

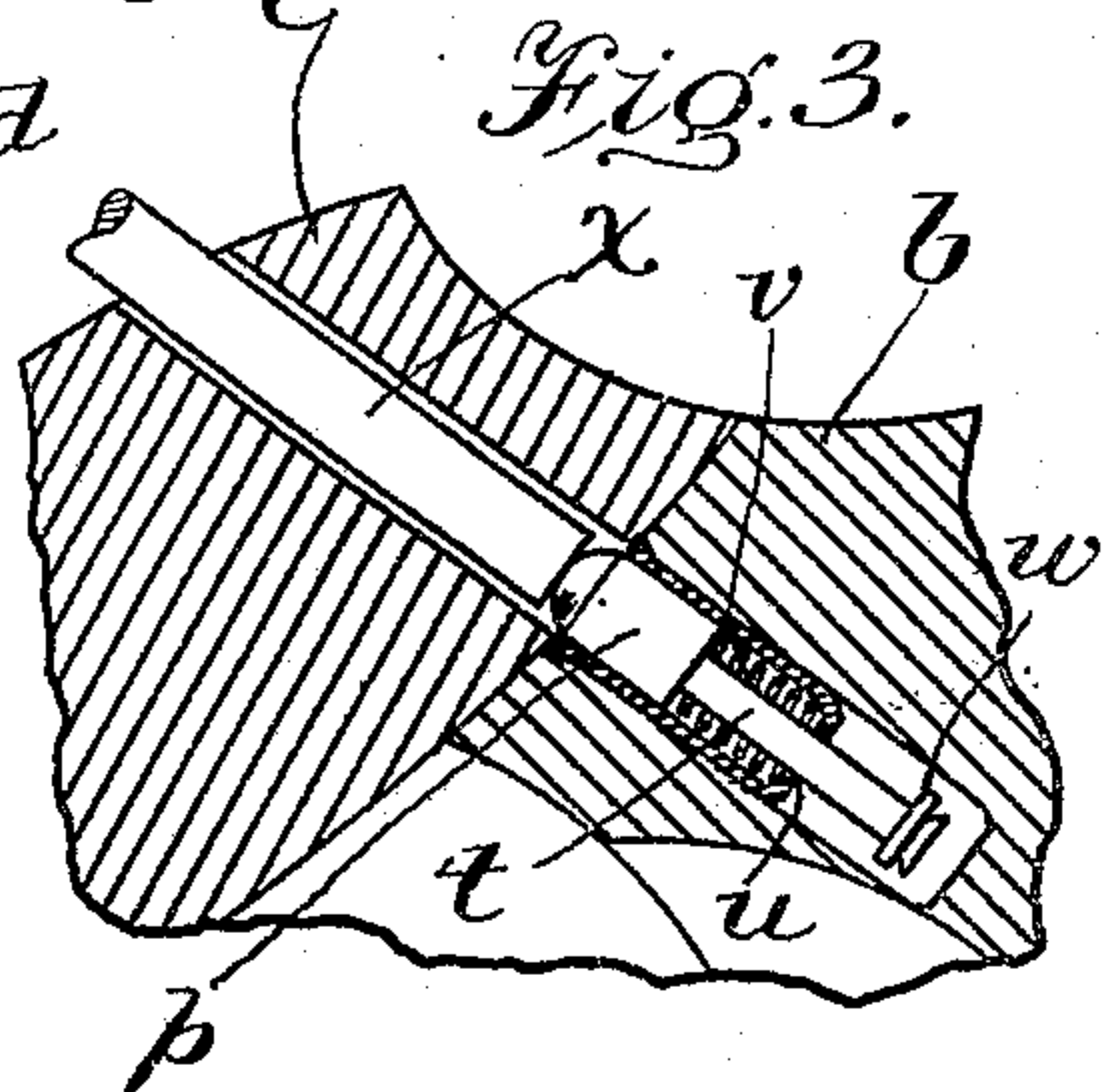
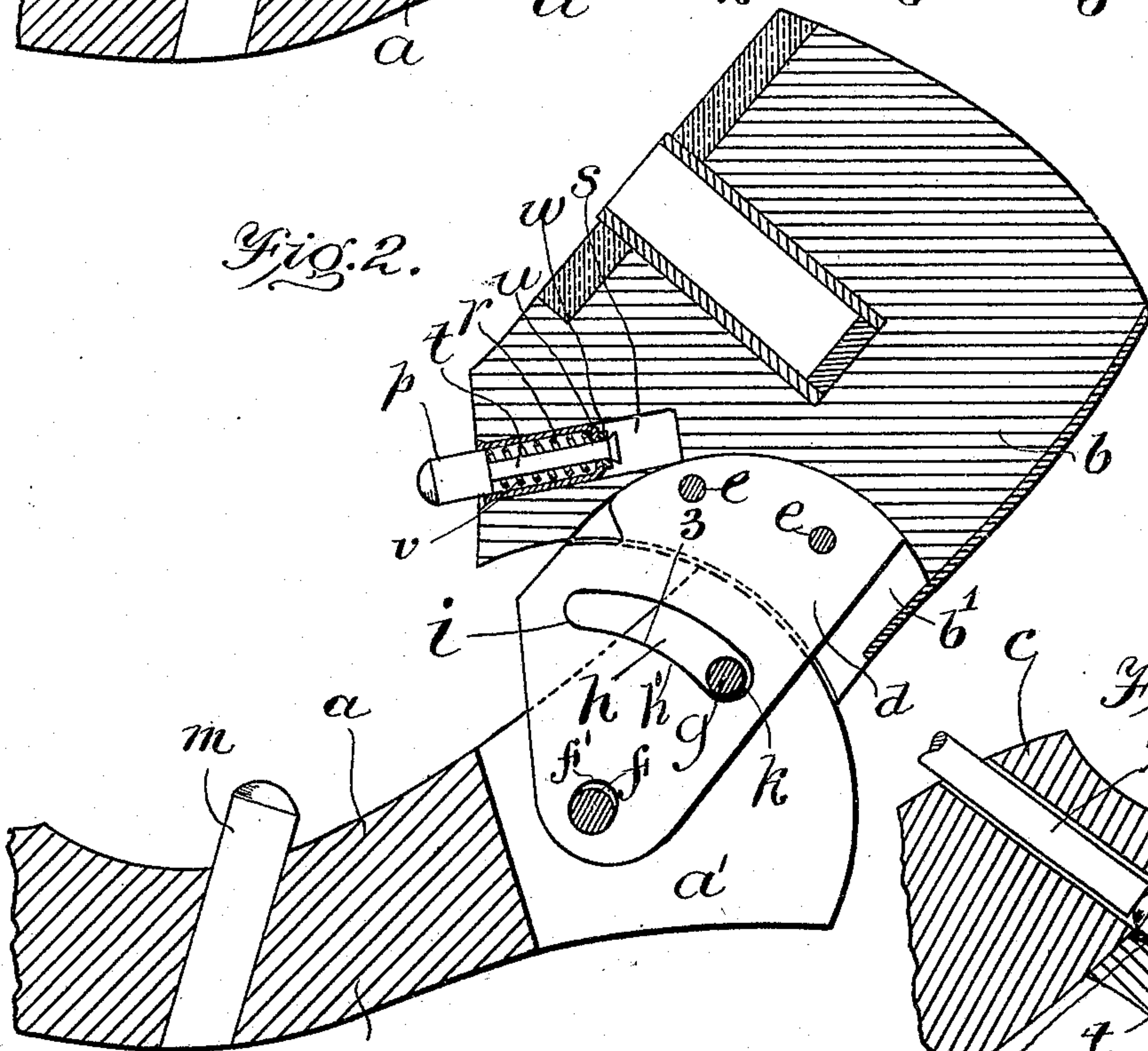
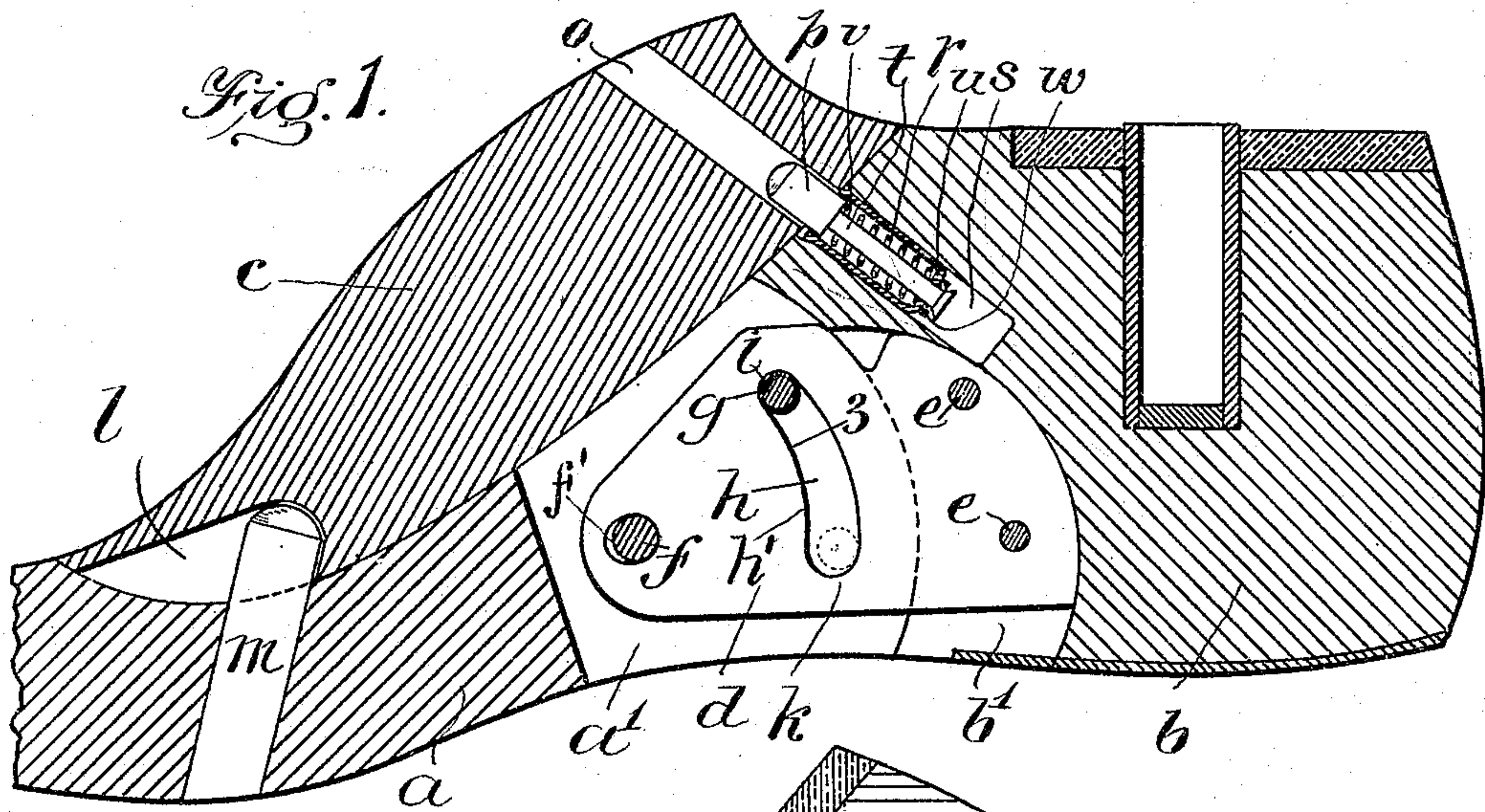
J. T. BROWN.

LAST.

APPLICATION FILED DEC. 16, 1904. RENEWED JAN. 29, 1908.

915,736.

Patented Mar. 23, 1909.



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# UNITED STATES PATENT OFFICE.

JONATHAN T. BROWN, OF MARBLEHEAD, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KRENTLER-ARNOLD HINGE LAST COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

LAST.

No. 915,736.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed December 16, 1904, Serial No. 237,104. Renewed January 29, 1908. Serial No. 413,267.

*To all whom it may concern:*

Be it known that I, JONATHAN T. BROWN, of Marblehead, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Lasts, of which the following is a specification.

One of the objects of my invention is to provide an exceedingly strong hinged last of the knuckle-and-socket type of joint, and a further object of my invention is to provide such a last of the block-last type (being thereby even stronger than a mere knuckle-and-socket last considered alone).

The above and other objects and advantages of the invention will appear more fully from the following description, taken with reference to the drawings, in which a complete embodiment of the invention in all its preferred details is shown.

In the drawing,—Figure 1 represents a longitudinal section of a last embodying my invention, showing the last in extended position, with the instep-block in place. Fig. 2 represents a similar view, showing the instep-block removed and the fore and heel parts in collapsed position. Fig. 3 represents a detail sectional view showing the position of the locking means for the block when the latter is about to be removed.

The forepart *a* and heel-part *b* are severed along a curved line of cut and provided centrally with vertical kerfs *a'*, *b'*, thereby forming at the lower rear end of the forepart twin knuckles projecting rearwardly, separated by the vertical kerf or slot *a'*, and at the lower front end of the heel-part a recess to receive the lower rearends of said knuckles.

In the preferred embodiment of my invention, I provide an instep block *c* to lock the last in rigid lengthened relation after the manner of a block last. A vertical hinge plate *d* occupies the kerfs or slots *a'*, *b'*, being pivotally connected to one last part and rigidly to the other, the rigid connection being herein shown in the heel-part, where the hinge plate is secured by pins *e*, being pivoted to the forepart by a pin *f*. The vertical hinge plate contains a curved slot *h* preferably slightly eccentric to the pivot pin *f*, said slot being so located and of such a length that it coöperates with a stop pin *g* to limit

the swinging movement of the heel-part properly for lengthened and shortened positions. The stop pin *g* extends transversely through the twin knuckles and kerf above horizontal alinement with the pin *f*, and lies in the general direction of said pivot pin and the upper front inclined wall of the forepart when the last is in lengthened position. In other words, the stop pin is so located that it does not introduce weakness into the knuckle joint construction as would be the case if it were in horizontal alinement with the pivot pin, which would produce a tendency to split the wood of the last along the line of natural cleavage, it being understood that the grain of wooden lasts runs lengthwise of the last. The stop pin is above the pivot, and therefore comes in the broadest and strongest cross sectional portion of the waist of the last, and hence has a maximum resistance even though located rather close to the end of the forepart. It is located not only out of horizontal alinement with the pivot, but in the thickest portion of the waist of the last where it has the maximum support of the surrounding wood. The result is that the strains due to leveling pressure and the like are distributed by the various pins and pivot to the adjacent wood of the knuckles in such directions and with such mutual relations as effectually to prevent the battering down of the wood and the pulling lengthwise of the pivot pin.

By making the slot *h* slightly eccentric with the upper end of the forward surface *h'* of the slot at a greater distance from the pivot *f* than the lower end, thereby inclining said surface upwardly toward the curved forward surface of the heel-part, the last is held in more stable position when lengthened.

The ends *i* *k* of the slot constitute abutments which engage the pin *g* and prevent the parts moving too far when the last is respectively extended or collapsed and the eccentric edge *h'* of the slot *h* forms a cam surface which, bearing against the pin *g* while the heel part is being turned into the extended position of the parts, acts to force the heel block forward into contact with the curved rear end of the fore part. Con-



versely, when the heel block is raised to collapse the last, the recession of the surface  $h'$  away from the pin  $g$  toward the pin  $f$  and the elongation of the hole  $f'$  allow the heel block to be drawn away from the fore part to separate the meeting surfaces of these parts by a slight amount in order to avoid binding and sticking of the parts due to swelling of the wood of the last when it has become damp. The elongated hole  $f'$  extends in such a direction as to permit separation of the heel block in the direction of its length from the fore part and yet prevent any lateral play when the parts are extended. When in this position the pin  $f$  bears against the lower and rear sides of hole  $f'$ , while the pin  $g$  is wedged against the upper end of the cam surface  $h'$  and the abutment  $i$  of the plate, thus forming a rigid connection, all the parts of which are metallic, which is independent of the wood of the last and securely retains the fore and heel parts exactly in correct alinement, whether the wood of the last sections be in contact or not, and firmly resists pressure tending to break the last during the various operations in the manufacture of the shoe.

The instep-block is provided with a socket  $l$  at its lower end, which is adapted to extend over and engage a pin  $m$  carried by the fore part, and has in its upper portion a hole into which a spring-pressed bolt  $p$ , carried by the heel part, may project. The bolt is mounted in a sleeve  $r$  set into a hole  $s$  in the heel part, and is provided with a stem  $t$  of reduced diameter, which projects through an opening  $u$  in the inner end of the sleeve. A spring  $v$  surrounds the stem  $t$ , and presses against the head of the bolt to project the latter, being prevented from forcing the bolt entirely out of the sleeve, by a washer  $w$  which is secured to the stem  $t$  near its end and engages the end of the sleeve. The spring yields to permit the bolt to be depressed while the instep-block is being applied, and when the block is in position, the hole  $o$  being then in line with the hole  $s$ , projects the bolt outward into the hole  $o$  and locks the block in place. The pin  $m$  and bolt  $p$  being inclined toward each other, prevent the block from being removed except when the pin is depressed, as shown in Fig. 3, by a last-hook or pin  $x$ .

It will be seen that the instep-block can be applied only when the fore and heel parts are in fully turned extended position, with the pin  $g$  bearing against the end  $i$  of slot  $h$ , and that after it has been set in place and as long as it remains there, the fore and heel parts cannot be collapsed, nor can the block be removed, as has been already stated, except upon depression by external means, of the pin. It is thus evident that when the parts are assembled, they are all securely

locked in position, the instep-block acting to hold the fore and heel parts rigidly locked in extended position, while the pins and bolt carried by the fore and heel parts and the abutment  $i$  on the union securely retain the block in place. Thus the parts are rigidly connected, and coöperate to constitute what is for all practical intents and purposes, a solid last while in use, but which yet can be readily taken apart and collapsed when necessary.

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

1. A divided last, having a forepart provided at its lower rear end with twin knuckles projecting therefrom, separated by a vertical slot, the heel-part provided at its lower front end with a recess to receive the lower rear ends of said knuckles, a hinge plate set vertically in said vertical slot, rigidly secured to the heel-part, and a transverse pivot pin extending through the front lower end of said hinge plate and the adjacent wood of the forepart, said plate being provided with a curved slot, a stop pin extending transversely through said knuckles and vertical slot out of horizontal alinement with said pivot pin occupying said curved slot in position to engage said plate and halt the swinging movement when the last parts reach lengthened position.

2. A last comprising a fore part, a heel part, a union pivotally connecting said parts, said union comprising a plate having an abutment thereon said plate connected rigidly to one of said parts and pivotally to the other, an abutment on the part to which the union is pivotally connected, an instep-block, and projections carried by said fore and heel parts and arranged to engage said instep-block only when the abutments on the fore part and union are in contact, the said union having means to guide the heel-part in a path eccentric to the pivotal connection to force the heel-part into contact with the rear end of the fore-part as it is moved to position to extend the last.

3. A last comprising a fore part, a heel part, a union consisting of a plate rigidly connected to said heel part and extended into a slot in the fore part, a pin pivotally connecting said union to said fore part, an abutment formed on said union, a second pin mounted on said fore part and arranged to engage said abutment when the fore and heel parts are in extended position, an upstanding pin fixed in the fore part, a bolt slidably mounted in the heel part and inclined relatively to the last-mentioned pin, and an instep-block having provisions for engaging said last-mentioned pin and said bolt, the arrangement being such that the bolt can engage and lock said instep-block

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extend the last.

In testimony whereof I have affixed my  
signature, in presence of two witnesses.

JONATHAN T. BROWN.

Witnesses:

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