

(Model.)

G. W. PITTMAN.  
WRENCH.

No. 286,842.

Patented Oct. 16, 1883.

Fig. 1.

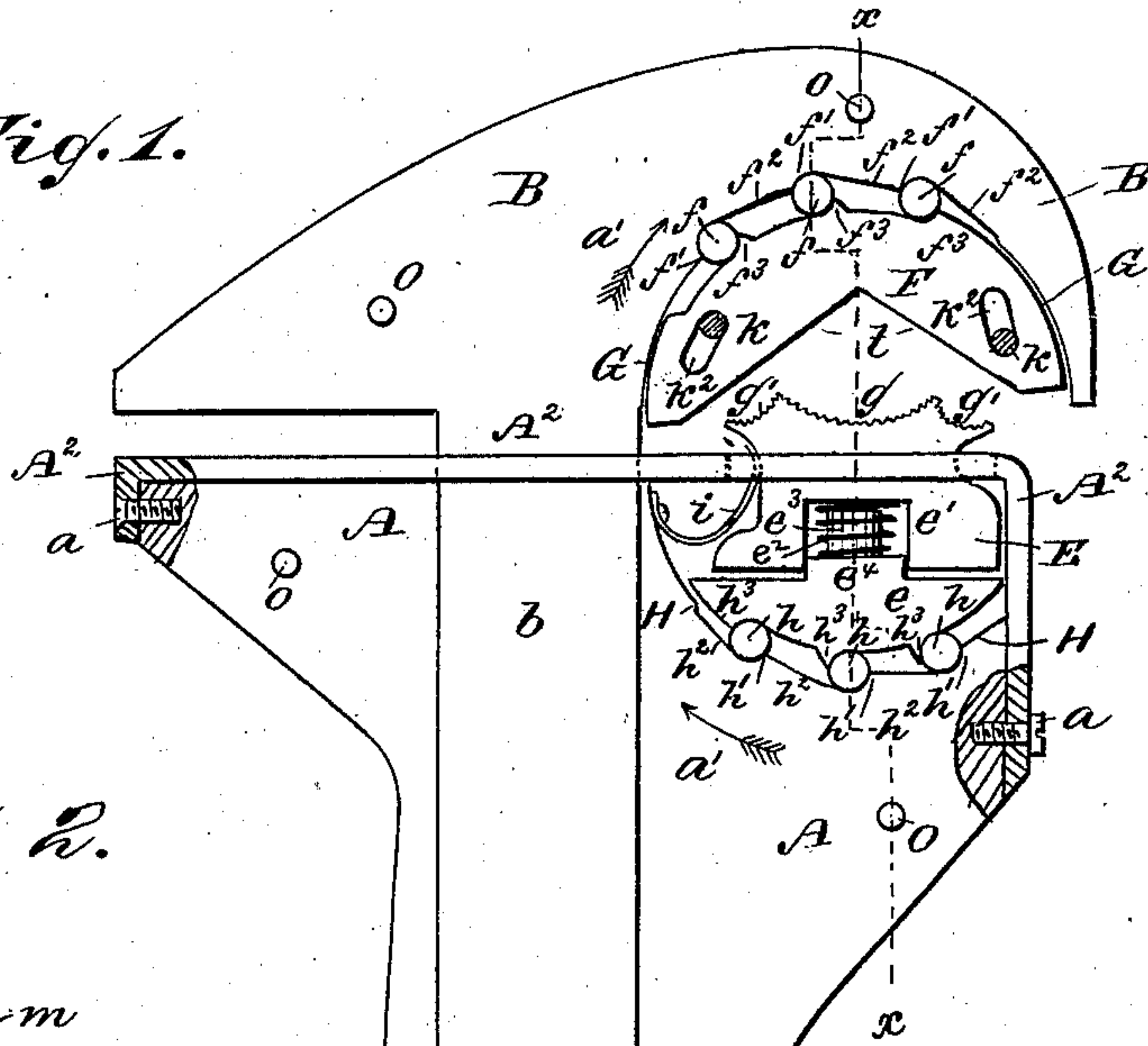


Fig. 2.

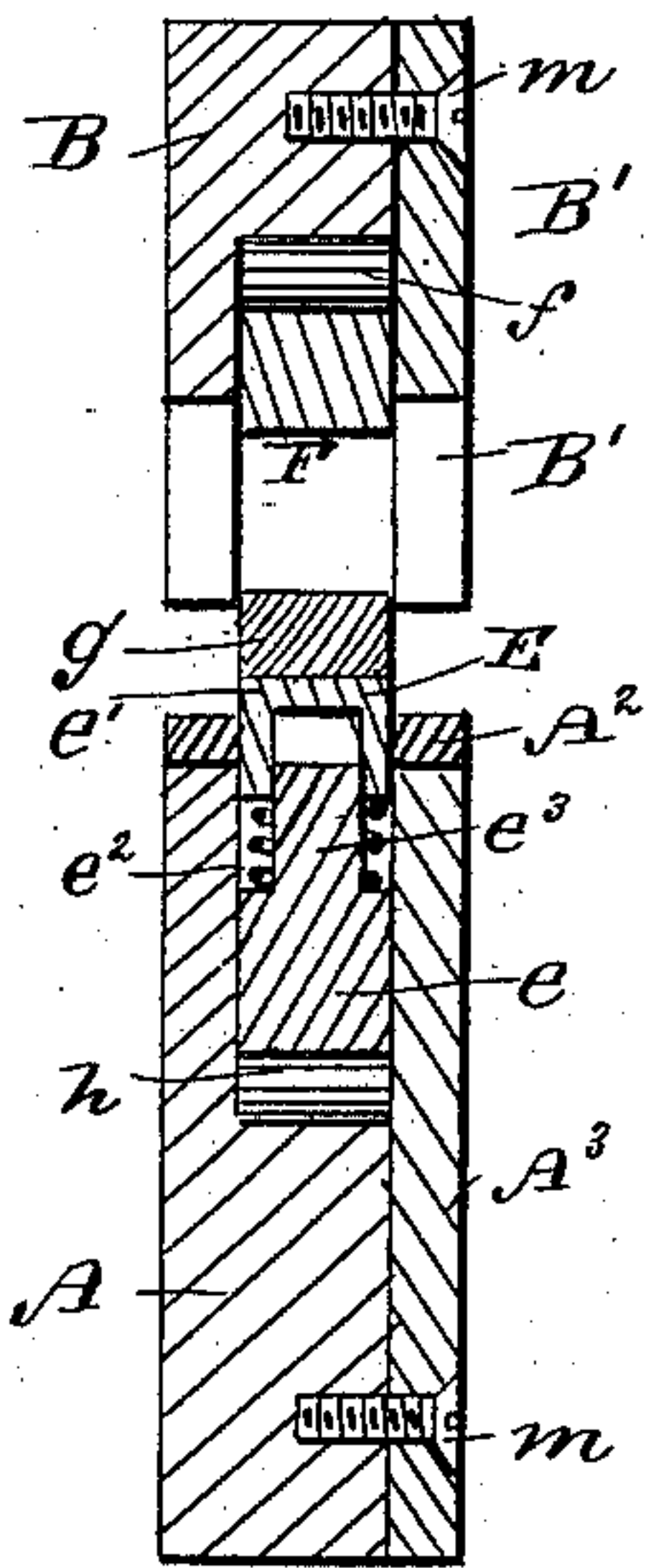
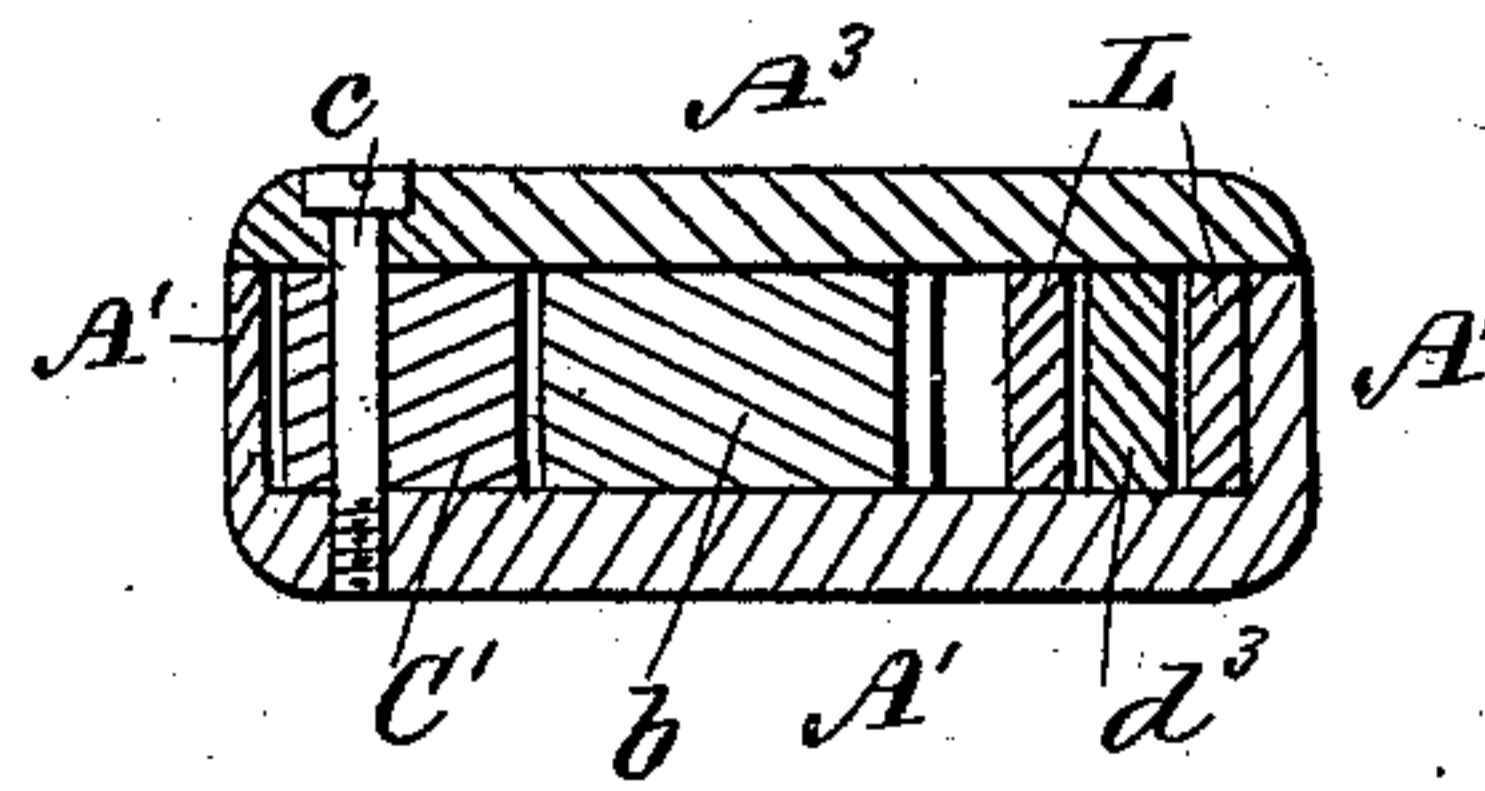


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## WRENCH.

SPECIFICATION forming part of Letters Patent No. 286,842, dated October 16, 1883.

Application filed January 20, 1883. (Model.)

*To all whom it may concern:*

Be it known that I, GRANVILLE W. PITTMAN, of Keokuk, in the county of Lee and State of Iowa, have invented a new and Improved Wrench, of which the following is a full, clear, and exact description.

This invention relates to a wrench of improved construction adapted to all the uses of ordinary wrenches, combining a grip or hold for both flat and round objects.

The invention consists in a wrench having a stock or handle recessed centrally to receive the shank of the movable jaw, and also at its end for the reception of grip devices for holding the movable jaw, said devices consisting of a pivoted lever having a cam-head to grip one edge of the shank, and acting by its free end upon an angle-lever carrying ratchet-teeth for engagement with serrations of the opposite edge of the shank, the long arm of the angle-lever also working a pawl-block fitted to engage with or disengage from the serrations of the shank simultaneously with the ratchet-teeth on the long arm of the angle-lever, whereby the movable jaw will be held against undue slip when under strain.

The invention includes, also, a system of movable grip-blocks or bits in either the fixed or movable jaw or both jaws of the wrench, for hold upon round objects, these bits working by rollers upon inclines tangent to the seats of the blocks in the jaws of the wrench, whereby any slip of the shank of the movable jaw from its lower cam and ratchet-grip connections in the handle will be compensated for by the movement of the bit-blocks when holding round objects, and for holding the latter more securely.

The invention includes, also, special constructions of parts of the wrench and combinations of the parts thereof, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly-sectional side view of my improved wrench with the side cap-plates removed. Fig. 2 is a sectional elevation on the line *x x*, Fig. 1; and Fig. 3 is a cross-section on line *y y*, Fig. 1.

A' represents the handle-stock of the wrench, recessed longitudinally to receive by a sliding fit the shank *b* of the upper movable jaw, B, for action with the lower jaw or jaws, A, formed at the head of the stock in gripping flat or round objects. The movable jaw B is held against undue slip when under strain of use by lever, cam, and ratchet devices acting in the end of stock A' upon the end of shank *b*, such devices consisting of a hand-grasp lever, C, pivoted at *c* in its cam-shaped head C', and acting by its lower end or heel, preferably fitted with a friction-roller, *c'*, upon the lower short arm, *d'*, of an angle-lever, D, pivoted at *d*; and the longer arm *d''* of the lever has formed at its head and inner face the teeth or serrations *d'''*, to engage the teeth or notches *b'*, formed upon the edge of shank *b*. A pawl-block or dog, L, is loosely fitted to turn in a curved recess, *l'*, of the stock A', and carries one or more teeth, *l*, also adapted to engage with notches *b'*. The dog L is preferably forked over the head of arm *d''* of lever *d*, but may otherwise connect with lever D, for operation thereby. A coil or other spring, D', is suitably held between the angle-lever and the stock, to thrust hand-grasp C outward and disengage the teeth *d'''* *l* from the teeth *b'* of shank *b*. I prefer to cut away the shanks *b* at the edge opposite teeth *b'* at *b''*, to avoid overwidening of the stock-handle, while accommodating the cam C' therein, and to form a suitable grip-face for said cam, and a projection or stud, *b'''*, to prevent disconnection of jaw B from the stock, when the wrench is held head downward, by contact of stud *b'''* with cam-head C'.

I employ the gripping devices above described for tightening upon and holding the work whether the jaws A B are fitted for a square grip only or for a round grip only, or for both square and round grips, which latter construction is shown in the drawings; and in any case the head or jaw B will be moved freely in the stock to clasp the work, when, on applying power to the handle end of the stock, the projecting hand-grasp lever C will be forced inward to close its cam-head C' against one edge of the shank *b*, and simultaneously therewith engage teeth *d'''* *l* with the teeth *b'* at the opposite edge of the shank, thus gripping it to hold jaw B to the work without



undue slip, the grip of the cam, lever-teeth, and dog upon the shank increasing with the power of the grasp upon and force applied to the lever C, which, when released by the thumb and finger, will permit spring D' to promptly disengage the grip devices from the shank to release the jaw B; or the gripping devices may be released by the action of spring D'.

The construction of the above-described grip devices, while affording a firm hold, permits a very slight slip of the upper jaw, B, which is at times preferred in operation upon flat work by a square grip; but in gripping round work such slip is objectionable, and to obviate this, and also to secure advantages of tighter grip inherent in themselves, I fit the self-adjusting bits E F in the jaws A B, respectively, the jaw A being covered at its working-face on the square-grip side by a plate of steel, A<sup>2</sup>, slotted suitably for passage therethrough of shank b and the head of bit E at the round-grip side, which plate A<sup>2</sup> covers, also, the top edge of the removable side casing, A<sup>3</sup>, of the wrench, as in Fig. 2, and extends down both ends of the jaw or jaws A, to be fastened thereat by screws a a, Fig. 1. In this example I make the bit E in two parts—a base, e, and a head, e'—interposing between them a suitable spring, e<sup>2</sup>, here shown positioned upon a pin, e<sup>3</sup>, of base e, for holding head e' slightly raised above base e, to yield under pressure before resting squarely on the base, the pin e<sup>3</sup> of which may enter head e', to act with a shoulder, e<sup>4</sup>, within the central recess of the head, to cause a spring, i, fixed at one end to stock A', to thrust the entire bit E, head and base together, outward toward the end of the jaw. The head e' may have a central concave gripping-surface, g, and smaller concave gripping-surfaces g' at either side, for holding large and small rounds, respectively, with the movable jaw B.

The seat H in the stock, on which the bit E and the friction-rollers rest, has the general form of the arc of a circle, struck, preferably, from a vertical line passing through the center of bit E when in its normal forward position, or from a point on the section-line x x, Fig. 1.

I propose to give the bit E, while holding and under strain and as it rises on its seat H in the direction of arrows a', a forward movement toward the movable jaw B, (or its bit F when used,) to compensate for slip of jaw B and for tighter grip; and to accomplish this I may form inclines at a few points on seat H, rising in the direction of arrow a', and interpose friction-rollers h between the arc lower face of base e and seat H, to be driven up the tangential or curved inclines h<sup>2</sup>, formed in or upon the seat H, and rising in direction of arrow a', so that as the bit E moves in such direction and against the tension of spring i its grip-faces g g' will advance slightly toward jaw B or its bit F, the shoulders h<sup>3</sup> of base e and the shoulders h' at the base of inclines h<sup>2</sup> re-

turning with rollers h to their normal position of Fig. 1 when the grip is released, and the shoulders h<sup>3</sup> drawing away from the rollers and the rollers from shoulders h' when the strain is applied, leaving the rollers free to turn when moving up inclines h<sup>2</sup> with minimum friction.

The movable bit E in the fixed jaw may alone be used to coact with an angular grip-face of the movable jaw B; but to make the round hold more certain I fit the bit F, preferably having angular face t, in jaw B, to be advanced toward bit E by inclines f<sup>2</sup> of its seat G, using friction-rollers f, normally resting between shoulders f' and f<sup>3</sup>, respectively, of the jaw and bit, for projecting bit F in substantially similar manner as bit E is moved when at work, the bit F being held to jaw B by pins k, passing through slots k<sup>2</sup> of the bit, and fitted snugly in holes in the side and cover plates of the jaw.

In using the wrench for round holds, the lower shank-gripping devices being disengaged, as in Fig. 1, the movable jaw B is withdrawn sufficiently to clasp the round pipe-bar or other object between the bits E F, the jaw B being then forced down (when the two-part bit E is used) hard enough to compress spring e<sup>2</sup> and seat head e' squarely on base e, the resistance of the spring serving to compress the bit E on the object firmly enough to prevent a movement of the bit up the inclines of seat H until after the compression of grasp-lever C has secured the shank b of jaw B to prevent its undue slip, as above described, whereupon, on turning the wrench-handle in the direction of its arrow a<sup>2</sup>, the bit E (and F also when the latter is used) will move in the direction of arrows a', causing one or both bits to be tightened on the work by movement up or along the inclines with a force proportionately increasing with the power applied.

As above intimated, the wrench may be made with either squared or round grip-jaws alone, and with square grip-jaws only, making in the latter case a substantial, easily-worked, and low-priced tool; and either one or both of the bits E F (the former in either solid or two-part construction) may be used in the round grip-jaws, as desired.

The outside face-plates, B', of the upper jaw and A<sup>3</sup> of the lower jaw and stock are attached, preferably by screws m, in apertures o, to permit easy removal of the plates for access to the parts, and the range of movement of jaw B may be varied by lengthening the levers C D; but in practice sufficient movement of jaw B will be had with lever C, proportioned for convenient and firm grasp of the hand.

Thus constructed, it is believed that my improved wrench has advantages over other tools of this class in its quick adjustment and certain hold on rounds, increasing with the power applied, and the wrench may be made cheaply, is well calculated for durability, and will be found useful in a wide range of work.



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

1. The combination, with the toothed shank  
5 of the movable jaw of a wrench adapted to slide in the stock, of a pivoted hand-grasp lever, and an angle-lever pivoted in the stock and provided with teeth  $d^3$ , substantially as described, and for the purpose set forth.
- 10 2. The combination, with the handle-stock  $A'$  and the sliding shank  $b$  of the movable jaw, of the pivoted hand-grasp lever  $C$ , having cam-head  $C'$ , and the pivoted angle-lever  $D$ , having teeth  $d^3$ , for engaging teeth  $b'$  of the shank  
15  $b$ , substantially as shown and described.
3. The combination, with the handle-stock  $A'$  and the toothed sliding shank  $b$  of the movable jaw, of the pivoted hand-grasp lever  $C$ , having cam-head  $C'$ , angle-lever  $D$ , pivoted in  
20 the stock, and having teeth  $d^3$ , and spring  $D'$ , substantially as described, and for the purpose set forth.
4. The combination, with the handle-stock  $A'$  and the toothed sliding shank  $b$  of the movable jaw, of the pivoted hand-grasp lever  $C$ ,  
25 having cam-head  $C'$ , angle-lever  $D$ , pivoted in the stock, and having teeth  $d^3$ , spring  $D'$ , and pawl-block  $L$ , substantially as described, and for the purpose set forth.
- 30 5. The combination, with the toothed shank  $b$  of the sliding jaw and the stock  $A'$  of the stationary jaw, of the pawl block  $L$ , fitted loosely in a recess in the stock and forked over the head of the angle-lever  $D$ , substan-

tially as described, and for the purpose set forth. 35

6. The combination, with the loose round-hold bit of a wrench-jaw, of friction-rollers mounted on inclines of the bit-seat, substantially as herein shown and described. 40

7. The combination, with a wrench-jaw, of a bit,  $E$ , made in two parts,  $e e'$ , adapted to seat firmly upon each other, and having the interposed spring  $e^2$ , substantially as shown and described. 45

8. The combination, with the fixed jaw of a wrench, of a movable bit,  $E$ , for round holds, and the guide and cover-plates  $A^2 A^3$ , substantially as shown and described.

9. The combination, with the movable jaw  
50 of a wrench, of the bit  $F$ , held on pins  $k$  and adapted to move on inclines of its seat, and rollers, substantially as shown and described.

10. The combination, with the jaw  $B$  and its bit  $F$  and rollers  $f$ , of the cover-plate  $B'$ ,  
55 substantially as shown and described.

11. The combination, with the jaws of a wrench, of two oppositely-placed round-hold bits,  $E F$ , and friction-rollers mounted on inclines in the bit-seats, substantially as described, and for the purpose set forth. 60

12. The combination, with the gripping devices  $C D D' E$ , of the cover-plate  $A^3$ , substantially as shown and described.

GRANVILLE WARREN PITTMAN.

Witnesses:

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