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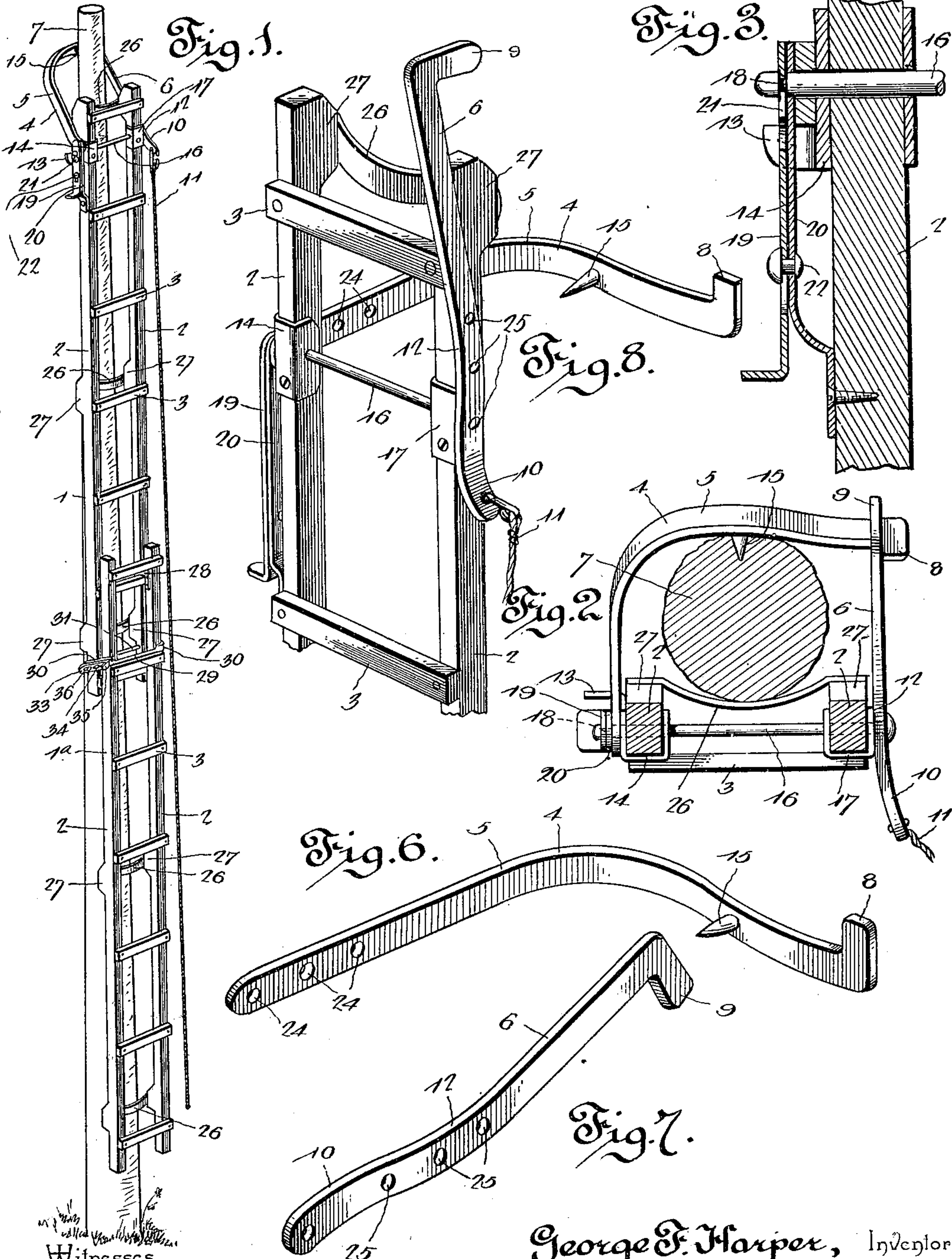
G. F. HARPER.

ADJUSTABLE LADDER FOR TELEPHONE POLES, &c.

(Application filed Nov. 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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By his Attorneys,  
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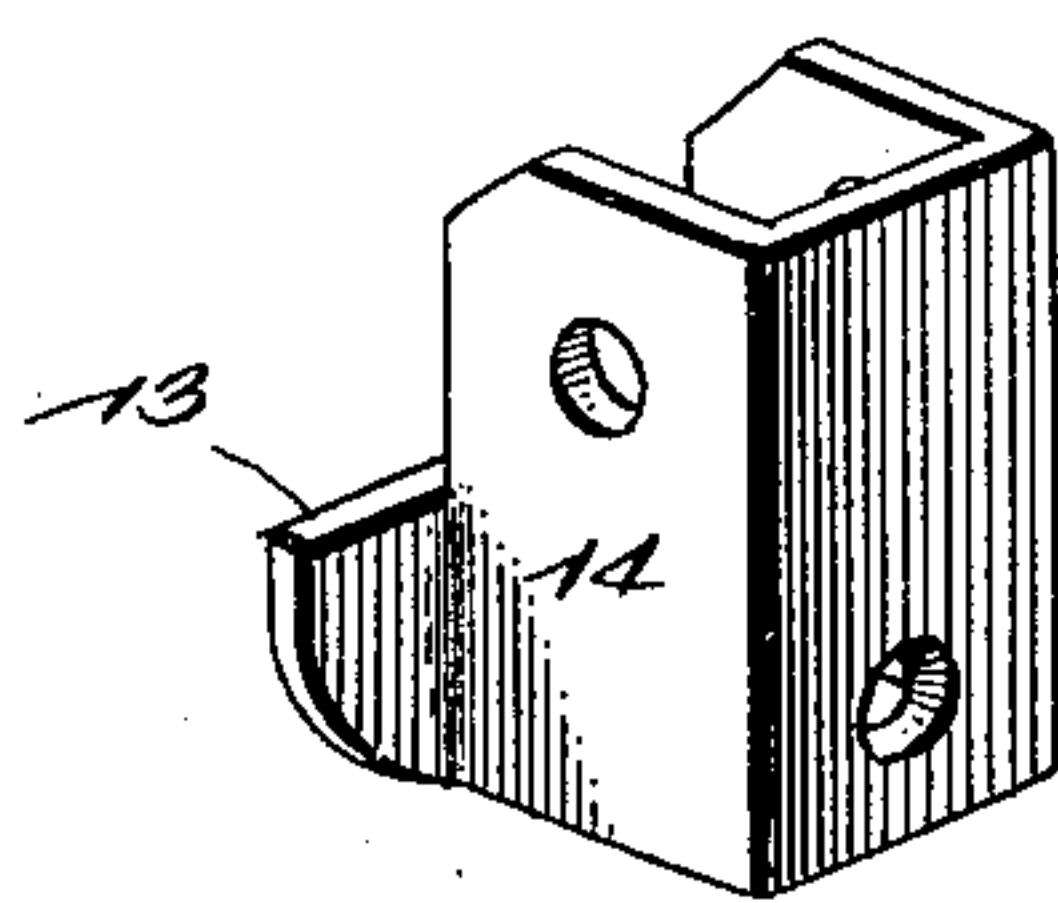
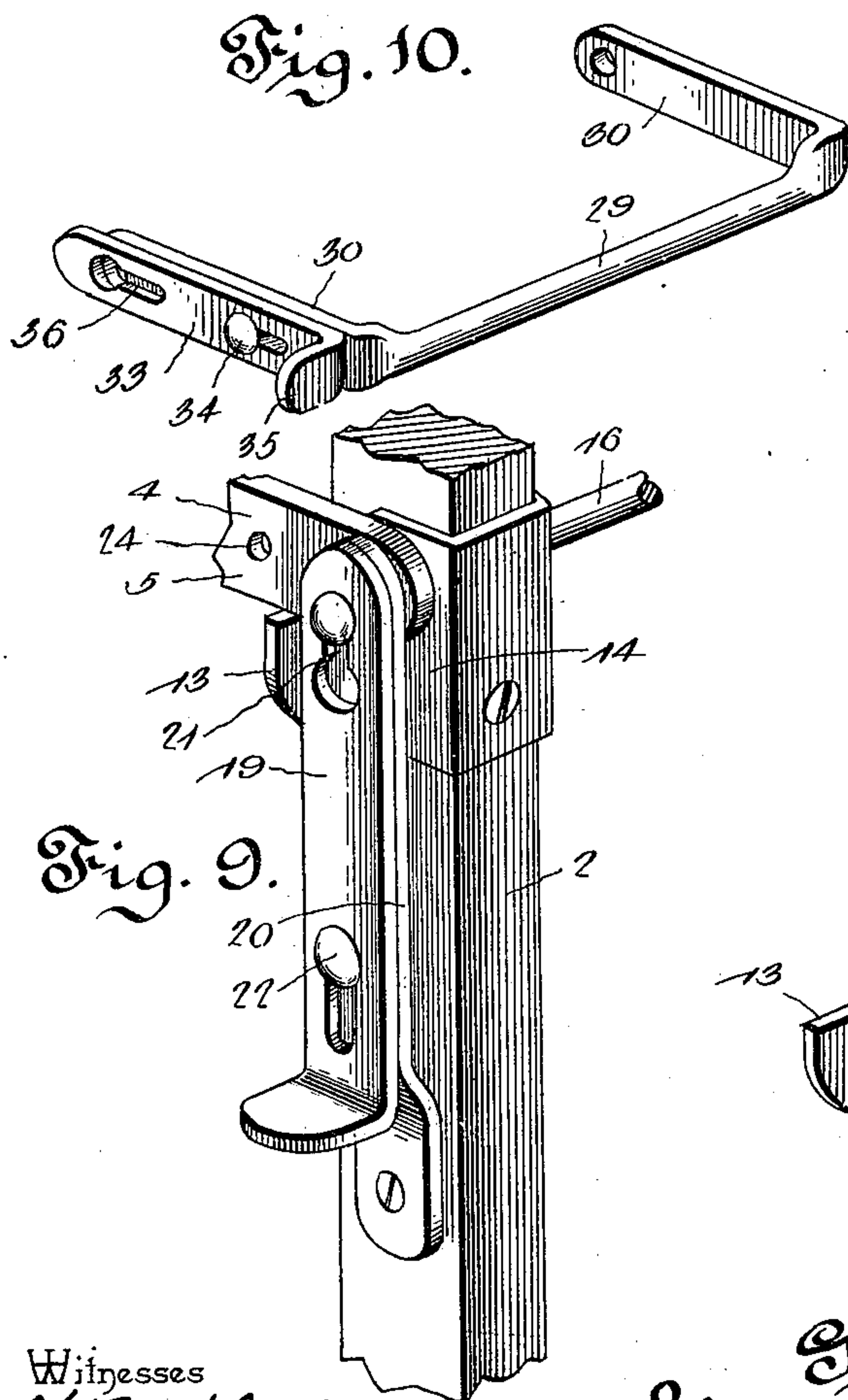
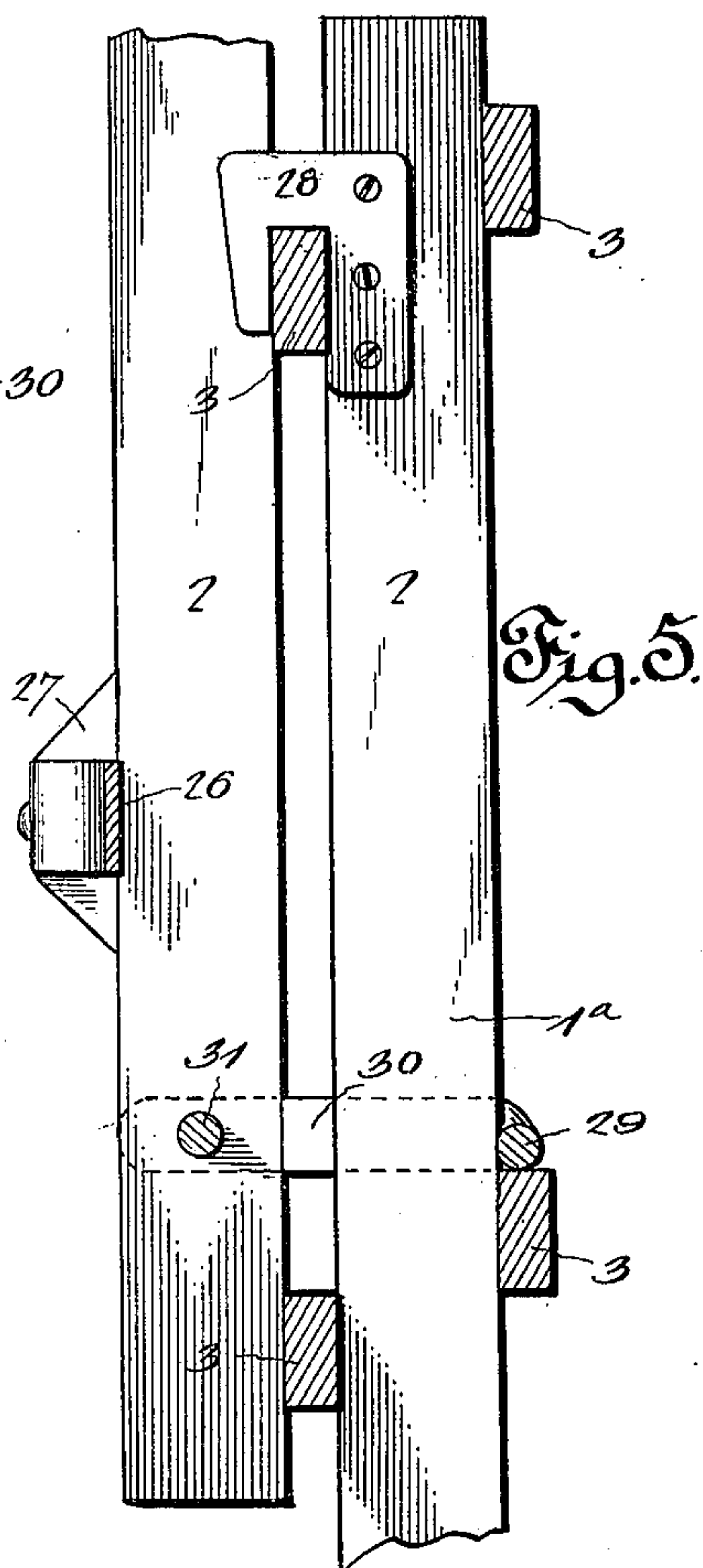
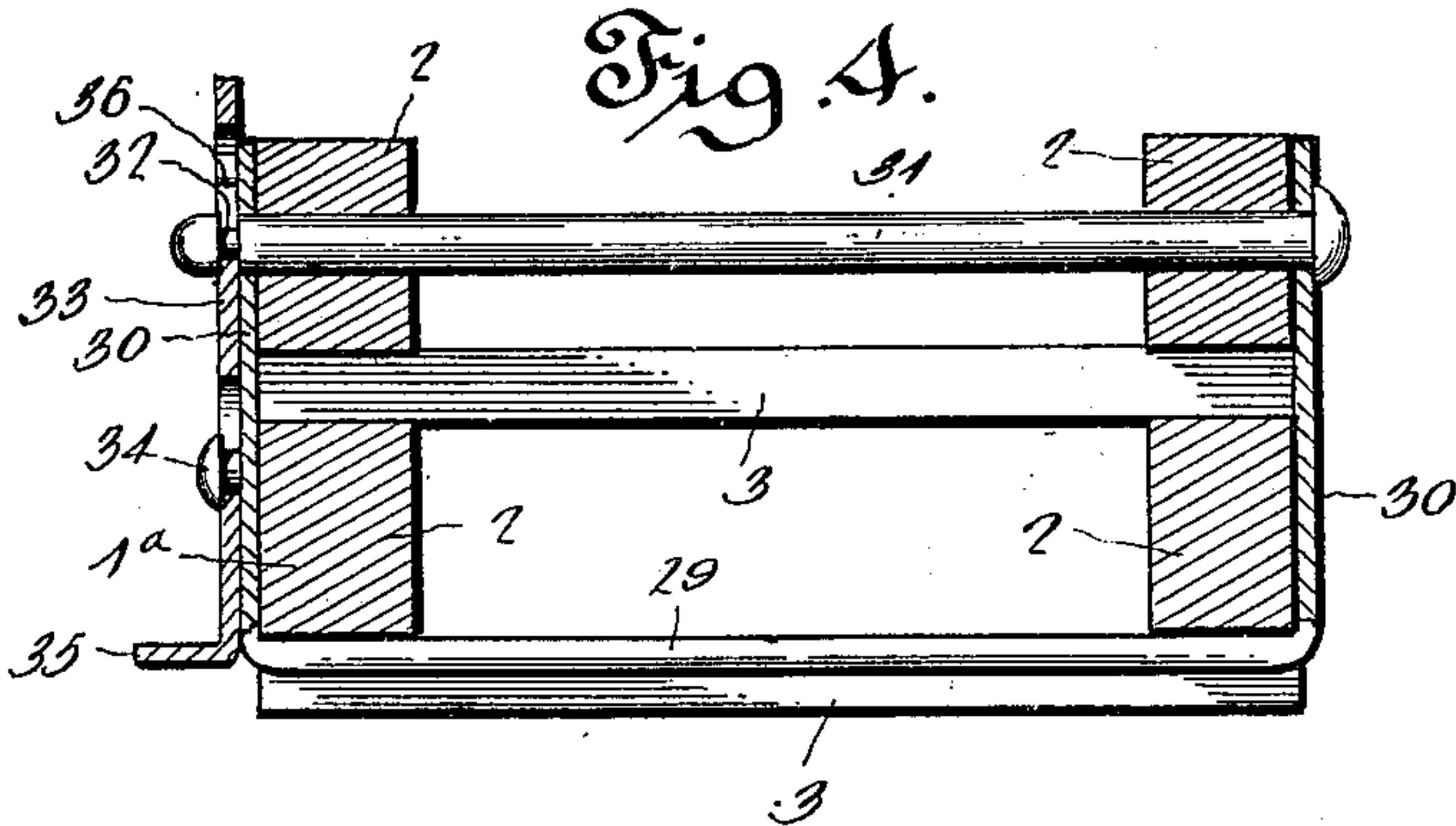
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# UNITED STATES PATENT OFFICE.

GEORGE F. HARPER, OF LENOIR, NORTH CAROLINA.

## ADJUSTABLE LADDER FOR TELEPHONE-POLES, &c.

SPECIFICATION forming part of Letters Patent No. 631,302, dated August 22, 1899.

Application filed November 21, 1898. Serial No. 697,039. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. HARPER, a citizen of the United States, residing at Lenoir, in the county of Caldwell and State of North Carolina, have invented a new and useful Adjustable Ladder for Telephone-Poles, &c., of which the following is a specification.

The invention relates to improvements in adjustable ladders for telephone-poles and the like.

The object of the present invention is to improve the construction of adjustable ladders and to provide a simple, inexpensive, and efficient one designed for use in repairing telephone and other electric wires and adapted to be quickly applied to a pole and capable of being constructed sufficiently light to enable it to be conveniently carried.

A further object of the invention is to provide an overhead support for ladders adapted to clamp firmly wooden and other poles and capable of suspending a ladder above the ground so that it will be subjected to tensile strain only.

Another object of the invention is to enable a ladder to be constructed of adjustable sections and to connect the same in such manner that the ladder may be readily and quickly adjusted to the proper length, so that it may be suspended from poles of different heights.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a ladder constructed in accordance with this invention and shown applied to a pole. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a detail sectional view of the upper portion of the ladder, illustrating the manner of detachably mounting the clamping device thereon. Fig. 4 is a transverse sectional view of the lower portion of the ladder, illustrating the manner of clamping the sections together. Fig. 5 is a longitudinal sectional view of the same. Fig. 6 is a detail perspective view of the clamping-bar. Fig. 7 is a similar view of the latch-lever. Fig. 8 is an enlarged perspective view of the

upper portion of the ladder, the parts being arranged for introducing it on a pole. Fig. 9 is a detail view of the upper locking-plate. Fig. 10 is a detail view of the yoke. Fig. 11 is a detail view of one of the reinforcing-plates.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a ladder composed of side bars 2 and horizontal rungs or cross-pieces 3, and the said ladder, which is designed for use on telegraph-poles and the like, is suspended above the ground by an overhead support or clamp 4 in order that it may be subjected to tensile strain only, so that it may be constructed sufficiently light to be portable and easily carried long distances without fatigue. For operating on telephone and telegraph poles twenty-five feet long a fourteen-foot ladder will be found sufficient, and its sides can be constructed of timber an inch by an inch and one-half, and the rungs or steps, which will be eight inches in length, may be constructed of timber an inch and one-half by seven-eighths of an inch. A ladder of this size and weight may be conveniently carried, and it can be arranged three feet above the ground, and an operator standing upon the uppermost step can work at least five feet above the top of the ladder.

The overhead support or clamping device 4 is composed of a substantially L-shaped clamping-bar 5 and a latch-lever 6. The clamping-bar has one end pivoted to one side of the ladder, near the top thereof, as clearly illustrated in Fig. 1 of the accompanying drawings, and it extends around the back of the pole 7 to the opposite side thereof, and its outer end is provided with an upwardly-extending lug 8, which is engaged by the latch-lever 6. The latch-lever is fulcrumed between its ends on the ladder, near the top thereof, and its rear or engaging end is provided with a depending lug or arm 9. The front end 10 of the lever is bent outward to clear the ladder and is connected with an operating cord or rope 11 by a link or eye. The operating cord or rope is adapted to lift the lever out of engagement with the clamping-bar, and the said latch-lever is provided be-



tween its ends with a bend 12, adapted when its lower arm is vertical to throw the engaging lug or arm 9 forward clear of the pole, so that the ladder may be readily removed therefrom or placed thereon. The clamping-bar is supported in a horizontal position preparatory to applying the ladder to a pole by a lug 13 of a plate 14, and after the latch-lever is engaged with the clamping-lever to retain the ladder on the pole the said ladder is drawn downward, causing the clamp or overhead support to swing upward and bind against the pole, and the weight of a person upon the ladder increases the clamping action, so that there is no liability of the ladder slipping when in use. The clamping-lever is provided at its back with a spur 15, adapted to embed itself in a wooden pole to prevent the clamp or overhead support from slipping; but when the device is employed in connection with metal poles the spur is unnecessary, as the clamping action on such a pole will prevent any liability of the ladder slipping downward.

The clamp or overhead support is hinged to the ladder by a horizontal rod 16, passing through perforations of the sides 2, which are supported by the plate 14 and by a similar plate 17, arranged on the front of the ladder and provided with sides or flanges which extend over the side faces of the ladder a sufficient distance to cover the perforations, and these sides or flanges have corresponding apertures to receive the pintle-rod. One end of the pintle-rod is provided with a head and the other end has an annular groove 18, which is engaged by a sliding locking-plate 19, which is mounted on a bracket 20, secured to the ladder and spaced therefrom at its upper portion. The clamping-lever is arranged between the bracket and the ladder and the sliding locking-plate 19 is provided with a keyhole-slot 21, adapted to have its larger portion register with a perforation of the bracket and capable of being drawn downward to carry its narrower portion into engagement with the annular groove. The lower end of the plate 19 is provided with a lip to enable it to be readily grasped, and the lower portion of the said plate 19 is slidably connected with the bracket by means of a slot-and-pin connection 22; but any other suitable device may be employed for this purpose. The clamping lever or bar and the latch-lever are provided with perforations 24 and 25, adapted to receive the pintle-rod and capable of enabling the opening of the clamp or overhead support to be varied in size to accommodate poles of different diameters. The clamp or support is adapted for operating on poles of different shapes in cross-section. It can be applied to other timbers and the latter will hang in a vertical position even though the pole should be out of plumb.

The ladder is spaced from a pole to enable a person to obtain a safe and easy foothold on the steps by means of horizontal bars 26,

curved to conform to the configuration of a pole and having their ends secured to blocks 27 to offset them sufficiently from the rear faces of the sides of the ladder. These horizontal curved bars form a seat for the pole and enable the ladder to fit snugly against the same, and they also resist any tendency of the ladder to swing.

In order to render the ladder adjustable to suit poles of different heights and also to facilitate transporting it in a wagon, car, or other vehicle, it may be composed of two sections, the lower section 1<sup>a</sup> being adjustable and provided at its top with hooks 28, adapted to engage any one of the steps 3 of the main or upper section, and by overlapping the sections to a greater or less extent a ladder of the proper length is obtained. The lower section 1<sup>a</sup> of the ladder is locked against upward movement to prevent the hooks from becoming disengaged from a step of the upper section when the ladder is lifted by a yoke 29, composed of a transverse front portion and side portions 30, which are arranged on the outer faces of the sides of the sections, as clearly shown in Fig. 4 of the accompanying drawings. The sides 30 of the yoke are perforated to receive a transverse rod 31, and the transverse front portion of the yoke is preferably rounded and engages the upper edge of one of the steps of the lower section 1<sup>a</sup>, lying close to the same, so as not to interfere with the ascent of a person.

The rod 31 is removable to enable the yoke to be engaged with the proper step of the lower section, and it has a head at one end and an annular groove 32 at its other end to be engaged by a sliding plate 33. The sliding plate 33, which is mounted on one side of the yoke by a pin-and-slot connection 34, is provided at one end with a lip 35, and it has at its other end a keyhole-slot 36 for engaging the annular groove of the movable rod in the same manner as the locking-plate heretofore described.

The invention has the following advantages: The ladder, which is exceedingly simple and inexpensive in construction, is adapted to be readily applied to a pole or analogous object, and it is capable of being quickly adjusted to suit the diameter and length of the same. It is suspended above the ground so that it is subjected only to a tensile strain, whereby it may be constructed of light material to render it portable and easily carried without fatigue. The clamp or overhead support, which is strong and durable, is capable of engaging a round pole or square post, and it is adapted to be adjusted to either a vertical pole or an inclined one. It conforms to the configuration of a pole, and the horizontal bars form a seat for the same and space the steps therefrom, so as to form a safe and easy foothold for the operator.

Changes in the form, proportion, and minor details of construction may be resorted



to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

5 1. A ladder, in combination with a suspending device for attaching it to a pole, said device comprising a clamp pivoted to one side of the ladder and bent to partially embrace the pole, and a latch-lever pivoted intermediate its ends to the opposite side of the ladder and adapted to interlock with the free end of the clamp and to swing away from the clamp to provide an entrance for the pole, substantially as described.

15 2. A ladder designed to be suspended from a pole and a clamping device thereon extending transversely of the ladder and arranged to receive said pole within it, said clamping device being pivotally connected to the ladder and arranged to clamp the pole between it and the said ladder, substantially as described.

25 3. A ladder in combination with a swinging clamp adapted to embrace a pole and comprising an L-shaped clamping-bar pivoted to and extending from one side of the ladder and arranged to receive said pole, and a latch-lever pivoted to the opposite side of the ladder and extending from the same to the outer end of the clamping-bar, substantially as described.

30 4. The combination with a ladder of a swinging clamp composed of an L-shaped clamping-bar pivoted at one side of the ladder and provided at its outer end with an upwardly-extending lug, and a pivoted latch-lever mounted on the other side of the ladder and provided at its rear end with a depending arm or lug to engage the rear end of the clamping-bar, substantially as described.

40 5. The combination with a ladder, of a swinging clamp composed of a clamping-bar arranged at one side of the ladder, a lever fulcrumed between its ends on the other side of the ladder and arranged to engage the clamping-bar, and an operating cord or rope connected with one end of the lever and adapted to swing the same away from the clamping-bar, substantially as described.

50 6. The combination with a ladder, of a clamp comprising a clamping-bar mounted on one side of the ladder, a latch-lever pivoted between its ends at the other side of the ladder and provided at its engaging end with an arm or lug and having a bend between its ends, and an operating connection attached to the other end of the lever and adapted to swing the arm or lug forward out of the way, substantially as described.

60 7. A ladder, a clamp thereon comprising a clamping-bar pivoted at one side of the ladder, a stop arranged to support the clamping-bar in a horizontal position, a latch-lever mounted on the other side of the ladder and engaging the clamping-bar, and means for

swinging the lever upward from the clamping-bar, substantially as described.

8. A ladder, a swinging clamp thereon comprising a clamping-bar, a latch-lever, a removable rod passing through the lever and the bar and pivoting the same to the ladder and provided at one end with a groove, a bracket, and a sliding plate mounted on the bracket and provided with a keyhole-slot detachably engaging the groove of the bracket, substantially as described.

9. A suspension-ladder composed of a plurality of overlapping sections capable of adjustment upon each other, a suspending device at or near the top of the ladder adapted to engage a pole and suspend the ladder as an entirety, a supporting-hook mounted near the upper end of each one of the sections, except the upper one and adapted to engage a rung of the next higher section for sustaining the weight of its own section, and means for retaining the hook in engagement with said rung.

10. In a device of the class described, the combination of a ladder composed of two sections and designed to be suspended, a hook mounted on one of the sections and engaging a rung of the other section, whereby the lower section is supported, and a transverse yoke engaging the rung of the section having the said hook and mounted on the other section, whereby the hook is retained in its engagement, substantially as described.

11. The combination with a ladder for use on poles, and means for suspending the same at its upper end upon a pole, of a plurality of horizontally-disposed bars connecting the side pieces of the ladder and having concaved bearing-faces adapted to bear against the surface of the pole, and hold the ladder away from the pole and also prevent it from moving laterally thereon, substantially as described.

12. The combination with a suspension-ladder for use on poles, and means at its upper end for suspending it from a pole, of supports or blocks projecting from the rear faces of its side bars, and horizontally-disposed bars connecting said blocks and curved between the same to form concaved seats for a pole, whereby the ladder is held away from the pole and prevented from moving laterally thereon, substantially as described.

13. A ladder comprising upper and lower sections, a hook on the lower section for engaging the upper section, a yoke engaging one of the steps of the lower section to retain the hook in engagement with the upper section, a rod detachably securing the yoke to the upper section, and a locking-plate mounted on the yoke and engaging the rod, substantially as described.

14. In a suspension-ladder of the class described, the combination with the ladder and a suspending device therefor having a perfor-

ration, of a detachable rod passing through  
the perforation and ladder, and provided with  
a groove, and a slidable plate having a key-  
hole-slot which registers with the perforation,  
5 and is adapted to lock the rod in the perfora-  
tion of the suspending device, substantially  
as described.

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

GEORGE F. HARPER.

Witnesses:

JOHN H. SIGGERS,  
HAROLD H. SIMMS.