

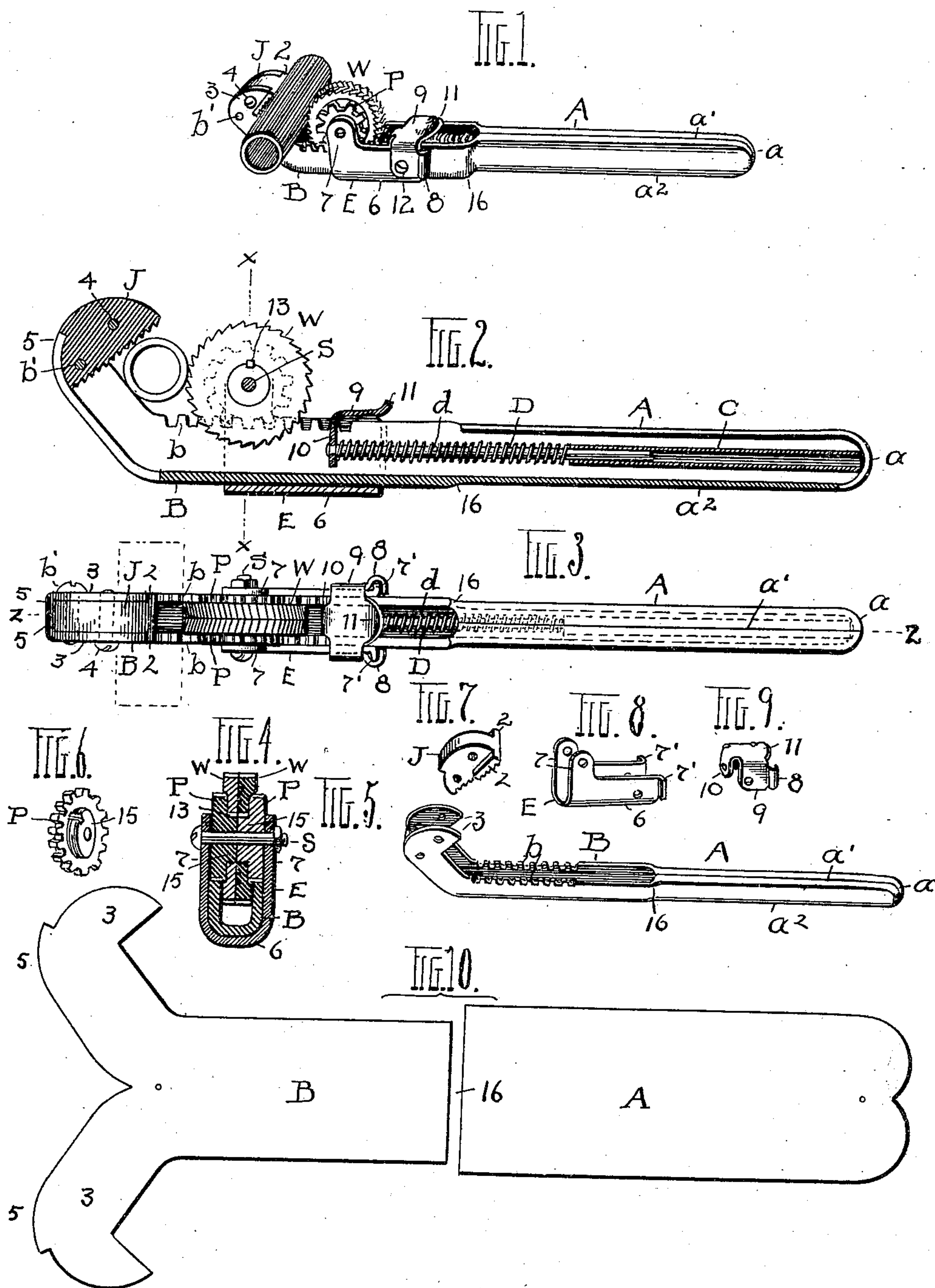
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J. T. BURR.
WRENCH.

(Application filed May 19, 1902.)

(No Model.)



ATTEST
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WRENCH.

SPECIFICATION forming part of Letters Patent No. 710,179, dated September 30, 1902.

Application filed May 19, 1902. Serial No. 107,930. (No model.)

To all whom it may concern:

Be it known that I, JESSE T. BURR, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pipe-Wrenches; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pipe-wrenches; and the invention consists in the construction and combination of parts substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved wrench, showing a section of a pipe gripped therein. Fig. 2 is a longitudinal central sectional elevation thereof, and Fig. 3 is a plan or top view of the wrench. Fig. 4 is a cross-section on line *x x*, Fig. 2; and Fig. 5 is a reduced perspective view of the handle and body part alone. Figs. 6, 7, 8, and 9, respectively, are views of different details of the wrench, Fig. 6 showing one of the pinions, Fig. 7 the fixed jaw, and Figs. 8 and 9 portions of the carrier for the gripping-wheels. Fig. 10 is a diagrammatic view of the two plates which are used to make up the body and handle of the wrench.

As thus shown and described, the invention comprises details of construction which experience with this kind of wrenches has proved to be very desirable and the value of which will appear in the further description of the said parts herein. First of all, there is a material improvement in the combined handle and body of the wrench itself over the construction hitherto used in this style of wrenches and as seen in both Letters Patent to J. Browning, No. 171,982, of 1876, and No. 594,775, of 1897, on which the present invention is an improvement. In both said patents a cast-metal handle and body are used. By casting the handle and body in one piece it was not practicable to make it both strong and light. If it was given the requisite strength for heavy work, it necessarily had very inconvenient weight, which made the wrench objectionable and clumsy to use, and if strength were sacrificed to

lightness the wrench was correspondingly weakened and liable to break under strain. Hence I conceived the idea of making the handle and body both of sheet or plate metal and have formed the handle portion A out of one kind and the body B out of another kind—that is, I employ steel of suitable temper, quality, and weight for the body B, while for the handle A, I use a much lighter and softer steel, preferably, and these two parts are electrically or otherwise welded and wrought to the shape shown. In this way I not only produce an exceedingly light and easily-handled wrench, considering its size and strength, but one which also has such strength that it will withstand any use to which it can be applied without danger of breaking. Of course by cutting the stock from a plate I can give all that can be needed to the place of greatest strain and make light the unstrained portions.

The relative thickness of the handle and the body A and B, respectively, is seen especially in Figs. 2 and 3, and since the handle is bent around into the form shown it is exceedingly strong and convenient and comfortable to grip. The body B has a rack *b* in its opposite edges, which may be formed by the same die that cuts out the pattern B in Fig. 10 or afterward, as may be found most convenient.

When the handle and body are shaped and welded and ready for the attachment of the other parts, the construction is as shown in Fig. 5, wherein the handle also is shown as provided with a rounded extremity *a*, which serves the further purpose of centering the guide-tube C for spring-pressed rod D, as will be seen farther on. Now the details or parts associated with this construction of handle comprise, first, a transversely-serrated or toothed jaw J, which is provided with laterally-extended shoulders 2 at its sides, adapted to rest against the shoulders of hooks 3 on body B, and between which hooks the said jaw is firmly fastened by a pair of screw-bolts 4, as here shown. By resting the shoulders or flanges 2 against the hooks 3 they take up a large portion of the pressure upon the jaw, and thus relieve bolts 4, and the said jaw is designed to be permanently fixed between said hooks, but has the advantage of being

separately removable when removal is desired—as, for example, for the sharpening of the gripping-teeth or in case of breakage, if the latter should occur. Then there is the further and material advantage that by having the jaw a separate piece from the body B it can be made of any degree of hardness regardless of the character or quality of the hooks between which it is fastened. This was impossible when a whole casting was used, and injury to one part frequently necessitated the casting away of the entire wrench. It will be noticed also as a feature of construction that the base of said hooks has inwardly turned and curving flanges 5, against which the foot of the jaw J firmly rests, so that there is also a backing for said jaw at this point to take up strain and to strengthen body B and prevent breakage.

E is the gripping-wheel carrier, which likewise is formed from separate pieces of struck-up sheet or plate metal, the separate portions of which are seen in detail, Figs. 8 and 9. The immediate carrying portion of said carrier has upturned projections 7 for the spindle or shaft S of gripping-wheels W and is formed in substantially U shape in cross-section, as seen in Fig. 4. At its rear extremity at each side are lateral ears 7', which are interlocked with inwardly-turned ears 8 on the top portion 9 of said carrier. The said portion 9 also has a downwardly-projecting tongue 10, with a hole through which is engaged the inner extremity or spring-carrying rod D, upon which is spring *d* and a lip 11 for engagement by finger or thumb to retract the carrier. The said carrier as thus constructed has its body portion 6 extended around the outside of the body B of the wrench and made freely slidable thereon, while the top and rear connecting portion 9 thereof spans across the top and side of the wrench and is fastened to the body 6 at each side by short screws 12 in addition to the interlocking of ears 7 and 8.

This interlocking and screwing together of the portion 6 and 9 makes the carrier as rigid and serviceable as if it were cast or otherwise produced in a single piece, but with the very great advantage of being easily separable. This can be done by simply removing the short screws 12 and lifting out the portion 9. This is a matter of very great convenience, as I have found in these wrenches, because there is liable to be occasion at almost any time to separate the parts to make possible repairs or to replace parts.

Hitherto it has likewise been the practice to make the gripping-wheels W and the corresponding pinions P in one piece cast together; but experience has shown that cast-metal gripping-wheels are undesirable for a wrench of this kind, and hence I conceived the idea of making the said wheels each in separate parts out of steel that has been suitably tempered and hardened and likewise making the pinions D separately. This en-

ables me to use a different grade of steel for each, and they are brought together for cooperative service by uniting them by means of a spline 13, Fig. 2, thus causing pinion P of each wheel to act in union with its gripping-wheel the same as if it were integral therewith. The spindle or bolt S extends through carrier E and all the said wheels and serves as an axis of rotation therefor. Said pinions are also in mesh with teeth *b* on body B, as heretofore, and the gripping-wheels are reversely serrated, with the lowest point in each inside. By these means I am enabled to restore either a carrier-wheel or a pinion as either may become impaired without losing both a carrier-wheel and pinion because one or the other happens to become injured or broken and both are available for cutting the teeth, which could not be done if they were one. Heretofore there has been found more or less occasion to repair the gripping-wheels because their serrations would become damaged in use. Such danger has been reduced to the minimum, as I believe, by employing suitable steel with a suitable temper for this purpose instead of cast metal; but now they can be repaired or cast away, while the pinions are preserved.

The pinions P have screw-threaded hubs 15, on which wheels W are carried, and the spline 13 is in these hubs.

Referring now again to the manufacture of the handle and body of the wrench, the handle proper, in all the larger sizes thereof, is necessarily wrought or turned over a mandrel into its final shape, as shown, with a butt-joint at α' centrally lengthwise and integral back α^2 with the sides thereof, and this done it is made to be welded to the body B. The body B likewise is bent into shape by turning its sides inwardly and further by turning its flanges 5 inward at right angles to these sides, and these, too, form a butt-joint at their close meeting edges. These flanges constitute the back of the neck of the fixed jaw and contribute very greatly to the strength of said jaw, besides forming an abutment for the inset parts J, which is further secured at its top by screw 4 and at its base by screw *b'* or its equivalent. In this way the sides 3 of the body part B, entering into the fixed jaw and referred to herein as "hooks," are firmly clamped together and to the jaw member J.

The blanks A and B are both cold-pressed into shape and afterward welded at their union 16, and while the handle is formed of a soft light easily-fashioned steel plate the body B is constructed out of high-carbon steel, with weight according to the size of the wrench and about twice as heavy as the handle.

What I claim is—

1. In a wrench, a combined handle and body formed from two pieces of sheet-steel of different temper and thickness, the said handle being hollow and welded to the body, and

the body formed with parallel sides and edges terminating at said weld, substantially as described.

2. The wrench having a pair of substantially hook-shaped jaw-supports at its gripping end integral with its body and projecting above the same at an inclined angle, and a jaw set between said supports and across the front thereof, the said body having parallel toothed edges, in combination with gripping-wheels opposite said jaw and pinions connected with said wheels engaging said toothed edges, substantially as described.

3. The combined handle and body of the wrench having a set of integral shouldered hook-shaped jaw-supports and a jaw having its body clamped between said supports and provided with a transversely-serrated face overlapping the front edges thereon, in combination with a rotatable gripping-jaw and mechanism engaged on the body of the wrench carrying said gripping-jaw, both said jaws being above the plane of the body of the wrench, substantially as described.

4. The combined body and handle of the wrench having a pair of hook-shaped jaw-supports 3 and intumed flanges 5 in the neck thereof forming an abutment for a jaw, in combination with a jaw clamped between said supports and seated against said flanges, and a rotatable jaw supported on the body of the wrench, and comprising a set of wheels and a separate pinion for each wheel, substantially as described.

5. In a wrench, a set of separate gripping-wheels side by side and a pinion detachably interlocked with each wheel, and a single shaft for said wheels and pinions, a slidable carrier engaged around the body of the

wrench and supporting said shaft, whereby new pinions and wheels may be substituted, and a fixed jaw opposite said wheels, substantially as described.

6. In a pipe-wrench, a suitable body and handle, a wheel-carrier slidable thereon and consisting of a main portion engaged above the side of said body and an auxiliary portion across the top of the wrench and having ears at its sides interlocked with corresponding ears on said main portion, and separate screws at the sides uniting said auxiliary portion with the main portion of the carrier, whereby the carrier can be taken apart, substantially as described.

7. The wrench comprising a set of rotatable gripping-wheels, a carrier in which said wheels are mounted comprising a body 6 having outwardly-projecting ears 7 at its rear, and a top cross part 9 having inwardly-projecting ears 8 engaging the ears 7 and screws connecting said parts together, substantially as described.

8. The wrench-body and handle thereon having a rounded outer extremity, and a gripping-wheel carrier on said body having a downwardly-projecting tongue 10, in combination with means to hold said carrier in working position comprising a spiral spring and a rod supporting the same, and a guide-tube for said rod within the wrench-handle and centered in said rounded extremity, substantially as described.

Witness my hand to the foregoing specification this 12th day of May, 1902.

JESSE T. BURR.

Witnesses:

R. B. MOSER,
T. M. MADDEN.