

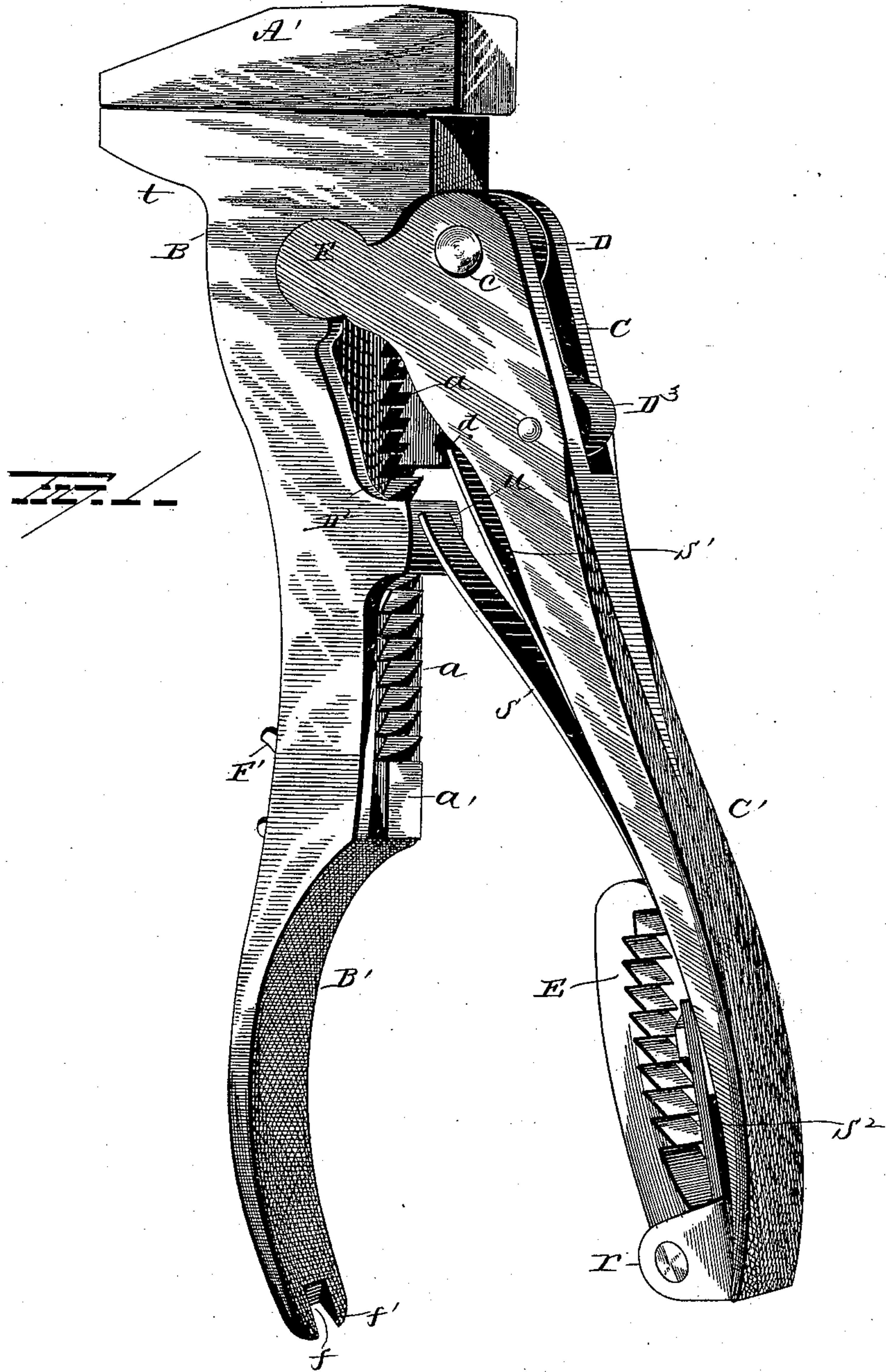
(No Model.)

3 Sheets—Sheet 1.

C. M. BROWN.
ADJUSTABLE WRENCH.

No. 370,447.

Patented Sept. 27, 1887.



Witnesses
E. J. Nottingham
G. F. Downing

Inventor
Charles M. Brown

By his Attorney
H. A. Symonds

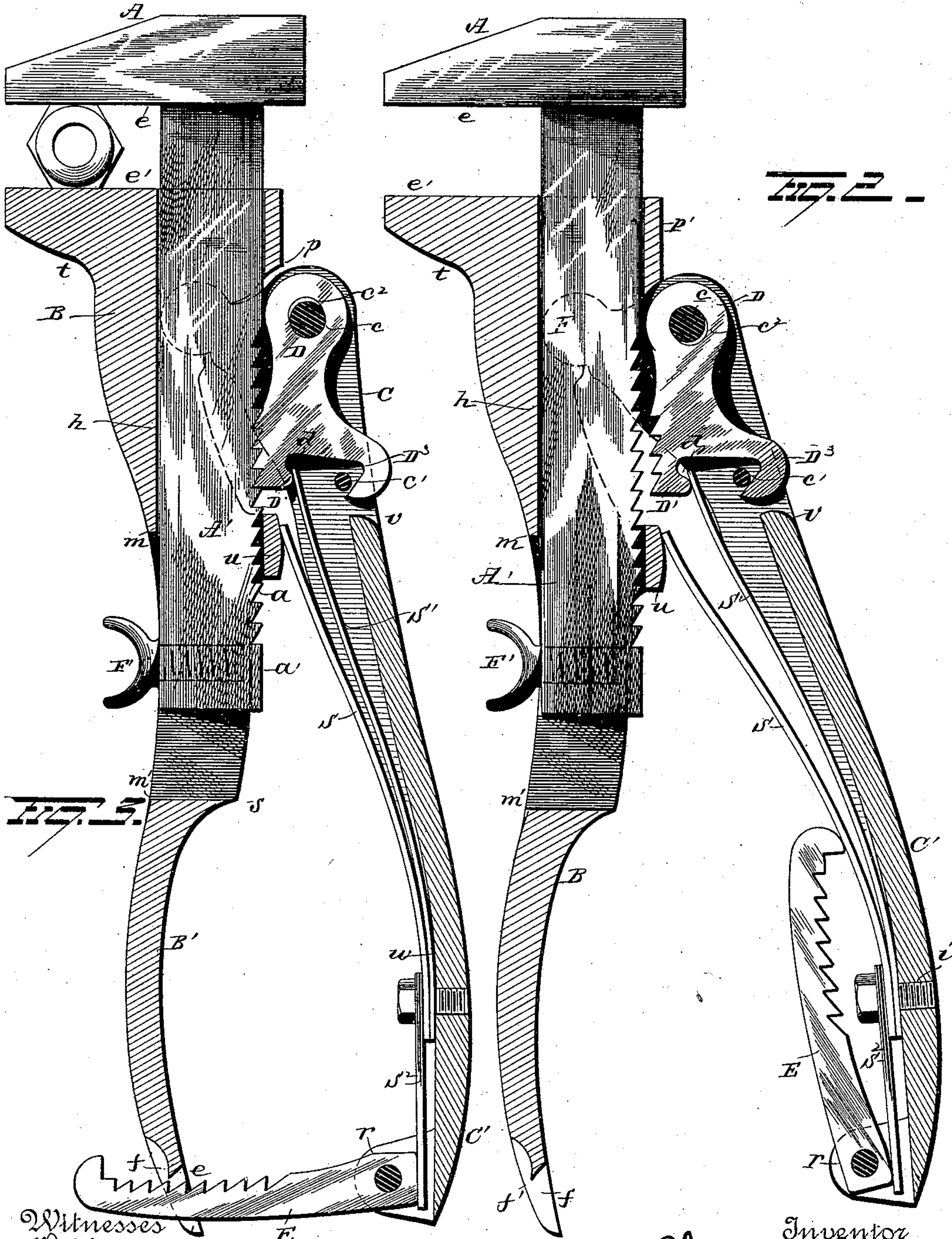
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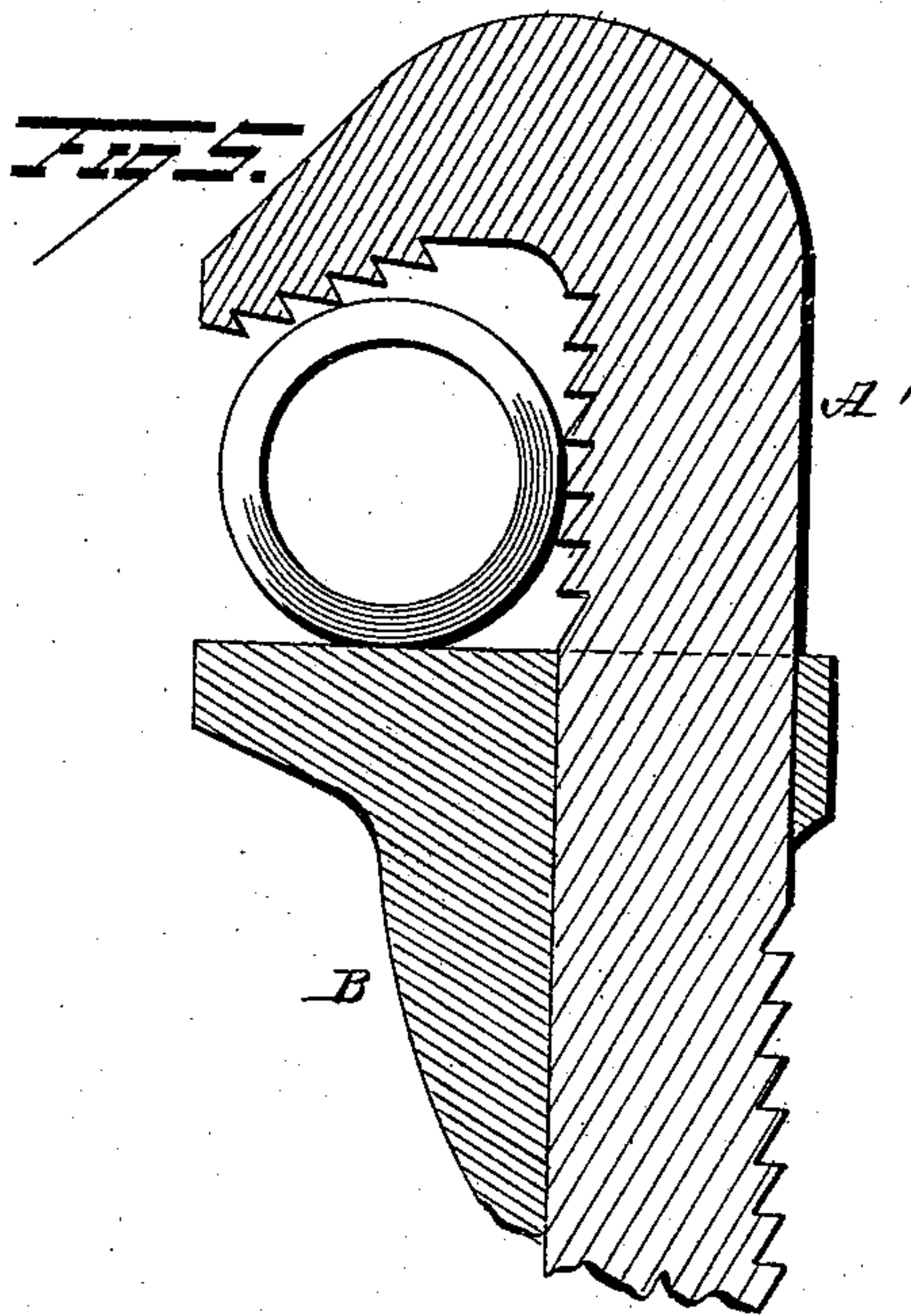
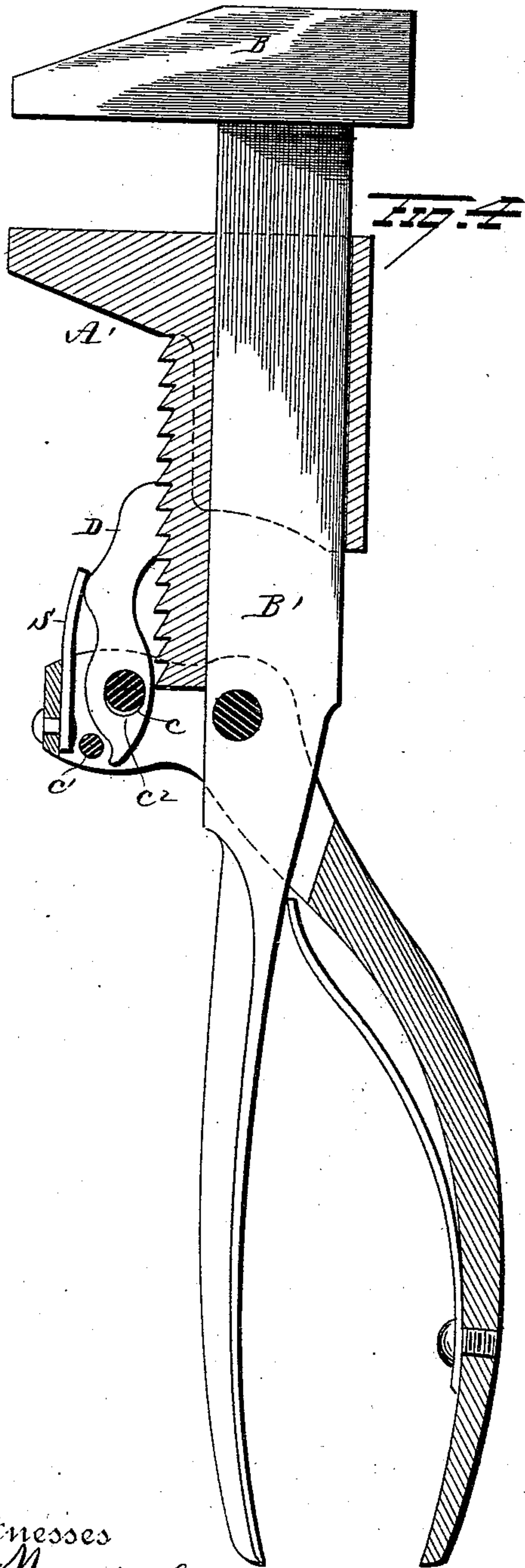
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Witnesses
E. J. Nottingham
G. J. Downing.

Inventor
Charles M. Brown.

By his Attorney
H. A. Seymour.

UNITED STATES PATENT OFFICE.

CHARLES M. BROWN, OF ROCKFORD, ILLINOIS.

ADJUSTABLE WRENCH.

SPECIFICATION forming part of Letters Patent No. 370,447, dated September 27, 1887.

Application filed June 24, 1887. Serial No. 242,413. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. BROWN, of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Adjustable Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in adjustable wrenches with sliding jaws, the object being to provide an implement of that type that will also act as pinchers or pipe-tongs and be capable of a fixed retention at any desired point within its range or capacity.

With these objects in view my invention consists in certain features of construction and combinations of parts, that will be hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation in perspective of the wrench in closed position. Fig. 2 is a side elevation in section of the device, showing the relative position of parts when the handles are spread to their extreme limit of divergent movement. Fig. 3 is a side elevation in section of the wrench, showing the parts in locked position as having rigid contact with a nut. Fig. 4 is a side elevation in section of a modified form of the combined pinchers and wrench. Fig. 5 is a view of jaws of the wrench, designed to adapt the operative mechanism shown in Fig. 1 to be used as a pipe-wrench.

B B' and C C' are pincher-handles of a length and proportionate form that will afford necessary strength. These pieces from their shape are more readily produced by casting them of a suitable metal, preferably of malleable iron or soft steel. The lower jaw, B, and its extended handle B' are integral, the jaw portion having the form of the sliding jaw of a monkey-wrench at its forward end to adapt it to engage a nut or other square surface upon which it is desired to operate. In the front portion of the lower piece, B B', a recess is produced that is rectangular in cross-section and open on the upper side from the point P, near the front face to a point, s, in the handle portion B', this recess being cut through the handle to produce an elongated slot with two integral side walls, the slot extending from

the point *m* to *m'*. (See Figs. 2 and 3.) From *m* forwardly to the face *e'* of the jaw B the lower wall of the same is made to slope till it joins the jaw proper at *t*, thus providing a strength of material that braces the jaw to resist strains incidental to its use. The bottom *h* of the recess or box just mentioned forms a right angle with the jaw-face *e'*, to produce a proper bearing for the bar A' of the sliding jaw A A'. The short integral top walls, that are made to join the side walls of jaw B at the points *p' u*, are intended to produce retaining-loops at these points to hold this sliding bar of jaw A A' in proper connection with the lower jaw, B B', as will be explained.

The upper limb, C, and its integral handle C', is slotted at the forward end, leaving two parallel side walls that extend to a point, *v*, the handle C' from *v* to *w* being channeled on its lower side, the side walls of this channeled portion being gradually diminished in vertical depth until they terminate or merge into the swelling curved handle-grip C', and it may be here stated that the handle portion B' of the lower jaw, B, is curved in a similar manner to the shape given the upper handle-piece, C', the two portions affording a convenient gripping-surface by which to grasp the device in the hand and compress or force them together.

The integral bar A' of the sliding jaw A A' is made of a proper size to fit the rectangular slot in the lower jaw, B, and has its upper surface for a portion of its length cut with ratchet-teeth *a*, these teeth sloping toward the rear end, *a'*, of the bar A', the vertical sides of the teeth being made to face toward the outer end, A, of the bar, upon which end a jaw is integrally formed to mate with the jaw B of the lower handle-piece, B'. The adjacent gripping-surface *e* of the jaw A is at right angles to the parallel top and bottom faces of the bar A'. Consequently the faces *e e'* of the jaws A B are parallel, and will so remain at any point of sliding adjustment of these jaws.

It is necessary for the proper action of the implement that the integral cross-bar *u p'* should form loops at each end of the open recess or slot in the jaw B. These are an easy fit upon the body of the bar A' and permit it to move freely endwise without undue looseness.

At the rear end of the bar A' the set-screw

F' is inserted to afford a thumb-rest by which to move the bar A' longitudinally, and thus adjust its jaws to engage objects of different thickness. The screw F' further serves to
 5 hold the sliding jaw and prevent its displacement, it being permitted to move a proper distance in the slot $m m'$, and abut against the shoulder when the proper limit is reached, which determines the maximum range of capacity of the device.

The side walls of the slotted end of the upper limb, C, are extended downwardly to produce the rounded ears F, which are adapted to fit into and have a revoluble movement in
 15 the circular notches cut in the side walls of the lower jaw, B, opposite each other, and at a proper relative distance from the face e' of this lower jaw, B, so that when placed in position the upper limb, C, will thus form
 20 knuckle-joints with jaw B B' on each side of the wrench. The proportionate length of the upper limb, C C', will afford a handle whose free rear end is about the same distance from the pivotal point F as that of the lower jaw,
 25 B B'.

Between the walls of the slotted end of the upper limb, C, near the forward end of the same, a pawl, D, is pivoted. The rivet c , that affords this connection of parts, is inserted
 30 through opposite holes in the side walls of C, and also through an elongated hole, c^2 , in the pawl D, the longest diameter of this hole resting in or near a horizontal plane that is nearly parallel to the top and bottom sides of the bar
 35 A'. The portion D' of the pawl D is serrated to have a suitable number of teeth to engage the teeth on the top surface of the bar A', these angular serrations in each piece being of the same form and of equal size, so that
 40 they will exactly mesh together. A portion of the rear end of the pawl D is cut away to leave a short projecting lug, d , remain, which is provided to form a bearing for the spring S', whose free outer end rests upon it, the other
 45 end of this spring S' being attached to the under surface of the handle C' by a set bolt or rivet, i , that is inserted into the handle near its rear end. The spring S' is of such relative strength as to cause a quick depression of the
 50 pawl when the handles C' B' are separated at their rear ends. The automatic divergence of the handles C' B' from each other to assume their normal position, as shown in Fig. 1, is effected by the flat plate-spring S, which has
 55 its free end resting to exert its full tensional strength upon the cross-bar u of the lower limb or jaw, B, which will push the handle C' upwardly, causing the ears F to roll in their socket-bearings as knuckle-joints.

60 The hook end D² is located on the upper portion of the rear or free end of the pawl D, and has an inclined or sloped edge, D³, formed on the projecting lip or hook portion, which inclined edge is made to bear upon the trans-
 65 verse cylindrical bar c' , that is riveted in place to span the space between the walls of the jaw B, into which walls this bar c' is secured.

At the rear end of the handle portion C' of the upper limb, C, two ears, r , are downwardly projected, these ears affording a means
 70 for the swinging support of the hook-bar E, which is pivoted between these ears r , and upon the squared end of this bar the spring S² is made to bear and hold the bar in the position shown in Fig. 2. The spring S² will hold
 75 the bar E in folded position by its contact with the side edge, as shown in Fig. 3. All of the plate-springs S S' S² are held in fixed position upon the under side of the handle C' of the limb C by the set-bolt i , as shown in Figs.
 80 1 and 3 of the drawings.

In operation the device is grasped in the right hand of the operator, and by holding it loosely the handle will be distended by the
 85 spring S. When the jaws are in this position, the pawl D will be elevated from contact with the bar A', and its pawl will be pushed forward by the abutment of the rod or cross-bar C' against the incline on the hook D³, which
 90 will cause the open portion of the elongated hole c^2 to lie upon the side nearest to the hook end c' .

Sliding jaw A can be moved to nearly fit upon a screw-nut or any other object it is desired to take hold of with the wrench, after
 95 which movement the handles are compressed by the hand as if they were tongs or pinchers. This will rock the upper limb, C, on its knuckle-joints, and when the teeth b of the pawl D are brought into contact with the teeth a of the
 100 sliding jaw A they will interlock perfectly with these teeth, as the end play obtained by the elongated hole c^2 will afford a limited motion of the pawl upon its supporting rivet or fulcrum c , and thus permit the teeth of the
 105 pawl to exactly bed into and register with the teeth on the slide-bar of the jaw A, so that a pinching action is given by the parallel jaws A B to grip rigidly the object placed between its jaws.

When it is desirable to hold the jaws of the wrench to grip and unloosen from an object in working with it or to successively grip several objects of the same or nearly the same size, the hook-bar E is placed as shown in Fig.
 115 2, and it then can be made to engage with its hook E' the notched integral hook f , made in the open slot f' at the extremity of the handle B', this engagement occurring when the jaws are sufficiently slackened to allow the
 120 loosening of the grip upon the object that was rigidly held, but prevents such distension of the handles C' B' as would allow the jaw A to clear the teeth of the pawl D. An inspection of Fig. 2 will exhibit this important feature
 125 of construction. It will be seen that the pivotal point of the two limbs C' B' is in the bosses or rounded ears F, and that the length of the depending arms, of which they form the extremities, is such a distance below the pivot c
 130 of the pawl D as to give a leverage to the upper limb, C, which is thus converted into a powerful compound lever by the engagement of the teeth of the pawl with the bar A', so that

a limited movement that separates slightly the previously more closely adjusted handles C' B' will project forwardly the sliding jaw A by the rocking action of the arms F' and release its hold upon the object grasped.

When it is of advantage to hold the jaws in rigid contact with an object placed between them—in fact, to convert the pinchers into a hand-vise—this can be accomplished by simply squeezing or forcing the limbs C' B' as close as may be by the grasp of the operator, and then causing a tooth of the ratchet-bar E to engage the hooked shoulder f of the handle B'. This will securely lock the nut or other article that is gripped between the parallel jaws A B.

This implement may be modified in the form of its jaws to answer as a pipe-wrench, which adaptation is exhibited in Fig. 5, and it is apparent that it will operate fully as well for such a purpose as the use previously indicated. The ability to grip and release or change the position of the gripping-jaws are particularly available features for such a use, and renders the tool very convenient for operating upon pipes that are to be placed in a corner or other difficult location.

As a hand-vise to hold small work while filing it into shape, the tool will commend itself to mechanics of metal-working trades, and, in fact, from its peculiarities of construction and manner of operation, it is a compact, durable, and available tool for many purposes other than those herein mentioned.

In Fig. 4 a modified form of the gripping-wrench is shown. In this form of the wrench the sliding jaw A' is made to move or slide upon the outside of the shank B B', there being a reversal of the limbs in position, and their form is somewhat changed to adapt them to such a change of relative position. The operation of the pawl is similar in both devices, and the gripping is effected by substantially similar methods of construction of the pawl D, spring S, elongated hole c², fulcrum bolt or rivet c, and transverse bar c', that engages an incline on the rear of the pawl D.

Other slight changes might be made in the constructive details of this device without a departure from the spirit of my invention; hence I do not wish to limit myself to the exact forms and combinations of parts herein shown; but,

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

1. In a wrench, the combination, with a handle or limb having a rigid jaw and a movable jaw carried by said handle or limb, of a second handle or limb pivoted to the first-mentioned handle or limb and provided with a pivoted pawl adapted to engage the

shank of the movable jaw, substantially as set forth.

2. The combination, with two limbs hinged together by knuckle-joints formed in parallel side walls, one limb having a jaw, of a sliding jaw adapted to move toward or from the other jaw and be held in contact with an object placed between the jaws, substantially as set forth.

3. The combination, with two limbs hinged or pivoted together, one limb being provided with a fixed jaw, of a sliding jaw, a pawl having an elongated hole made transversely through its body and pivoted to one of said limbs, and springs to operate the pawl and spread the handles or limbs of the wrench, substantially as set forth.

4. The combination, with two limbs hinged together by opposite knuckle-joints, one limb having a fixed jaw that has a longitudinal recess in it adapted to receive a sliding jaw, of a sliding jaw provided with ratchet-teeth, a pivoted pawl, an elongated hole through which its pivot-pin passes, and springs to operate the pawl and spread the handles of the wrench apart, substantially as set forth.

5. The combination, with two limbs, a pivoted connection, and a ratchet-toothed dog or pawl pivoted to one limb, so as to have a limited longitudinal movement on its pivot-joint, of a sliding jaw having ratchet-teeth cut in it adjacent to the toothed surface of the pawl and adapted to be engaged by the pawl when the handles or limbs are compressed toward each other, substantially as set forth.

6. The combination, with two hinged limbs, one having a jaw, a sliding jaw that moves longitudinally between these hinged limbs, and having ratchet-teeth on its surface, of a pawl pivoted at one end to one of said limbs, so as to move slightly endwise on its pivot-bolt, and provided with one or more teeth to mesh with the adjacent ratchet-teeth of the sliding jaw, a spring to move the pawl toward the ratchet-teeth of the sliding jaw, and a spring to cause the limbs to spread apart, substantially as set forth.

7. The combination, with two pivoted limbs, one having a jaw, and a sliding jaw having ratchet-teeth, of a pawl pivoted to one limb and adapted to move endwise slightly when it engages the ratchet-teeth of the sliding jaw, a spring to operate the pawl, a spring to part the limbs, and a hook-bar to hold the limbs together, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES M. BROWN.

Witnesses:

DAVID N. STARR,
F. S. REGAN.