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F. G. CORNELL.

WRENCH.

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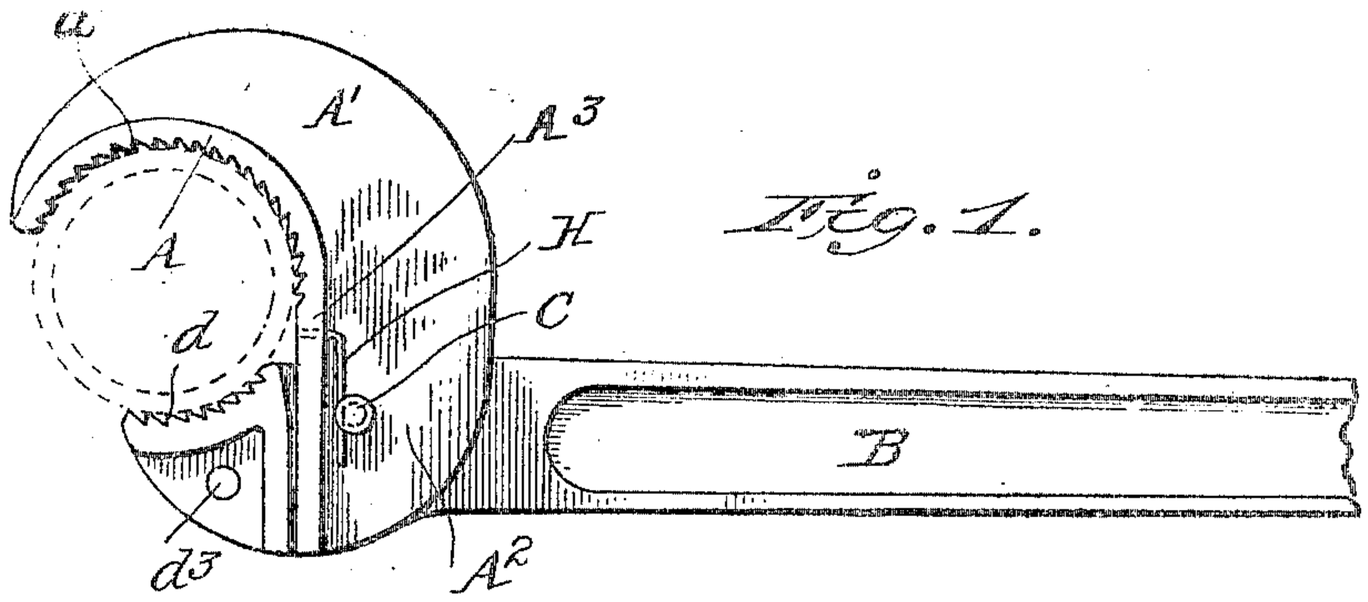


Fig. 1.

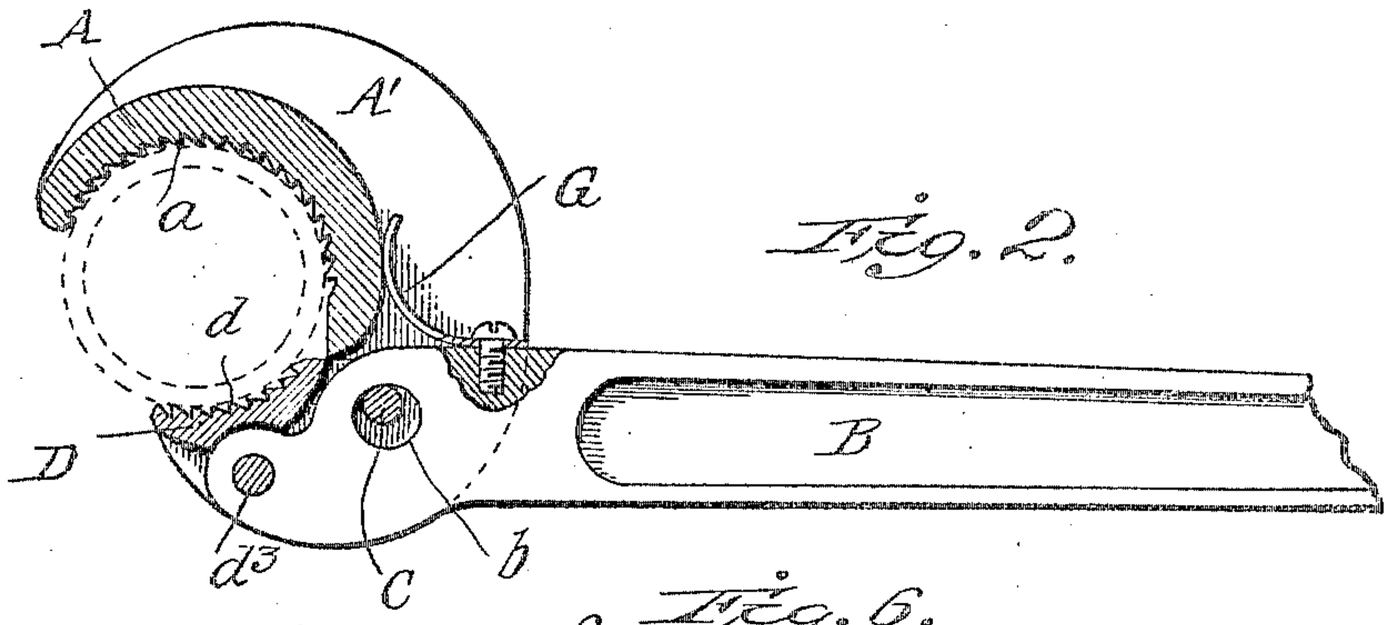


Fig. 2.

Fig. 3.

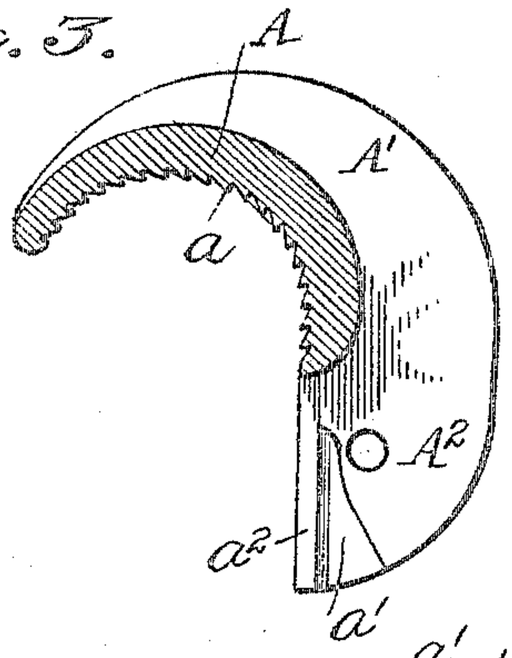


Fig. 6.

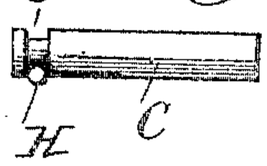


Fig. 4.

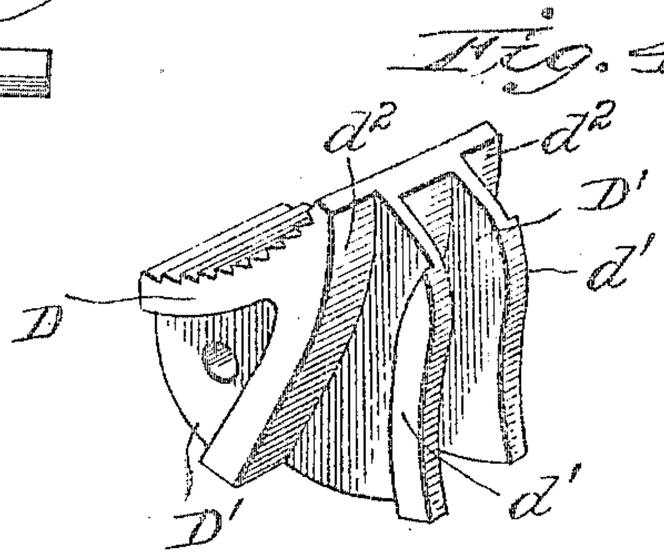
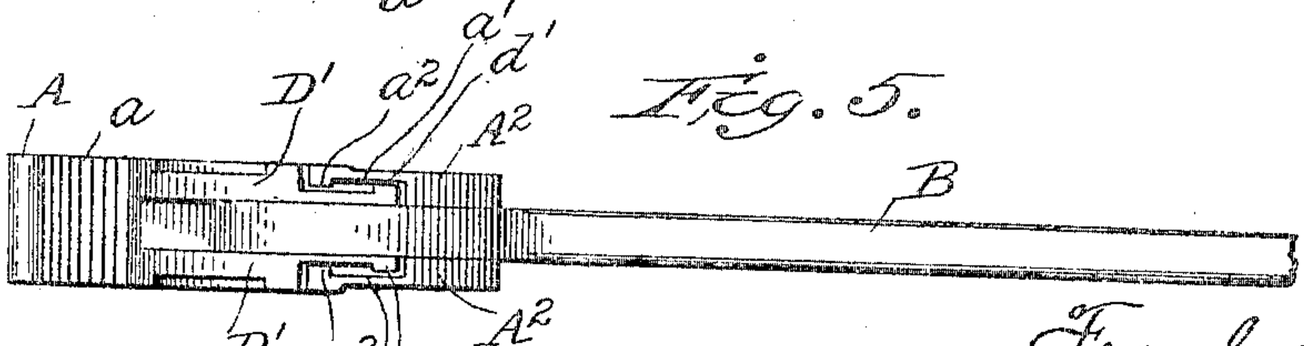


Fig. 5.



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WRENCH.

No. 797,662. Specification of Letters Patent. Patented Aug. 22, 1905.

Application filed January 18, 1905. Serial No. 241,669.

To all whom it may concern:

Be it known that I, FRANK G. CORNELL, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in wrenches primarily adapted for grasping and turning pipe or substantially cylindrical objects, although features of the invention are applicable to wrenches designed for other purposes, but involving the employment of grasping-jaws adapted to be moved relatively to each other to effect the gripping of the article being operated on.

The objects of the invention are to provide an exceedingly simple and durable wrench the parts of which may consist of simple castings adapted to be assembled with little or no finishing or machine-work.

A further object of the invention is to provide a wrench in which the jaws will be so connected as to be properly positioned with relation to each other and at the same time permit of necessary relatively pivotal movements to conform to the article being grasped when moved by the operating-handle to effect the gripping.

Primarily the invention consists in a wrench having jaws movably connected, so as to be capable of a pivotal action with relation to each other, and an operating-handle pivotally connected with both jaws and adapted to move them with relation to each other to grip the article being operated on.

The invention further consists in a wrench embodying a gripping-jaw having integral cheeks between which the handle is pivotally mounted, said cheek-pieces being extended around the gripping-face of the jaw to form strengthening-ribs.

The invention further consists in certain novel details of construction, combinations, and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a side elevation of a wrench embodying the present improvements. Fig. 2 is a similar view, partly in section. Fig. 3 is a sectional view through main jaw. Fig. 4 is a perspective view of the smaller or supplemental jaw. Fig. 5 is an edge elevation of the wrench. Fig. 6 is a detail of the pivot-pin and its retainer.

Similar letters in the several figures indicate like parts.

The type of wrench adopted for illustrating the present invention is one wherein the jaws are designed for gripping a pipe—for instance, of standard size or such variations of the size as usually occur in the commercial product or a pipe and the commercial coupling designed for the pipe—and interchangeable jaws are provided for adapting the wrench for other standard sizes of pipe, although it will be understood that the invention is not necessarily limited to this type of wrench, as features of the invention may be used in connection with wrenches wherein the relative jaw movement is sufficient to accommodate pipe or other articles of widely-differing diameters.

Referring to the said drawings, the letter A indicates the main jaw of the wrench, and in the particular type illustrated it takes the form of a hook the inner or concave face of which is toothed, as at *a*, while extending around the outer or convex face are a pair of flanges A′, which gradually increase in width from the nose of the hook and are extended in the form of cheeks A^2, between which the end of the operating-handle B passes. The operating-handle passes between the cheeks A^2 and is pivotally connected therewith by a pin C, said pin being preferably mounted in the cheeks to bridge the opening between them, and the opening *b* in the handle for the reception of the pin is of considerably larger diameter than the pin itself, as shown clearly in Fig. 2, in order to equalize the gripping pressure of the jaws and afford a certain play or looseness to insure the correct positioning and operation of the jaws.

The shorter arm of the operating-handle projects beyond the cheeks and is pivotally connected by a pin d^3 with the smaller or supplemental jaw D, which latter has a concaved toothed face *d* opposed to the toothed face of the main jaw. This smaller or supplemental jaw is to a certain extent similar in construc-

tion to that of the main jaw—that is to say, it is formed with two flanges D′ on its rear face, which flanges receive the end of the operating-handle between them where it is pivotally connected by said pin d^3, and in addition said flanges extend back of the pivot-pin and take a bearing on the edges of the cheeks at each side of the handle and through suitable projections and recesses, to be now described, are movably connected with the cheeks of the main jaw, so as to have a pivotal action with relation thereto.

In the preferred construction and as illustrated the flanges D′ pass between the cheeks of the main jaw on each side of the handle, and along the inner edges on the outer sides they have ribs d', curved, as shown, and adapted to work in recesses a' in the cheeks, said recesses preferably having straightforward sides parallel with the edges of the cheek at a^2 and inner edges curved to conform to the curvature of the ribs d'. The construction is such that the edge beads a^2 guide the supplemental jaw by being confined somewhat loosely in the narrower part of the space between the bearing portions d^2 of the flanges D′ and the ribs d', and at the same time the said jaws are capable of a pivotal action with relation to each other, and this pivotal action takes place when the jaws are moved toward and from each other by the operating-handle and is sufficient in extent to permit the jaws to conform accurately to the surface of the object being grasped and to bring the line of maximum pressure always central of the jaw.

The effect of providing a journal in the handle larger than the pivot-pin is to cause the handle to travel back on a curved line with relation to the pivot as the jaws are drawn together and their approach resisted, thus shortening the power end of the lever slightly and causing it to act with greater power. It also tends to draw the supplemental jaws inwardly and prevents any possibility of the parts binding or stretching even under excessive strains.

To make the wrench automatic in its action, a spring G may be provided on the handle to advance the main jaw toward the supplemental jaw, and in use the pressure of the pipe on the main jaw will flex the spring and allow the pipe to enter readily; but at the same time the jaws will be at once closed on the pipe, and an advance movement of the handle causes an instantaneous grip without danger of slipping or crushing the pipe.

Inasmuch as the type of wrench contemplates the use of several sizes of main jaws the pivot-pin is preferably made readily removable, for which purpose it is provided with an annular recess c for the reception of a spring-retainer, which may be a simple spring-wire H, having one end held in one of the side beads A^3 of the main jaw and located in position to enter the recess in the pin when the latter is properly seated. Simple pressure on the retainer at once releases the pin, and at the same time the said retainer is located between the pin and bead A^3 and close to the latter, where it is protected against injury through contact with objects against which the wrench may strike.

The construction of jaw with two strengthening-flanges extended to form cheeks between which the handle is held not only provides the strongest possible structure with the use of the least possible metal, but it is a structure which may be readily cast in one piece and is of such form that no machining or finishing is necessary before assembling the parts. Said flanges and cheek-pieces practically form a casing between which all the working parts are located, so that there is little danger of injury through the rough usage to which articles of this nature are subjected.

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

1. A wrench embodying a pair of gripping-jaws having coöperating projections for movably and pivotally connecting said jaws and an operating-handle pivotally connected with said jaws at different points to operate as a lever in moving the jaws toward and from each other; substantially as described.

2. A wrench embodying a pair of gripping-jaws having overlapping flanges pivotally and movably connected and an operating-handle pivotally connected with said jaws at different points to operate as a lever in moving the jaws toward and from each other; substantially as described.

3. A wrench embodying a main gripping-jaw having parallel flanges on its outer face extended to form parallel cheeks at one end of the jaw, a lever-handle pivotally mounted between said cheeks and a supplemental jaw pivotally mounted on said handle and coöperating with said cheek-pieces to be guided thereby toward and from the main jaw; substantially as described.

4. A wrench embodying a main gripping-jaw having extended parallel cheek-pieces, a supplemental jaw movably and pivotally mounted so as to slide bodily on said cheek-pieces and an operating-handle pivotally mounted between the cheek-pieces and pivotally connected with the supplemental jaw at a point beyond the cheek-pieces; substantially as described.

5. A wrench embodying two gripping-jaws movable toward and from each other and having coöperating flanges, pivot-pins in said flanges and an operating-handle having openings for said pins, one of said openings being circular and of greater diameter than the pin to provide a loose pivotal connection; substantially as described.

6. A wrench embodying two gripping-jaws

movable toward and from each other and having interlocking flanges for guiding the jaws with relation to each other, an operating-handle pivotally connected with the jaws at different points, the pivotal connection between said handle and one jaw embodying a pivot-pin and a relatively large circular bearing in which said pin works to afford a loose pivotal connection; substantially as described.

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