

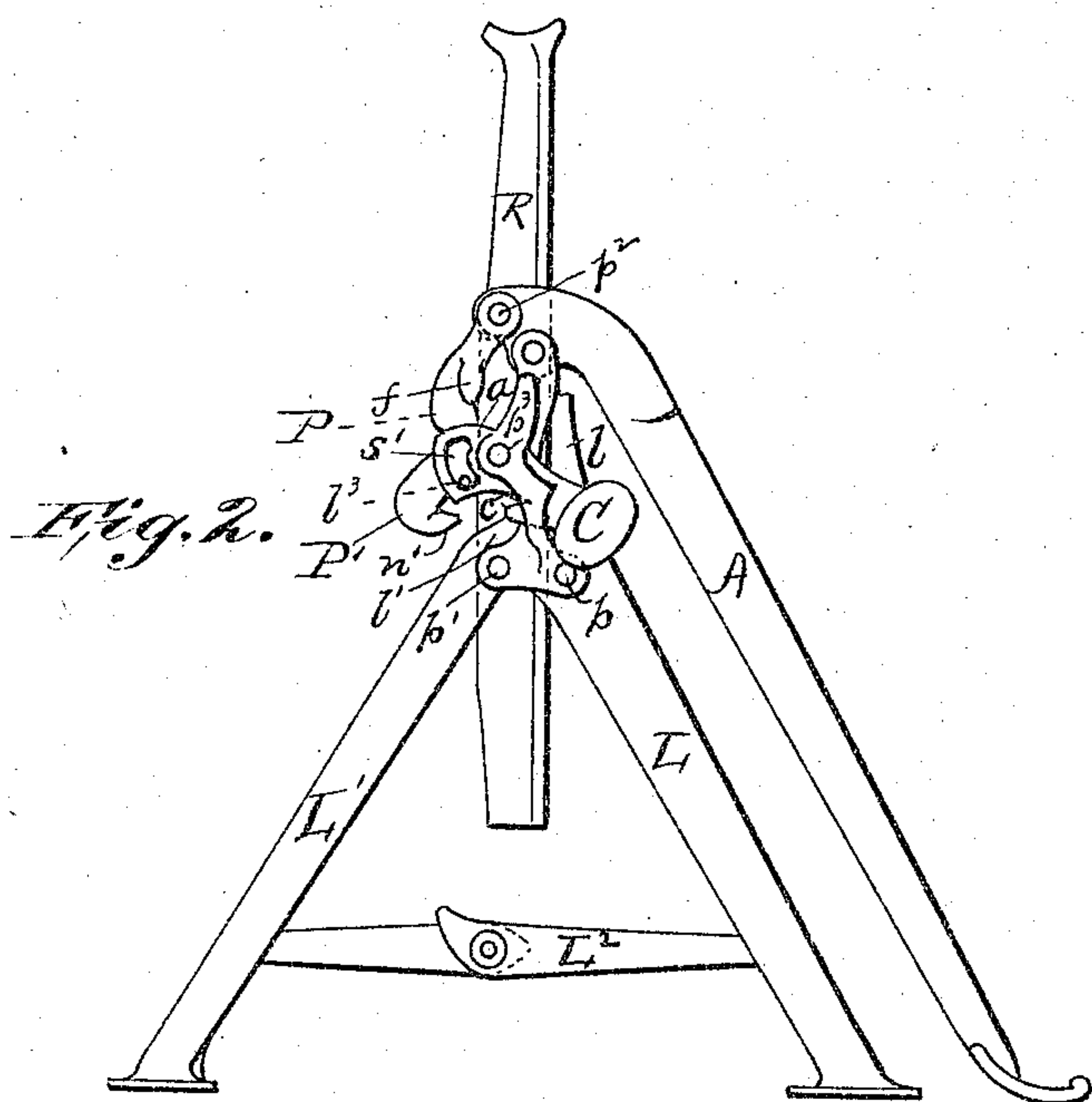
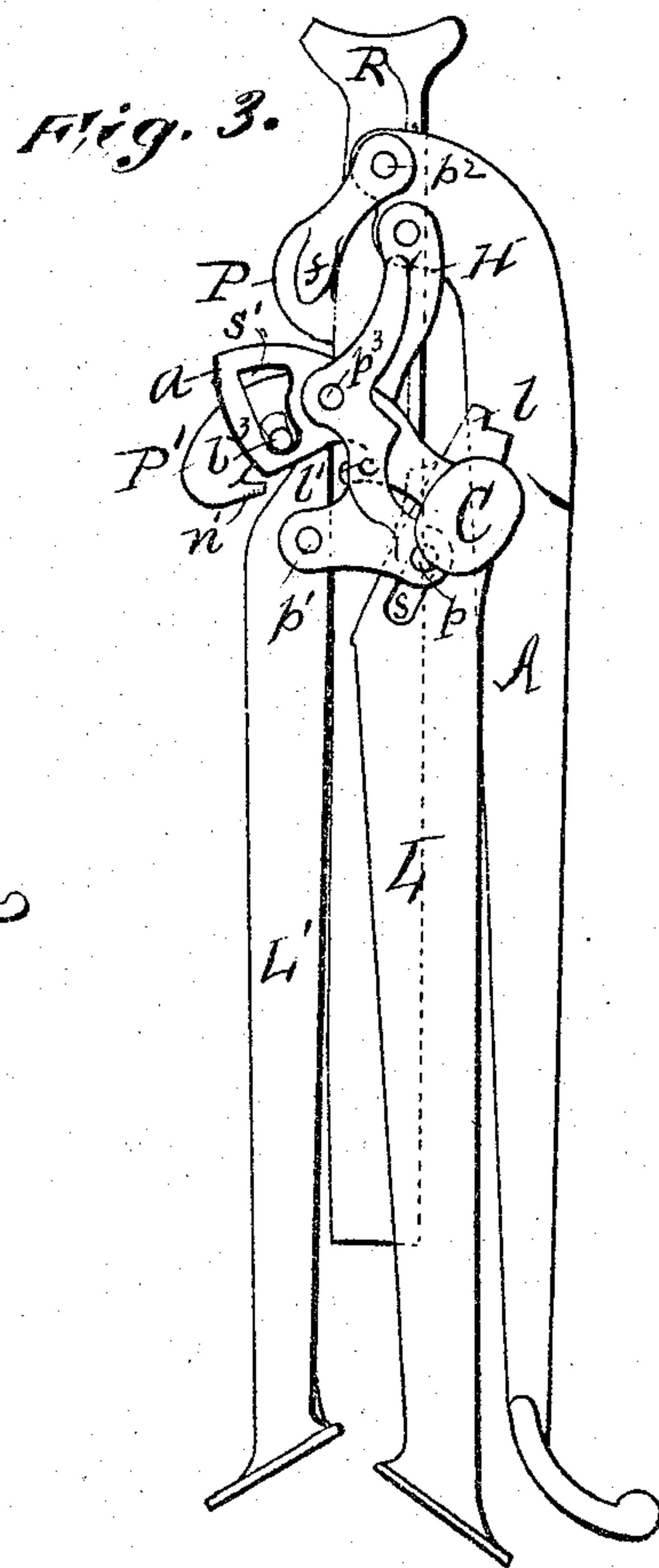
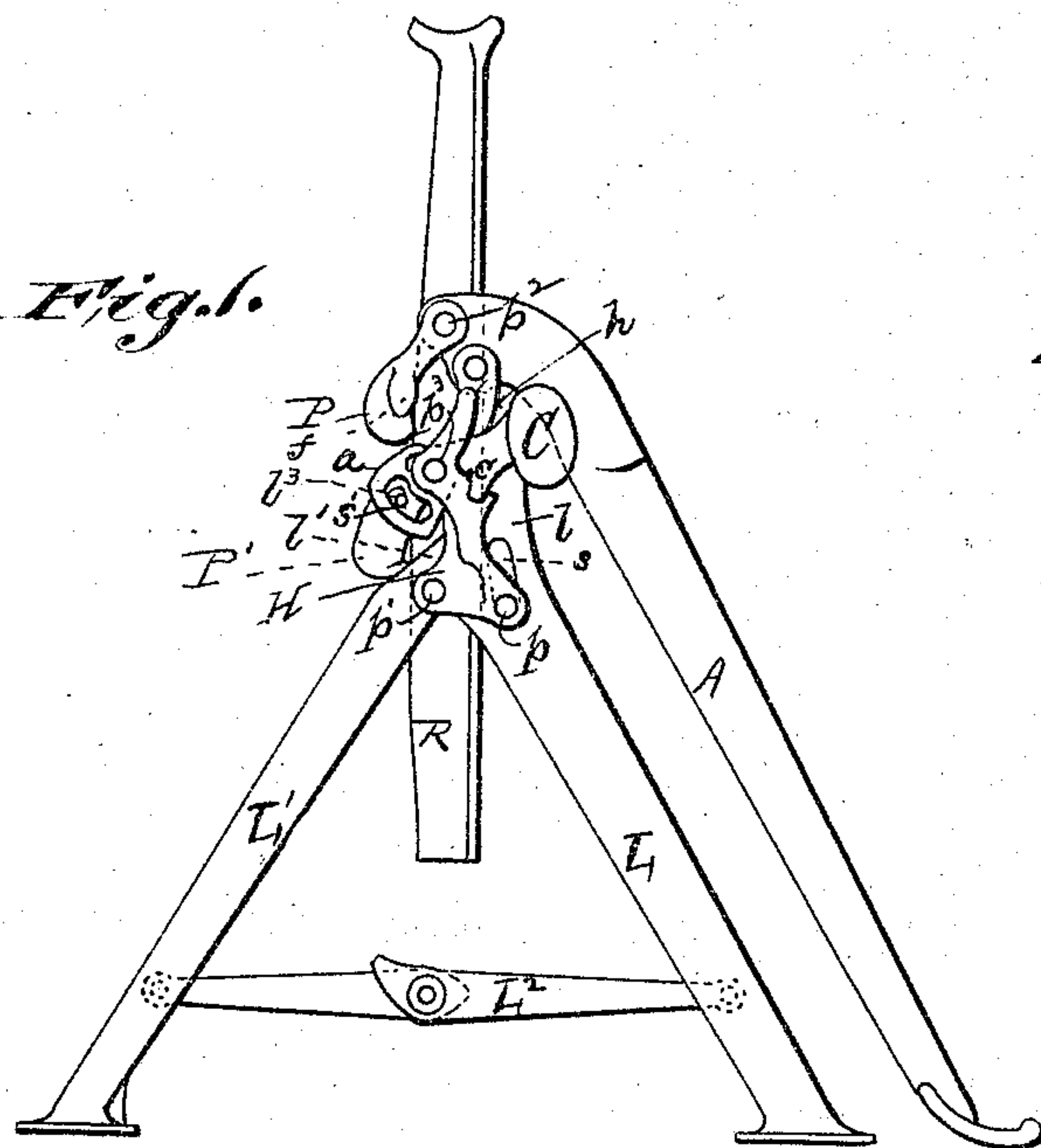
No. 782,421.

PATENTED FEB. 14, 1905.

A. SEARLS.
JACK.

APPLICATION FILED OCT. 17, 1902.

3 SHEETS—SHEET 1.



WITNESSES:

E. M. Benjamin
H. M. Vermilya

INVENTOR

Anson Searls

BY

H. M. Vermilya
his ATTORNEY

No. 782,421.

PATENTED FEB. 14, 1905.

A. SEARLS.
JACK.

APPLICATION FILED OCT. 17, 1902.

3 SHEETS—SHEET 2.

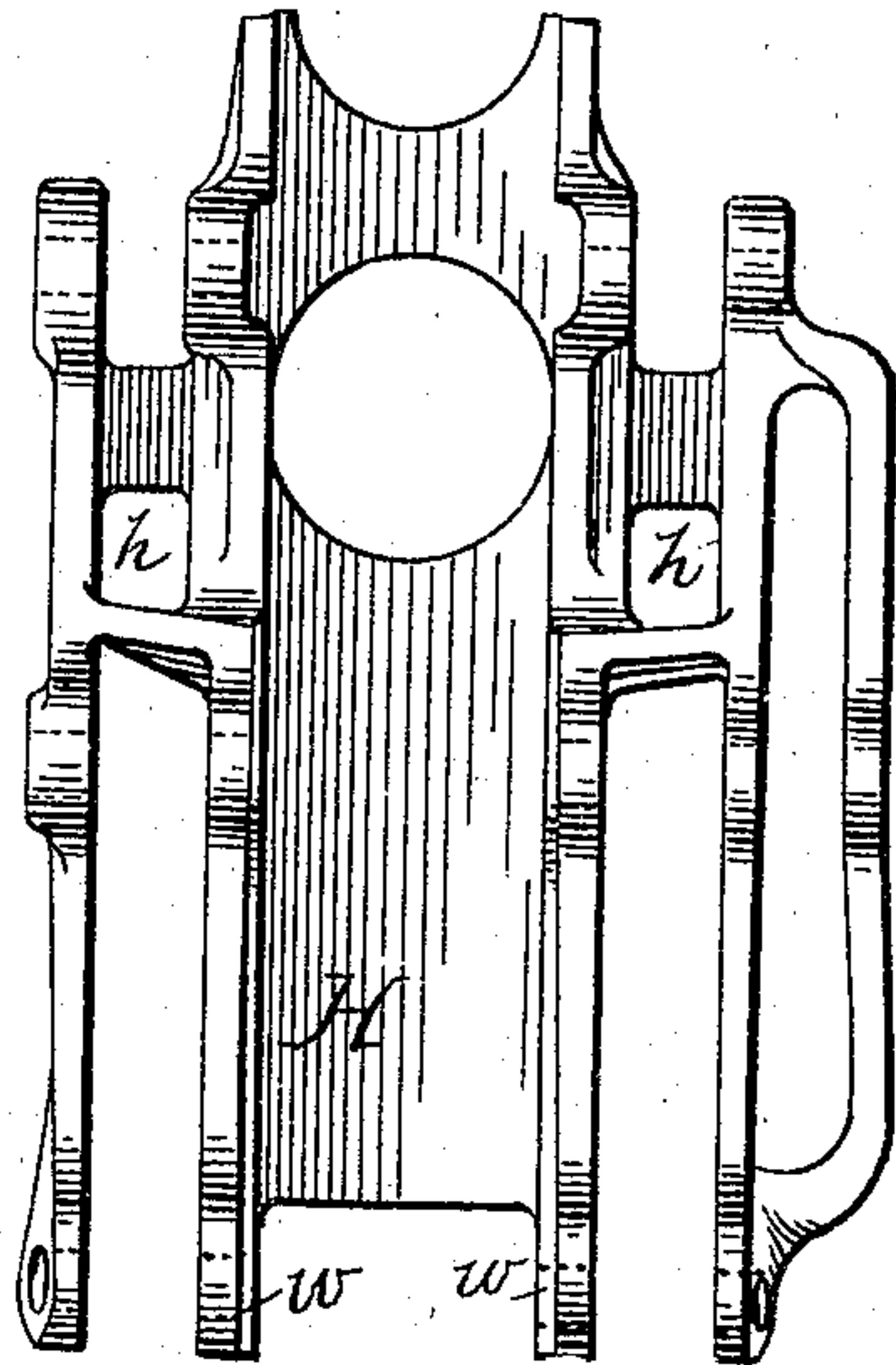
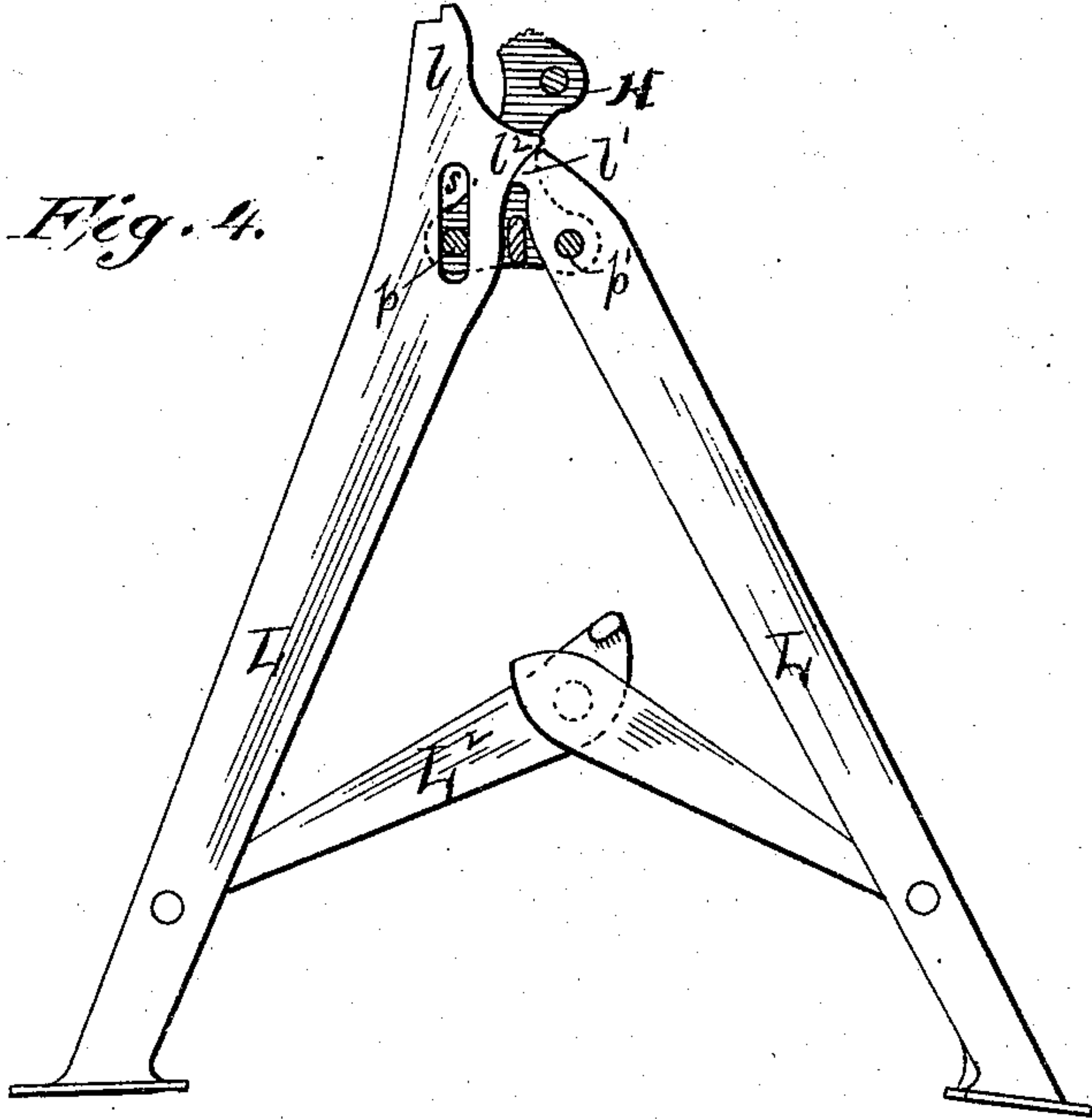


Fig. 6.

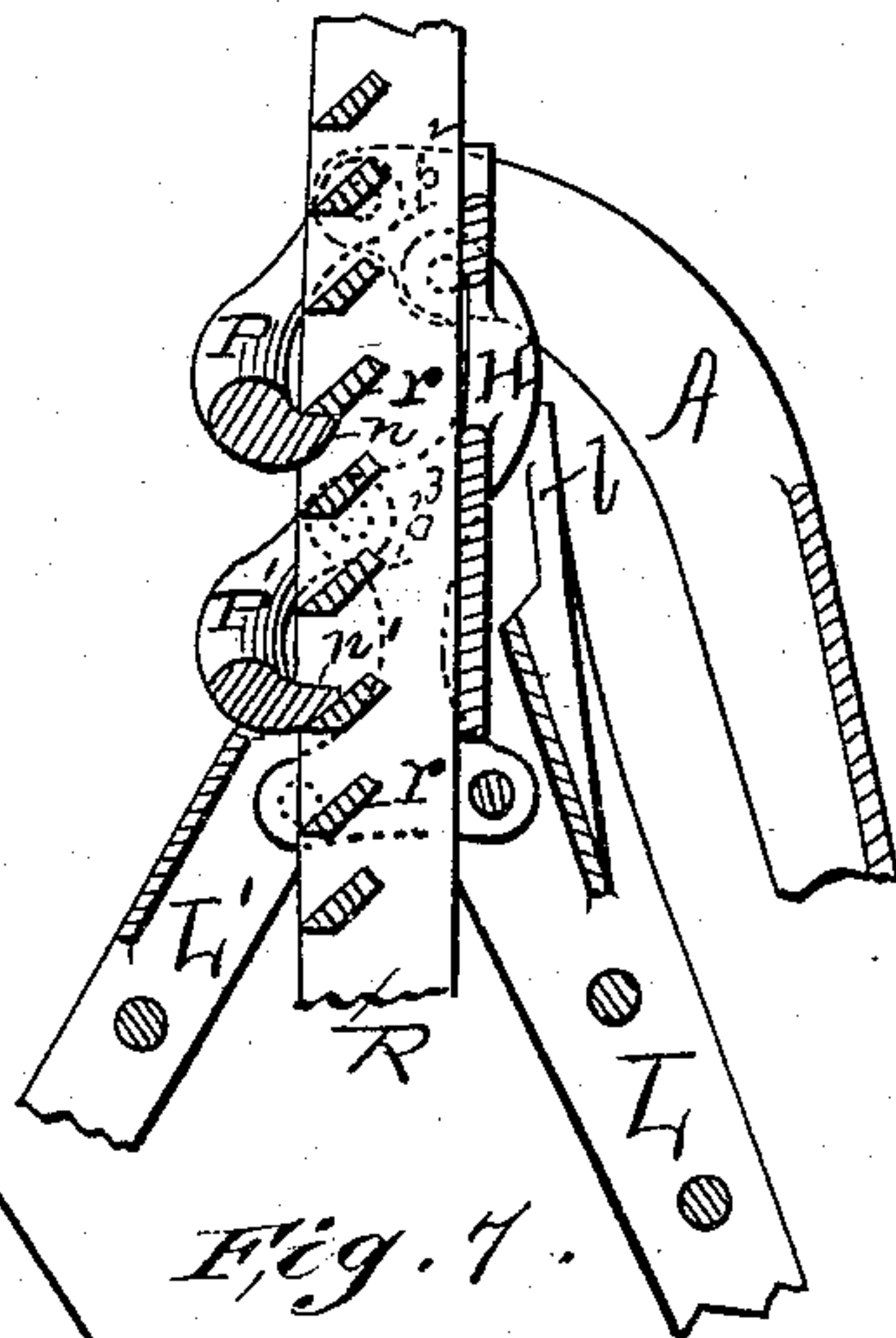
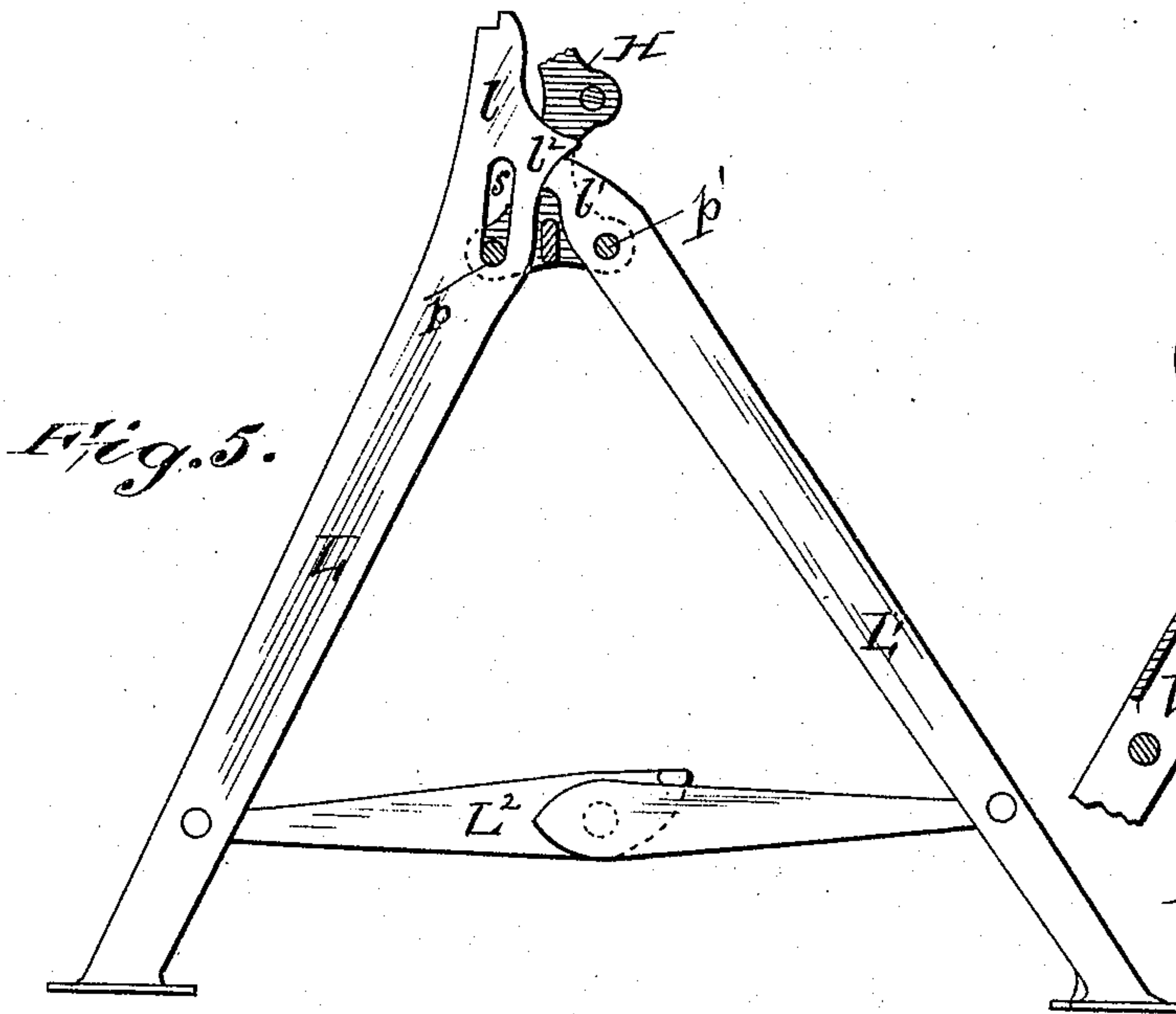


Fig. 7.

WITNESSES:

C. W. Benjamin
H. M. Vermilya

INVENTOR

Anson Searls
BY *H. M. Vermilya*
his ATTORNEY

No. 782,421.

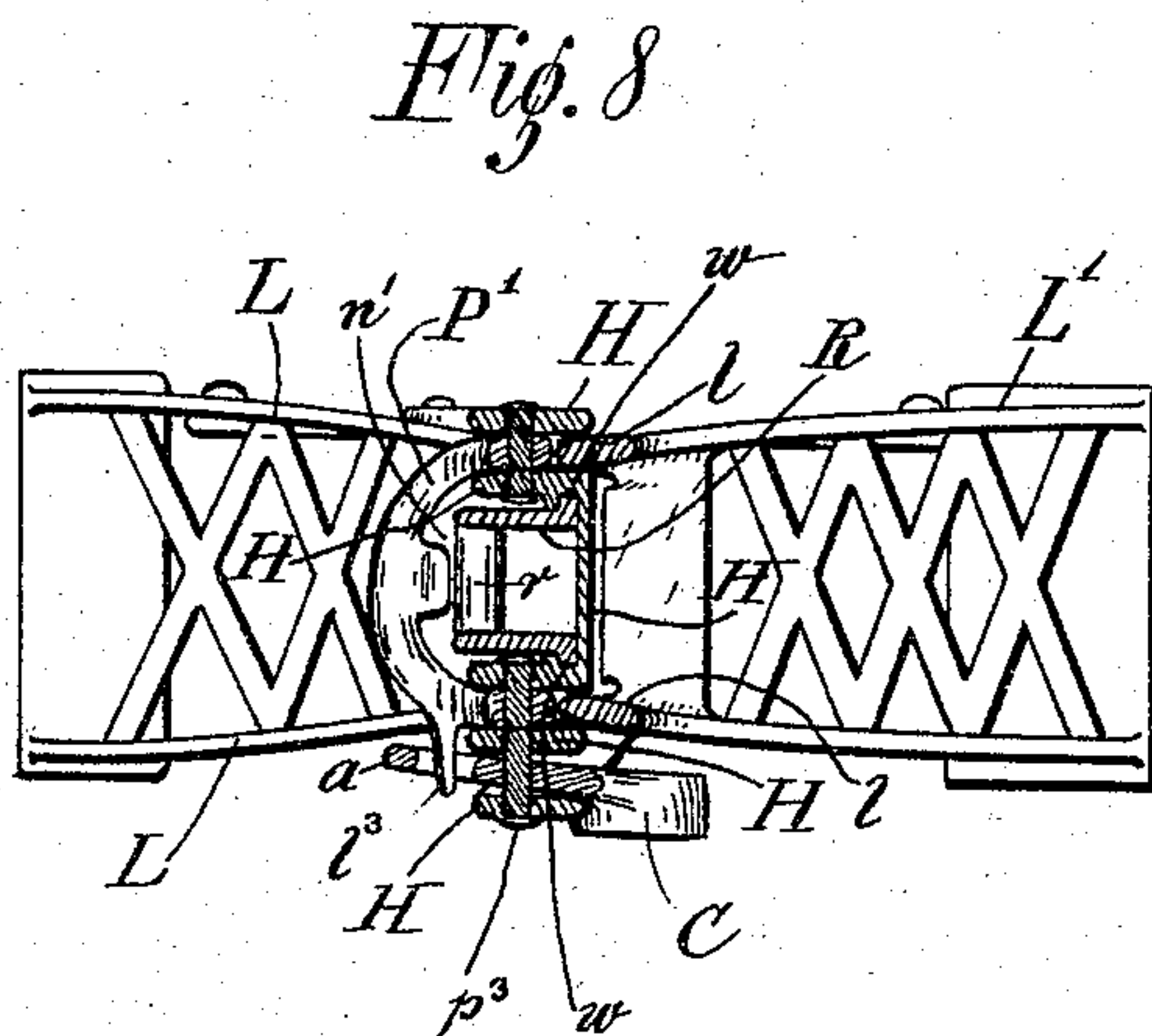
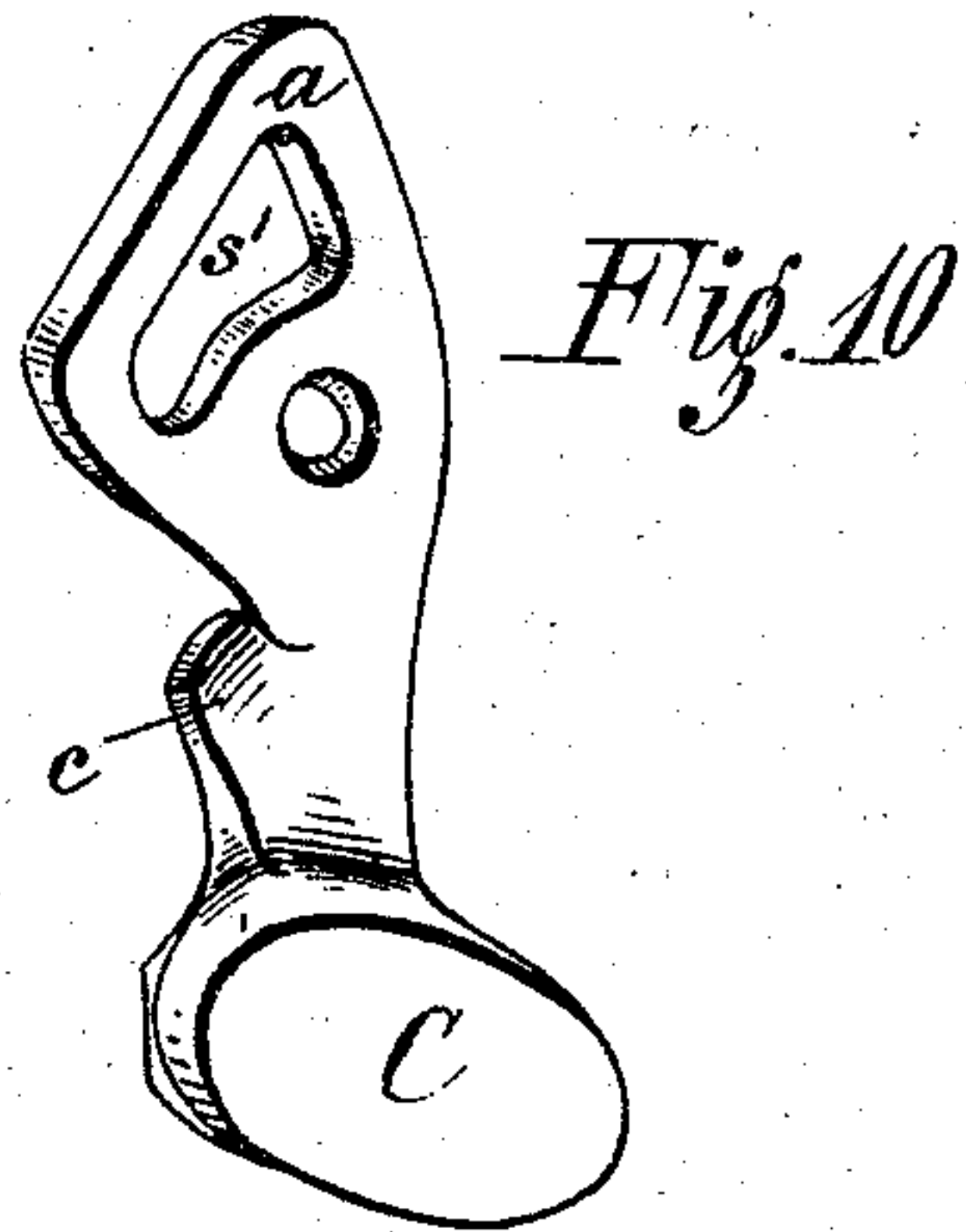
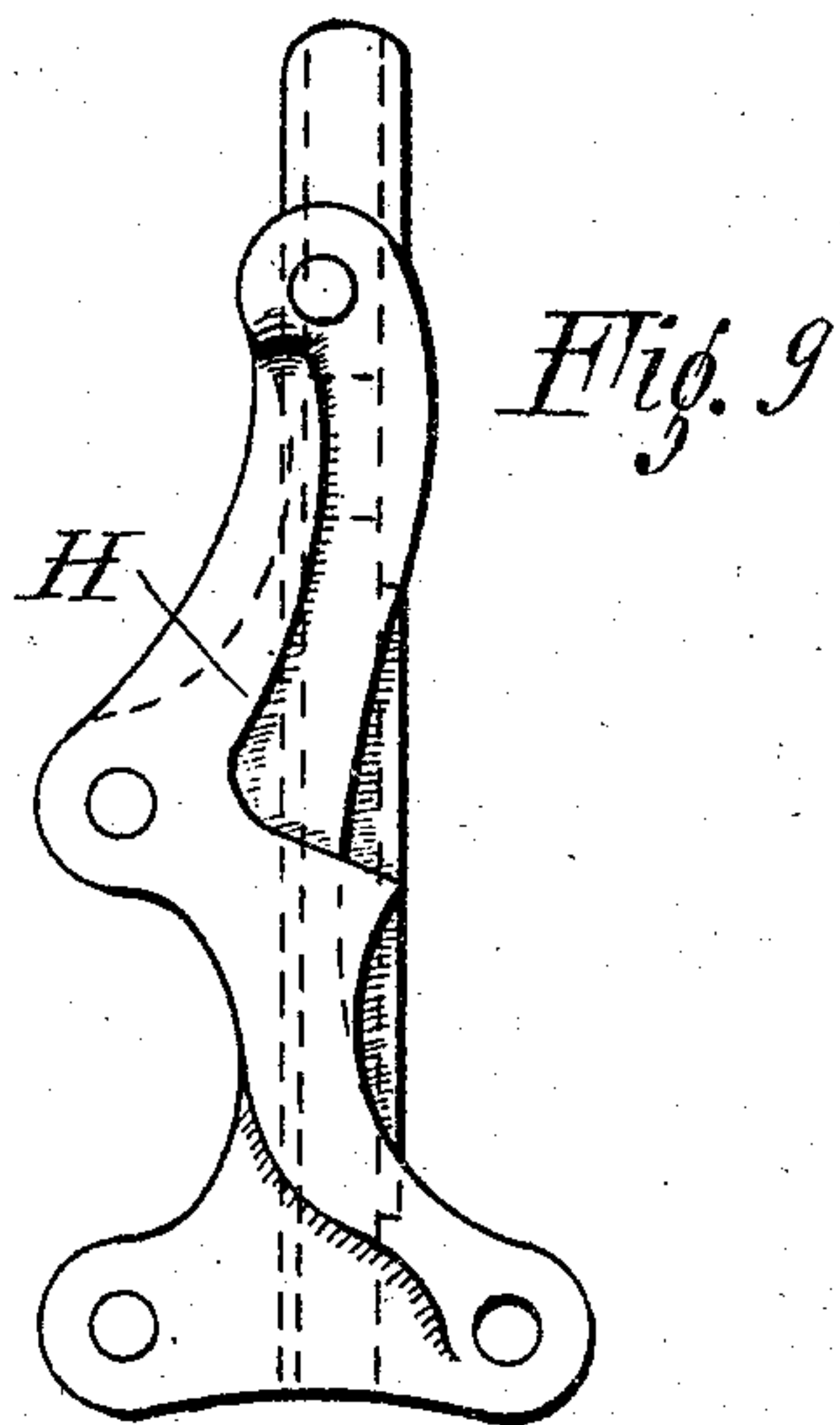
PATENTED FEB. 14, 1905.

A. SEARLS.

JACK.

APPLICATION FILED OCT. 17, 1902.

3 SHEETS—SHEET 3.



Witnesses
William H. Gilchrist
Thomas F. Kane

Inventor
Anson Searls
By his Attorney
A. H. N. Kinnally

UNITED STATES PATENT OFFICE.

ANSON SEARLS, OF NEWARK, NEW JERSEY.

JACK.

SPECIFICATION forming part of Letters Patent No. 782,421, dated February 14, 1905.

Application filed October 17, 1902. Serial No. 127,617.

To all whom it may concern:

Be it known that I, ANSON SEARLS, a citizen of the United States of America, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Jacks, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a view of a jack embodying my invention set in position to lift a body placed upon its lifting-bar. Fig. 2 is a view of said jack set to lower such a body. Fig. 3 shows the jack closed for transportation or packing. Fig. 4 is a side face view of the jack with a part of the head removed. Fig. 5 is a similar view showing the parts in course of being set. Fig. 6 shows the head of the jack disconnected from the other parts. Fig. 7 is a vertical sectional view of the upper parts. Fig. 8 is a horizontal cross-sectional view of the parts in the position of Fig. 2, but through pivot p^3 . Fig. 9 is an edge or side elevation of the head-piece H, a face view of which appears in Fig. 6; and Fig. 10 is an enlarged detail face view of the counterweight C.

My invention relates to lifting-jacks adapted to raise carriages and other vehicles, particularly automobiles, so that the wheels may be removed and replaced or other operations performed or repairs made, though its uses are not confined within these limits.

It consists in various features, more particularly pointed out in the claims, some of which are such an arrangement of the mechanism that the lifting or rack bar may be raised or lowered with a step-by-step movement, so pivoting the supports that they may be folded, making a conveniently-portable tool, a depression in the head of the lifting-bar, a pair of pawls for alternate engagement with the rack-bar, means for governing the engagement and disengagement of the pawls, a lever to operate the counterweight, a lever to aid in governing the pawls, a slideway or set of ways in which the rack may move, and an arrangement for preventing the wrong setting of the standard. These features are not all necessary to the operation one of the other,

though the entire combination is embodied in the complete jack as I prefer to construct it.

In its preferable form my jack consists in a head-piece H, to which are pivoted a pair of legs L L', though the legs might be pivoted one to the other, there might be but a single standard, and the head-piece might be made integral with that or with one leg. The legs are usually made in skeleton form for lightness and strength, and one, L, is preferably forked and slotted near its upper end, and the pivot extends through the slot s . The leg has extensions l , which are arranged to enter sockets or holes h in the head-piece when the legs are slid upward upon the pivot p . The other leg is also provided with extensions l' above its pivot p' , which extensions are arranged to take under projections on the first leg L, and thus form a firm base or standard for the jack, a folding link L^2 being supplied to add strength to the device when set. As will be noticed, the extensions l of legs L project in the form of lugs l^2 , which are so proportioned that they engage extensions l' and interfere with the swinging of leg L' on its pivot to its full throw until the leg L is slid up to a proper engagement of its extensions l with the socket-holes h , and an improper setting of the standard is thereby prevented. (See Figs. 4 and 5.)

The head-piece H, pivoted as described, or otherwise secured to the standard so that it will stand vertically when that is set upright, is provided with ways w , though I do not limit myself to the form shown, and in these ways I mount a lifting bar or rack R. Its form is preferably that of a ladder with a series of rounds, steps, or teeth r preferably constructed with their faces inclined at an angle other than a right angle to the axis of the bar, as they thereby hold better and aid in operating the pawls, though this is not absolutely essential, as inclines on the pawls might be caused to produce much the same effect.

Pivoted to the upper part of the head-piece H is a lever A, with a long arm and a short one. The long arm is intended to be operated by the hand or foot of the user. To the short arm of lever A, which is preferably

forked and so pivoted at p^2 as to bring its ends on the side of the head opposite to that on which the long arm lies, a hook or pawl P is linked. It is preferably V-shaped, with an inwardly and upwardly extending hook or nose n on the inside and hung with its nose lying normally within the line of the rack-teeth r , so that when the long arm of the lever A is raised the pawl P descends and takes under a tooth r of the rack, for the inclined face of the tooth r will tend to swing the pawl outward and permit it to pass down over the edge of the tooth, and its weight causes it to swing inward again and take under the said tooth.

Now if the long arm of lever A be forced down the short arm will be swung up, carrying the lifting-pawl P and of course lifting the rack R and carrying up with it any superimposed weight—such, for instance, as a vehicle axle and wheel. Pivoted to the head-piece at p^3 , preferably below pivot p^2 , is a second pawl, P', which I call the "holding-pawl." In form and arrangement it corresponds generally with pawl P, though set below and hung from the frame instead of the lever. Its nose n' slides over and drops under the teeth of the rack one by one as that is raised, and the stroke, and the space between the noses of pawls P and P' when they are at their limits of movement is preferably greater than the spaces between teeth r of the rack or a multiple of said spaces in order that pawl P' may take under one tooth an instant at least before pawl P reaches its limit of movement. When the long arm of lever A, having reached its downward limit of movement, is reversed and lifted for a new movement, the holding-pawl P' being in position will sustain the rack and its burden, while the long arm of the lever is carried up and pawl P is swung down for a new holding, and thus a very convenient and powerful combination for lifting weight is provided.

When we wish to lower the weight, and consequently the rack, some means must be provided for reversing the action of pawls P' and P. Pawl P' must hold the rack while pawl P ascends and release it when that is ready to descend, and pawl P must engage at or near the upper end of its movement and release at or near the lower end of that movement, and to accomplish this reversal I have provided a counterweight C. It may be and preferably is pivoted on pivot p^3 oppositely to pawl P', but has an arm a extending out on the same side with pawl P' and adapted to engage that pawl when desired. To accomplish that end, I have slotted its end, as seen at s' , and provided a lug l^3 on pawl P', which projects through the slot, the base of the slot and the position of the lug being so arranged that they will engage before the weight reaches the limit of its downward throw, and when it does reach that limit the pawl P' will be sufficiently raised to clear the teeth of rack r

and permit that to descend, the gravity of the weight being preferably but little, if any, more than that required to lift the pawl P'. This counterweight C is also provided with a catch c , adapted to engage with the side of the frame and hold it out of engagement with the lug l^3 when the lifting of the weight is proceeding, though I do not limit myself to this exact form of catch or engagement as shown. The weight is very loosely pivoted to permit crowding it to one side to cause the catch to engage; but we have also to provide for releasing pawl P and holding it from engagement, as above noted, and I find it convenient to make use of the same counterweight C for that purpose and to also make use of the added weight of pawl P to overcome the tendency of weight C to hold pawl P' out of engagement with the rack and permit such engagement just before pawl P completes its lowering movement, though such a combination is not the limit of my invention. For such purpose, however, I extend a finger f from pawl P, or so secured to it mediately or immediately as to be operated in unison therewith, adapted to engage the arm a of counterweight C.

Now assume the rack is set as shown in Fig. 2. The weight on the rack R is held by pawl P. Lug l^3 is in engagement with arm a of the counterweight, and pawl P' is held out of the path of the rack. The long arm of the lever A is lifted, and almost simultaneously (though not necessarily simultaneously) the finger f engages arm a and the weight of pawl P, and its load is added to that of pawl P' to counteract the stress of weight C, and that weight moves upward as pawl P moves downward, and thereby releases pawl P' and permits it to move downward and inward to its position for engagement with the descending tooth r of rack R. Before pawl P has reached its lower limit of motion the tooth r of rack R has reached and rested upon pawl P', and the further lowering of pawl P relieves it of the weight of the rack and its load, whereupon the counterweight, acting through arm a and finger f , will swing pawl P out of engagement with the rack, and it may be freely raised by depressing the long arm of lever A. The base of slot s' of course made contact with lug l^3 when this took place; but pawl P', being now reinforced by its added load, was too heavy to be swung out of engagement with the rack by the gravity of weight C and remained in position, holding the load, while pawl P raised for a new step. Counterweight C is held from a full descent by the engagement of arm a and lug l^3 , and before pawl P reaches its upper limit of movement the finger f will of course leave arm a , and there is therefore nothing to prevent the gravity of pawl P from returning it to a point within the line of teeth r . It then engages a tooth r , and just before it reaches its full upward throw it will lift the rack and its weight

slightly, because of the before-mentioned relative spacing of the parts. The instant this lifting of the rack and weight from pawl P' occurs the weight of the pawl P' will be overcome by the counterweight C, and it will be swung outward to the position shown in Fig. 2, and the device is ready for another downward step. If it be desired to avoid the step-by-step movement downward and drop the rack at one movement, it is only necessary to hold the counterweight down by the hand or foot or a suitable catch when in the position shown in Fig. 2. Pawl P' is out of engagement, pawl P will then be forced out, and the rack and its load will come down with a run; but this is not ordinarily desirable.

The head of the lifting-bar is preferably extended upward at two sides and outward at the other, as shown, to take over a nut or bolt or rod.

When the jack is not in use for lifting or holding, it is only necessary to spring up the hinged link L², pull the extensions l out of their socket h, and fold the parts together, when it can be packed in very small compass in a tool-box or other receptacle. It is of great strength, exceedingly convenient, light in weight, may be operated by the foot when set under a vehicle where it would be difficult to reach the lever with the hand, and so designed as to be readily and cheaply made.

What I claim, and desire to secure by Letters Patent, is—

1. In a lifting-jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl pivoted to the standard and swinging in the path of the rack, an operating-lever, a carrying-pawl secured to said operating-lever and swinging in the path of the rack, and means substantially as set forth, for releasing the carrying-pawl at the lower part of its stroke, for disengaging the holding-pawl at the upper part of the stroke of the carrying-pawl and for holding it out of engagement during the major part of the lowering stroke of said carrying-pawl.

2. In a lifting-jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl pivoted to the standard and swinging in the path of the rack, an operating-lever, a carrying-pawl secured to said operating-lever and swinging in the path of the rack, a counterweight provided with an arm engaging the holding-pawl, a trip secured to the carrying-pawl, and a counterweight provided with an arm engaging the carrying-pawl, all substantially as set forth.

3. In a lifting-jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, a carrying-pawl secured to said operating-lever and swinging in the path of the rack, a counterweight provided with an arm engaging the holding-pawl, and a trip secured

to the carrying-pawl, adapted to intermittently engage and release the counterweight, all substantially as set forth.

4. In a lifting-jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl pivoted to the standard and swinging in the path of the rack, an operating-lever, a carrying-pawl secured to said operating-lever and swinging in the path of the rack, a counterweight provided with a slotted arm, a leg on the holding-pawl, extending into the slot of the counterweight-arm, and a trip secured to the carrying-pawl and adapted, as described, to intermittently engage and release the counterweight, all substantially as set forth.

5. In a lifting-jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl pivoted to the standard and swinging in the path of the rack, an operating-lever, a carrying-pawl secured to said operating-lever and swinging in the path of the rack, a counterweight provided with an arm engaging the holding-pawl, a trip secured to the carrying-pawl, and a counterweight provided with an arm engaging the carrying-pawl, and a catch adapted as described to hold said counterweight out of operative position, all substantially as set forth.

6. In a lifting-jack the combination of a standard, composed of two legs pivoted one to the other, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

7. In a lifting-jack the combination of a standard, composed of a head-piece, provided with ways and two legs pivoted to swing toward and from each other, a rack arranged to reciprocate in the ways of the standard, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

8. In a lifting-jack the combination of a standard, composed of two legs pivoted to swing toward and from each other, one of said legs being slotted at the pivot-aperture, a projection secured to one leg, a stop which engages with said projection when the pivot is in one part of the slot, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

9. In a lifting-jack, the combination of a standard, composed of two legs pivoted to swing toward and from each other, one of said legs being slotted at the pivot-aperture, an extension on one leg, a socket in the standard

adapted to receive said extension, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

10. In a lifting-jack the combination of a standard, composed of two legs pivoted to swing toward and from each other, one of said legs being slotted at the pivot-aperture, a projection secured to one leg, a stop which engages with said projection when the pivot is in one part of the slot, a folding link hinged to the legs of the standard, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

11. In a lifting-jack the combination of a standard, composed of two legs pivoted to swing toward and from each other, one of said legs being slotted at the pivot-aperture, a projection secured to one leg, a stop which engages with said projection when the pivot is in one part of the slot, an extension on one leg, a socket in the standard adapted to receive said extension, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever, and a lifting-pawl secured to said lever and swinging in the path of the rack, all combined substantially as set forth.

12. A folding jack composed of a head-piece H, having ways w , and a socket h , pivoted legs L, L' , provided with extensions l, l' , a lug l^2 , on leg L , and a slot s , in said leg, a lifting-bar R , provided with teeth r , a lever A , a carrying-pawl P , having nose n , secured to lever A , a finger f , a holding-pawl P' , having nose n' , and provided with a lug l^3 , and a counterweight C , provided with an arm a , slotted at s' , and a catch c , all combined substantially as set forth.

13. A folding jack, composed of a head-piece

H, having ways w , and a socket h , pivoted legs L, L' , provided with extensions l, l' , a lug l^2 , on leg L , and a slot s , in said leg, a lifting-bar R , provided with teeth r , a lever A , a carrying-pawl P , having nose n , secured to lever A , a finger f , a holding-pawl P' , having nose n' , and provided with a lug l^3 , a counterweight C , provided with an arm a , slotted at s' , and a catch c , and an adjustable link adapted to limit the separation of the lower ends of the standard-legs, all combined substantially as set forth.

14. In a jack, the combination of a standard, a rack arranged to reciprocate thereon, a holding-pawl, pivoted to the standard and swinging in the path of the rack, an operating-lever and a lifting-pawl secured to said lever, the space between the teeth of the rack, being less than the space between the engaging faces of the pawls, at their limit of separation and less also than the stroke of the lifting-pawl, all substantially as set forth.

15. In a jack, the combination of a standard, two or more legs, one of which is pivoted to swing in and out and provided with an extension projecting above the point of pivot, and engaging the standard, a rack arranged to reciprocate upon the standard and means for changing the relative position of said rack, all substantially as set forth.

16. In a jack, the combination of a standard, a rack arranged to reciprocate thereon, a pivoted holding-pawl swinging in the path of the rack, an operating-lever pivoted to the standard at the highest practicable point, and at or near its extreme upper end, and a lifting-pawl secured to said lever and swinging in the path of the rack.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of October, 1902.

ANSON SEARLS.

Witnesses:

JOE O'CONNOR,

A. G. N. VERMILYA.