

(No Model.)

G. GUNNARSON.

THREE GRIPPED SELF ADJUSTING PIPE WRENCH.

No. 460,230.

Patented Sept. 29, 1891.

Fig. 1.

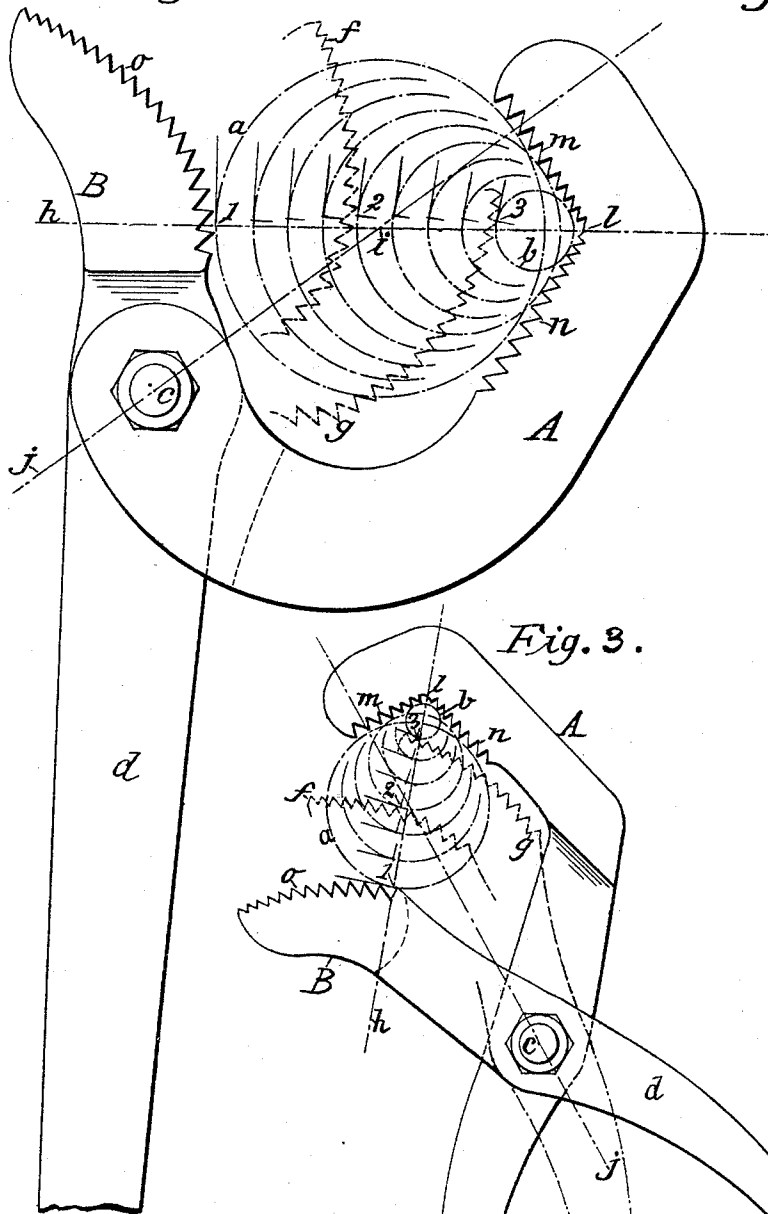


Fig. 2.

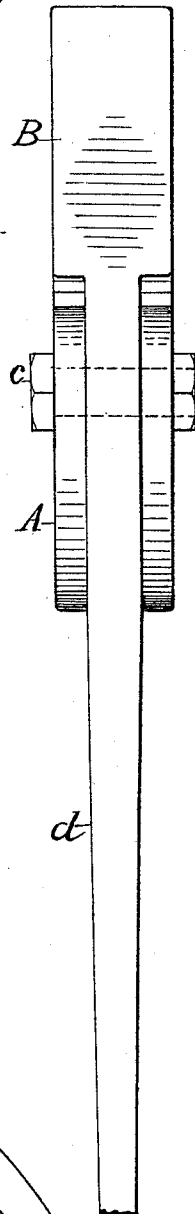
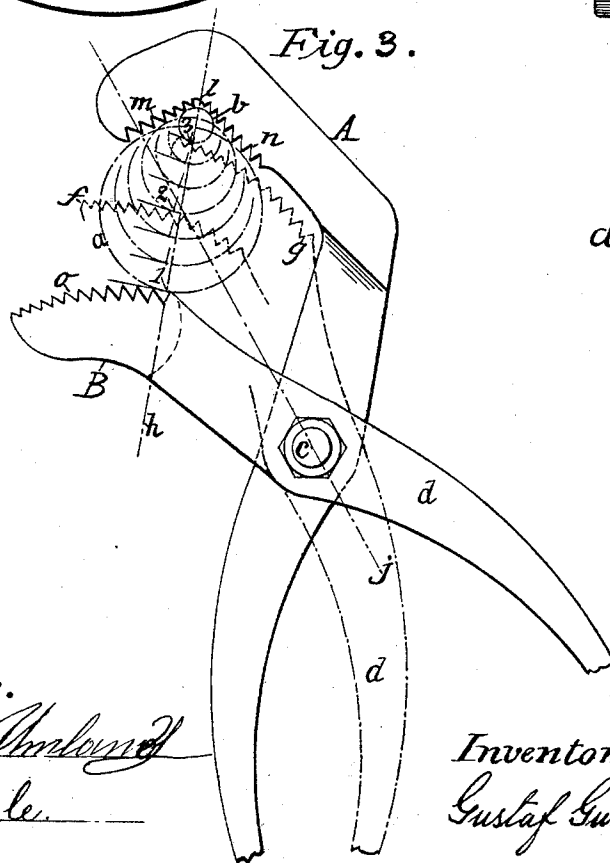


Fig. 3.



Witnesses.

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GUSTAF GUNNARSON, OF SAN FRANCISCO, CALIFORNIA.

THREE-GRIPPED SELF-ADJUSTING PIPE-WRENCH.

SPECIFICATION forming part of Letters Patent No. 460,230, dated September 29, 1891.

Application filed September 18, 1890. Serial No. 365,444. (No model.)

To all whom it may concern:

Be it known that I, GUSTAF GUNNARSON, a citizen of the United States, residing at the city and county of San Francisco, State of California, have invented a new and useful Three-Gripped Self-Adjusting Pipe-Wrench, of which the following is a specification.

My invention relates to improvements in pipe-wrenches; and the objects of my improvements are, first, to provide a self-adjusting wrench that can be shifted instantly from one size of pipe to another and still afford a similar grip for small or large pipes, at the same time being very simple and strong; second, to provide a wrench that will grasp the pipe on three different sides with series of teeth graduated in size to the size of pipe they are bound to work upon, thereby affording a very strong hold and preventing the pipe from being crushed or flattened under hard screwing. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the wrench, handle excluded, showing the principle of construction and its working. Fig. 2 is an edge view of the wrench in Fig. 1. Fig. 3 is a side view of pliers or tongs constructed on exactly the same principle as Fig. 1 and referring to the same description. The object is to provide a tool that can be worked with one hand.

Similar letters refer to similar parts throughout the several views.

The C-formed jaw A is provided with two series of teeth *m* and *n* at an angle to each other *m l n* which is determined by the leverage *c l* of the jaw B, as hereinafter stated, and is calculated to grip the pipe on two sides equally distant and opposite the grip of jaw B. The teeth are decreased in size toward the corner *l* in proportion with the pipes they work upon. The jaw is farther extended to pivot *c* in a curved shape, in order to give room for jaw B when brought up close together. Its joining end is split and divided, so as to receive and hinge to the jaw B by means of a bolt or pivot *c*, or simply bolted one across the other, as in Fig. 3.

The self-adjusting jaw B, which is extended as a lever *d*, forming the handle of the wrench, is provided with a toothed curve *o*, gradually rising from the pivot *c* in such shape that

when it is brought against any size of pipe that can be held by the jaw A it will grasp any pipe at the same angle of leverage *c i l* 55 from a line drawn through the pivot *c* to the center of each pipe. This curved shape of jaw B is obtained by combining the tangents to all the circles *a b* and intermediate at the respective points 1 2 3 and intermediates 60 found by laying off the angle of leverage *c i l* on each circle from a line running through pivot *c* to center of each circle. The teeth decrease in size toward the end of the jaw proportionally with the pipes they act upon. 65

Two different positions of the jaw B against the pipes are shown by the dotted lines *f* and *g*. As light pipe or tubing affords less resistance to pressure, it requires a wrench built on larger angle, (longer leverage,) which divides the pressure more evenly around the pipe, but which has not so powerful grip as if the angle be smaller or the leverage shorter. I therefore do not confine my invention to any certain degree of angle or leverage, although 75 thirty-five degrees angle, as shown in Fig. 1, has given good results for ordinary pipe-work.

When planning a wrench, I first draw the largest circle *a*, and across its center draw the dotted line *j*, on which I lay the pivot *c*, as shown in Figs. 1 and 3, in the latter figure at a distance from the pipes that will give a moderate motion to the shanks. Then I mark off the desired angle of leverage *c i l* from point 1. I draw the line *h* across center of 85 circle *a* and lay the toothed side *m* of jaw A square across the line *j*, close to the circle *a*. The other toothed side *n* is laid in a corresponding position on the opposite side of line *h*, which line is indicating the corner *l* of this 90 jaw. I then draw all the different circles on the line *h*, all close to jaw A, marking off their angle of leverage 1 2 3, &c., and the corresponding tangents, as shown, and lay off the jaw B on a separate piece of tracing-paper 95 fastened rotary on the pivot *c*, so it can be swung up to all the circles, commencing on the largest, and their tangents be marked off, forming the bend *o* of the jaw B.

In using this wrench the workman only has 100 to close the jaws tight around the pipe with one hand while he pulls the handle with the other in the direction indicated by the teeth.

Thus described, what I claim as my inven-

tion, and desire to secure by Letters Patent, is—

1. In a self-adjusting wrench, pliers and
tongs for screwing pipes and fittings, the com-
5 bination of a jaw A, having two series of gradu-
ated teeth *m* and *n* at an angle to each other,
m l n determined by the angle of leverage *c*
i l for gripping the pipes on two sides equally
10 opposite the grip of jaw B, with which jaw it
is hinged by the bolt *c*, all substantially as set
forth.

2. The combination, in a wrench, pliers, and
tongs for screwing pipes and fittings, &c., of

a self-adjusting jaw B, extended as a lever and
having a curved series of graduated teeth *o*, 15
constructed after the angle of leverage *c i l*,
which may be varied according to purpose, the
jaw gripping the various pipes at this same
angle and directly opposite the two grips of
jaw A, with which it is hinged by the pivot *c*, 20
all substantially as shown, for the purpose
specified.

GUSTAF GUNNARSON.

Witnesses:

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BENJIE B. HASKELL.