Nov. 1, 1932. E. J. CAREY 1,885,895

TOOL

Filed Sept. 21, 1931

Fig. 6.

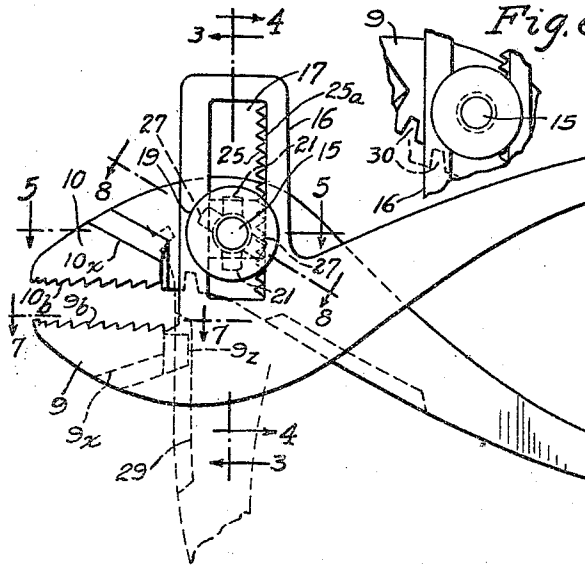


Fig. 1.

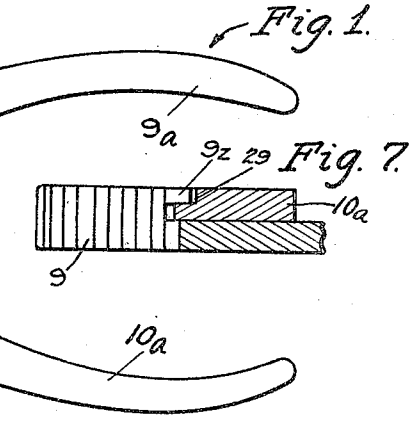


Fig. 7.

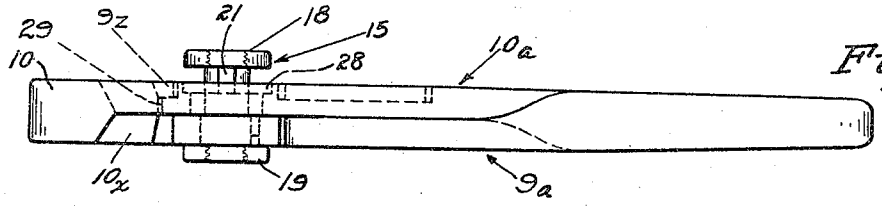


Fig. 2.

Fig. 3.

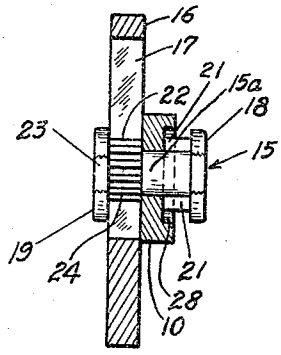


Fig. 4.

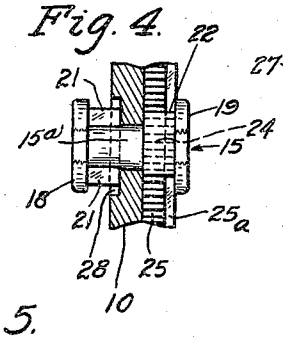


Fig. 8.

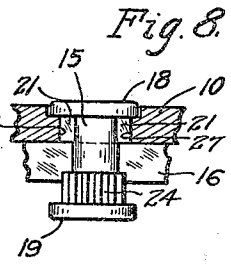
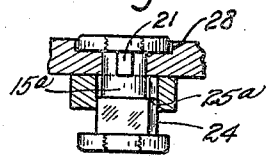


Fig. 5.



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UNITED STATES PATENT OFFICE

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TOOL

Application filed September 21, 1931. Serial No. 564,051.

This invention relates to a mechanic's combination tool among the functions of which are those of a pipe wrench and of a pair of pliers.

An object of the invention is to provide improved adjustable means for quickly and conveniently converting the tool from a pair of pliers into a tool adapted to function as a pipe wrench, and vice versa.

Other objects of the invention are to improve generally upon and simplify the construction of a tool which is adapted to perform the aforementioned functions and also to be used for other purposes which will hereinafter be specified.

Other objects, advantages and features of the invention may hereinafter appear.

Referring to the accompanying drawing which illustrates what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is a side elevation of the tool, broken lines indicating a different operative position of one of the pivot elements thereof.

Fig. 2 is an edge elevation of the tool the pivot thereof being in the position which it occupies when the tool is used for a pipe wrench or pliers, as shown in Fig. 1.

Fig. 3 is a cross section on line 3—3 of Fig. 1.

Fig. 4 is a fragmental cross section taken on the same plane as Fig. 3 but looking in the opposite direction.

Fig. 5 is a fragmental transverse section on line 5—5 of Fig. 1, with the pivot member set for adjustment for the jaw members.

Fig. 6 is a fragmental detail illustrating the use of the device as a wire cutter.

Fig. 7 is a cross section on line 7—7 of Fig. 1.

Fig. 8 is a cross section on line 8—8 of Fig. 1, with the jaw members in the open position, as shown in dotted lines.

Referring in detail to the drawing, the tool comprises two cooperating jaw members 9 and 10 which are respectively provided with the handle portions 9*a* and 10*a*. The jaw member 9 is provided with gripping teeth 9*b* and the jaw member 10 with gripping teeth 10*b*. These jaw members are pivotally connected together by means of the pivot member 15, the jaw member 9 having an extension 16 provided with a slot 17, said slot being in an operative relation to said pivot member 15.

Said pivot member 15 is provided at one end with a nut 18, a nut 19 screwing on to the other end of said member. Said pivot member 15 may be considered as a bolt, there being radially projecting keys 21 provided thereon adjacent the nut 18, the other end portion of said bolt having a squared part 22 which terminates in the reduced threaded portion 23 upon which the nut 19 screws.

One side of the squared portion 22 is provided with a series of teeth 24, the slot 17 of the jaw extension 16 being provided along its rear long edge with a series of teeth 25 which are adapted to cooperate with said teeth 24 when the adjacent side of the jaw extension 16, provided with the jaw members 9 and 10 are at such time in lateral contact with each other.

The jaw 10 is pivotally fitted around the reduced central portion of the pivot member 15 at 15*a* and is provided at each side of the pivot opening with a key seat 27 which is adapted to receive the diametrically opposite keys 21 of the pivot member, when said pivot member is in the position shown in Fig. 8. Said jaw member 10 is also provided in its outer side with a circular countersink 28 which surrounds the pivot opening thereof. Hence when the pivot member 15 is moved to its right hand position as seen in Fig. 3, the keys 21 are freed from the countersinks 28 with which they cooperate.

The jaw 10 is shown provided with an internal lateral extension 10*x* near its toothed extremity which is adapted to abut against the adjacent portion of the slotted extension 16 to limit the opening movement of the jaw, and the jaw 9 is preferably provided with a similar lateral extension 9*x*. Said extension 9*x* is provided with a lip 9*z* which projects into the adjacent grooved portion 29 of the jaw 9 in order, during the operation of the tool, to keep the jaw members 9 and 10 in lateral contact with each other.

The jaw 10 is shown provided with a wire

cutting notch 30 which is positioned to cooperate with the adjacent edge portion of the base part of the slotted extension 16 in order to perform its cutting function.

The toothed portion 25 of the slotted extension 16 does not extend the complete width of said extension but terminates short of the outer face thereof at 25*a*. This construction leaves a smooth space between the outer ends of the teeth and that side of the extension. By sliding the bolt endwise to the position shown in Fig. 5, the bolt is so adjusted that the square portion thereof together with its teeth is brought into a slidable engagement with the external part of the slotted extension, so that said part forms a guide therefor along which said bolt may be adjusted in order to offset the pivot member to the desired extent.

It will be seen that in all adjustments the pivot member 15 is located at a point which spaced away from the mid-width of the base portions of the gripping jaws of the tool. Or, in other words, the pivot member of the tool is always offset in an edgewise manner with relation to the jaws away from a plane extending lengthwise of the tool, said plane being located at right angles to the plane in which the handle members move and midway between the gripping elements of the tool whatever their operating positions may be. For this reason, whenever force is applied to the handle members tending to bring the gripping elements toward each other, such force is directed in a more advantageous manner than it would be if the pivot member were not offset as above stated. This feature of the invention is of special value when using the tool as a pipe wrench or for an analagous purpose, it being possible to apply torsion to a pipe or like object by external pressure upon one handle portion only of the tool after the tool has been placed in the gripping position.

Operation.—When the tool is to be used as a pair of pliers, the pivot member 15 is moved in the pivot aperture to the position shown in Fig. 3 wherein the nut 19 thereof is in contact with one side of the tool and the nut 18 thereof is sufficiently spaced away from the other side of the tool to bring the keys 21 out of the engaging position with the key seats 27. Therefore at this time the teeth 24 of the squared portion of the tool will be brought into engagement with the teeth 25 of the slotted extension 16. If, at the same time, the pivot member 15 is located near the lower portion of the slotted extension 16, as shown in Fig. 1, the tool is adjusted for being used as an ordinary pair of pliers, it being possible to close the jaws to the extent shown in full lines in Fig. 1 wherein a considerable space still remains between the gripping jaws. If the pivot member 15 had been brought down into contact with the inner end of the slotted extension 16, the teeth of the jaws could not have been brought into complete contact with each other. In both of these adjustments the cooperating toothed portions 24 and 25 hold the pivot member 15 in fixed relation to the jaw member 10, the keys 27 riding upon the underlying surface of the jaw member 10 unless the jaws of the tool are opened wider than the normal operating position thus permitting the keys 21 to be brought into alinement with the key seats 27 in the jaw member 10.

When the tool is to be used as a pipe wrench the nut 18 of the pivot member is brought down to the circular countersink 28 so that the teeth 24 and 25 are disengaged from each other, and at the same time the pivot member 15 is moved as far away from the inner end of the slotted extension 16 as may be necessary to fit the tool upon the size of pipe to be gripped. When the toothed portion 24 of the pivot member is in engagement with the toothed portion 25 of the slot, the frictional contact of these toothed portions with each other and of the pin as a whole where it engages the jaws of the tool, is sufficient to prevent said toothed portions from becoming disengaged from each other, when the keys 21 are in engagement with the seats 27.

I claim:

1. In a tool of the kind described, a pivot member, and a pair of cooperating gripping members operatively connected by said pivot member, one of said members having a slotted extension which is internally toothed along one side and the other of said gripping members having an aperture therethrough wherein said pivot member is slidable in an endwise manner, said aperture being provided with a pair of oppositely disposed key seats, said pivot member having a circular central portion to fit the circular portion of said aperture and being provided at each end with a head of greater diameter than the portions of said pivot member between said heads, said pivot member having adjacent to one of said heads a diametrically enlarged portion provided with teeth which are adapted to cooperate with the aforementioned teeth of said slotted extension, said pivot member having adjacent to its other head a pair of oppositely disposed radially extending keys adapted to cooperate with said key seats, the length of said pivot member between its said toothed portion and key portions being sufficient to permit of endwise adjustment thereof to bring the toothed portion thereof into and out of engagement with the toothed side of said slot and also to bring said keys into and out of engagement with said key seats.

2. In a tool of the kind described, a pivot member, and a pair of cooperating gripping members operatively connected by said pivot member, one of said members having a slot-

ted extension which is internally toothed along one side throughout a portion only of the width of its slot and the other of said gripping members having an aperture therethrough wherein said pivot member is slidable in an endwise manner, said aperture being provided with a pair of oppositely disposed key seats, said pivot member having a circular central portion to fit the circular portion of said aperture and being provided at each end with a head of greater diameter than the portions of said pivot member between said heads, said pivot member having adjacent to one of said heads a diametrically enlarged portion provided with teeth which are adapted to cooperate with the aforementioned teeth of said slotted extension, said pivot member having adjacent to its other head a pair of oppositely disposed radially extending keys adapted to cooperate with said key seats, the length of said pivot member between its said toothed portion and key portions being sufficient to permit of endwise adjustment thereof to bring said keys into and out of engagement with said key seats and to bring the toothed portion of said pivot member into and out of engagement with the toothed portion of said slot while at all times preventing the complete withdrawal of the toothed portion of the pivot from said slot.

In testimony whereof, I hereunto affix my signature.

EDWARD J. CAREY.