H. G. NORWOOD.

ALLIGATOR WRENCH.

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1,328,389. Patented Jan. 20, 1920.

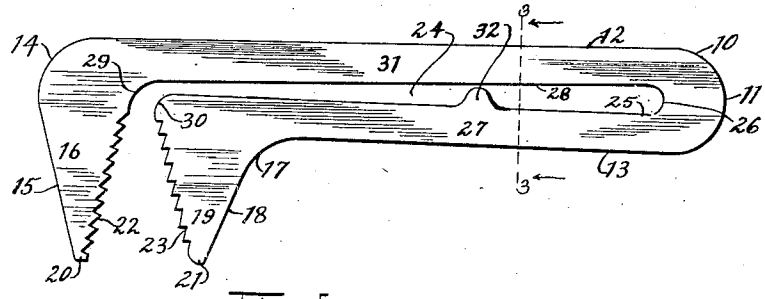


Fig. 1.



Fig. 2.

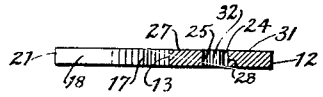


Fig. 3.

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HARRY G. NORWOOD, OF BALTIMORE, MARYLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NAPOLEON B. LOBE AND S. BURNS RATCLIFFE, BOTH OF BALTIMORE, MARYLAND, TRADING AS N. B. LOBE & CO., OF BALTIMORE, MARYLAND.

ALLIGATOR-WRENCH.

1,328,389. Specification of Letters Patent. Patented Jan. 20, 1920.

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To all whom it may concern:

Be it known that I, HARRY G. NORWOOD, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Alligator-Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to solid wrenches of the type usually referred to as "alligator wrenches."

One object of my invention is to provide a solid wrench with the jaws having a limited relative resilient movement and formed integrally with the handle from one piece of metal.

A further object of my invention is to provide an alligator wrench which can be readily stamped from sheet metal.

A further object of my invention is to shape and size the teeth so as to provide for a maximum gripping effect with a maximum capacity for operating upon different sizes of pipes, nuts, bolts, etc.

A further object of my invention is to provide for primary and secondary resilient movements of one jaw with reference to the other jaw, the first resilient movement being against a force that is somewhat less than the force against which the secondary resilient movement takes place.

In carrying out my invention, I shape the wrench as shown in the accompanying drawings, in which:—

Figure 1 is a profile view of my improved alligator wrench.

Fig. 2 is a side view of the wrench shown in Fig. 1.

Fig. 3 is a section along the line 3—3 in Fig. 2 looking in the direction of the arrow.

10 is the handle of my improved wrench which is semi-circular as at 11, and the edges 12 and 13 are substantially parallel to each other and tangential to the semi-circle at 11.

The edge 12 on its front end is tangential to the curve 14 and the latter is tangential to the edge 15 of the jaw 16 and said edge 15 is disposed at an acute angle to the edge 12.

The edge 13 on its front end is tangential to the curve 17 and the latter is tangential to the edge 18 of the jaw 19 and said edge 18 is disposed at an obtuse angle to the edge 13.

The edges 20 and 21 respectively of the jaws 16 and 19 are made of any approved length so that the metal between the series of teeth 22 and 23 and the edges 15 and 18 adjacent thereto may be of sufficient strength.

The series of teeth 22 and 23 are mutually inclined at an acute angle and they are inclined at acute angles respectively to the edges 15 and 18.

I preferably incline the series of teeth 22 and 23 toward each other at an angle of twenty-eight degrees and the reëntrant angles between the series of teeth 22 and 23 and the edge 12 are in each case equal to seventy-six degrees.

While I have shown the series of teeth 22 and 23 mutually disposed at the angle specified, it is to be understood that unless specified in the claims, I do not desire to be limited to this particular angle. I have found that this angle between the series of teeth 22 and 23 gives me a sufficient capacity in the wrench for operating upon different sizes of tubes, bolts, nuts and so on, and at the same time, insures a good grip of said teeth thereon, but it is to be understood that the angle between the series of teeth 22 and 23 may be made of any suitable size.

The teeth in the series of teeth 22 are made somewhat smaller than the teeth in the series of teeth 23, the purpose of this variation in size being to increase the probability of the teeth coming in contact with unmarred portions of a round tube or rod when the wrench is being used thereon.

The teeth in the series of teeth 22 and 23 may be cut at right angles to the sides of the wrench, or said teeth may be disposed at acute angles to said sides if preferred. The teeth in the series of teeth 22 and 23 may be made of the same size if preferred.

In order to provide for a relative resilient movement of the jaws 16 and 19, I form the slot 24 in the handle of the wrench and said

slot is so shaped that the edge 25 thereof where it is tangential to the curve 26 is about one-thirty-second of an inch closer to the edge 13 than it is to the edge 13 where the latter is tangential to the curve 17, the purpose of this shaping of the slot being to provide a resilience in the limb 27 of the handle near the curve 26 while insuring stiffness near the jaw 19, for it is evident that during the operation of the wrench, there will be a crushing stress upon the limb 27. I also form the slot 24 so that the edge 28 thereof where it is tangential to the curve 26 is somewhat closer to the edge 12 than to the edge 12 where the latter is tangential to the curve 29, and the distance between the point where the edge 28 meets the curve 29 and the point where the edge 25 meets the curve 30 is substantially one-eighth of an inch so as to provide for a relative movement of said points of one-eighth of an inch in order to enable the series of teeth 22 and 23 to approach each other.

It is evident that this shaping of the slot 24 also provides a resilience in the limb 31 near the curve 26, also that during the operation of the wrench there is a tensile stress upon the limb 31.

The resilience in the limbs 27 and 31 is provided near the curve 26 so that when the series of teeth 22 and 23 grip upon the object to be turned, said limbs will move as substantially upon pivots adjacent to the curve 26 and cause the series of teeth 22 and 23 to slightly approach each other and grip the object more firmly.

I also provide the nose 32 on the edge 25. The nose 32 is located at a distance from the points of tangency of the edge 25 and curve 26, approximately equal to one-third the distance from said points to the middle of the opening between the uppermost pair of teeth in Fig. 1.

The tip of said nose is located about one-sixteenth of an inch from the edge 28, hence during the operation of the wrench, the limbs 27 and 31 have a resilient movement as a whole, which movement provides for the preliminary adjustment of the wrench to the object to be turned. Thereafter, the limbs 27 and 28 have a resilient movement in the portions thereof to the left of the nose 32 in Fig. 1, and said second resilient movement insures that the teeth 22 and 23 will follow up the object to be turned, and increase the grip of the teeth thereupon.

It is to be noted that the teeth in the series of teeth 22 are formed trenchant toward the edge 12 and that the teeth in the series of teeth 23 are formed trenchant in the opposite direction. Said teeth may be cut by milling or with any approved form of punching die.

While I have specified certain dimensions which when observed in forming a wrench of approximately the size shown in Fig. 1 will insure the proper resilience of the limbs 27 and 31, I do not desire to be limited to these particular dimensions. Any dimensions which will give the specified resilience to said limbs will produce a proper functioning of the teeth 22 and 23.

Thus it will be noted that I provide a simple, cheap and effective alligator wrench which is free from adjustment and extremely effective in use.

I claim:—

1. An alligator wrench comprising a handle formed integrally with a pair of jaws having facing edges mutually inclined and each of said edges being provided with teeth, a slot in said handle dividing said handle into two limbs, said limbs being joined together at one end and the other end of each limb being joined with one of said jaws, said jaws being located so that the turning stress will be transverse to said limbs, and a nose on one limb located to strike the other of said limbs during the application of the turning stress.

2. An alligator wrench comprising a handle formed integrally with a pair of jaws having facing edges mutually inclined and each of said edges being provided with teeth, a slot in said handle dividing said handle into two limbs, said limbs being joined together at one end and the other end of each limb being joined with one of said jaws, said limbs having near their junction less resistance to a bending stress than at other portions, and a nose on one of said limbs normally out of contact with and located to strike the other of said limbs.

3. An alligator wrench comprising a handle formed integrally with a pair of jaws having facing edges mutually inclined and each of said edges being provided with teeth, a slot in said handle dividing said handle into two limbs and means for varying the forces opposed by said limbs to the mutual movement of said jaws.

4. An alligator wrench having a handle formed in two limbs, a jaw on one limb having an edge formed at an obtuse angle to said limb, a jaw on the other limb having an edge formed at an acute angle to said last named limb, said edges mutually facing and having teeth thereon, and a nose on one limb normally out of contact with the other limb and located to strike said last named limb when said teeth are applied to the object to be turned and pressure is applied to said handle.

5. An alligator wrench comprising a handle formed integrally with a pair of jaws having facing edges mutually inclined and each of said edges being provided with teeth, a slot in said handle dividing said handle into two limbs, said limbs being joined together at one end and the other end

of each limb being joined with one of said jaws, said limbs having near their junction less resistance to a bending stress than at other portions, whereby said jaws normally revolve about centers located near the junction of said limbs, and a nose on one of said limbs normally out of contact with and located to strike the other of said limbs, whereby thereafter said jaws revolve substantially about the point of contact of said nose with said limb.

In testimony whereof, I affix my signature.

HARRY G. NORWOOD.