then by grasping the ladder B be swung around upon the pivot-screw 10 to any degree and when properly positioned may be placed against the building. The upper part 3 of the ladder A can be extended at any desirable point in the erection of said ladder. The collapsing of the ladder is clearly evident, and therefore no description need be made of the same, as it is simply a reversal of the steps followed in opening said ladder.

The invention of course is in no wise limited to the construction previously set forth, for many changes within the scope of the appended claims may be made.

Having described the invention, what I claim is—

1. The combination of a ladder having a sill, a nut carried by the sill and located between the side bars of said ladder, and a screw passing through the nut and the nut being fixed relatively to the screw against movement in the direction of the length of said screw.

2. The combination of a ladder having a sill, a nut carried by the sill substantially centrally thereof, a screw passing through said nut and said nut being held against movement relatively to the screw in the direction



of the length of said screw, and a base-piece adapted to rest upon the ground, and connected to said screw.

3. The combination of a ladder having a  
5 sill, a nut carried by the sill substantially centrally thereof, a screw passing through the nut and the latter being held against movement relatively to the screw, in the direction of the  
length of said screw, and a base-piece swiv-  
10 eled to the screw.

4. The combination of a ladder having a  
sill provided with a seat on its under side and  
having a fixed nut, a screw passing through  
said nut, a base-piece swiveled to the lower  
15 end of the screw and arranged to fit in said

seat, and means carried by the screw for rotating the same.

5. The combination of a ladder having a  
sill provided with a seat on its under side and  
having a fixed nut, a screw passing through 20  
said nut, and a base-piece connected to the  
screw and arranged to fit completely in said  
seat.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit- 25  
nesses.

SAMUEL R. HENRY.

Witnesses:

GEO. W. REA,

HEATH SUTHERLAND.