May 13, 1930. F. ENGLISH 1,758,504

FLEXIBLE HANDLED TOOL

Filed Sept. 24, 1925

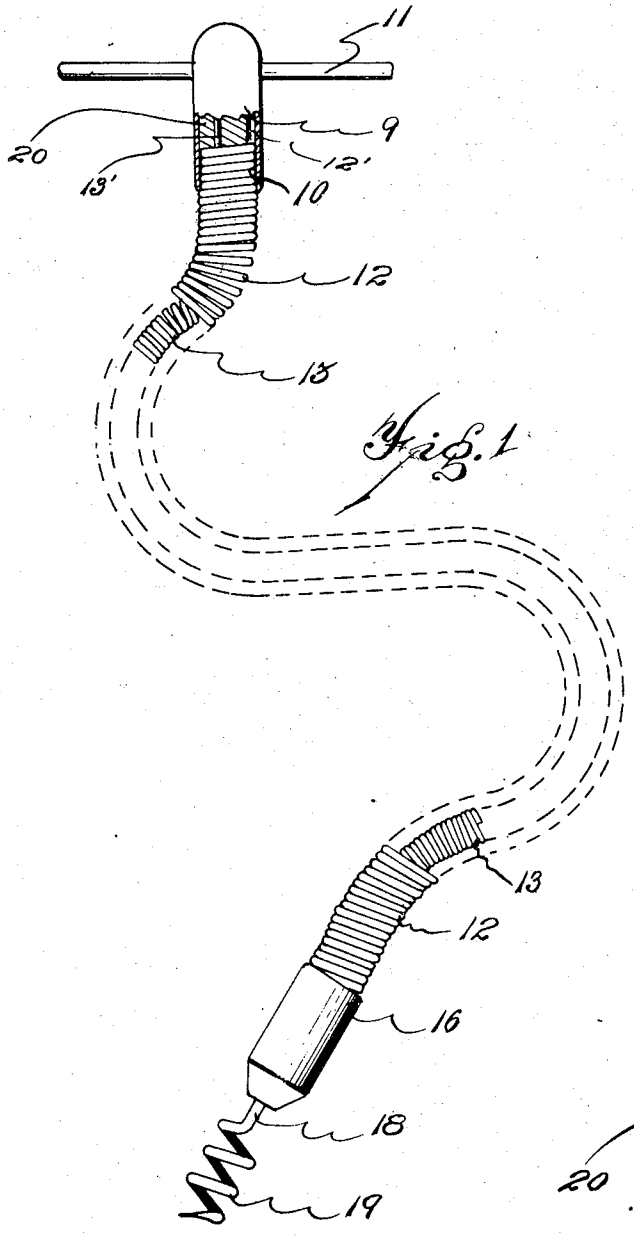


Fig. 1

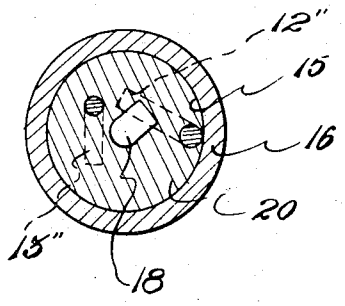


Fig. 3

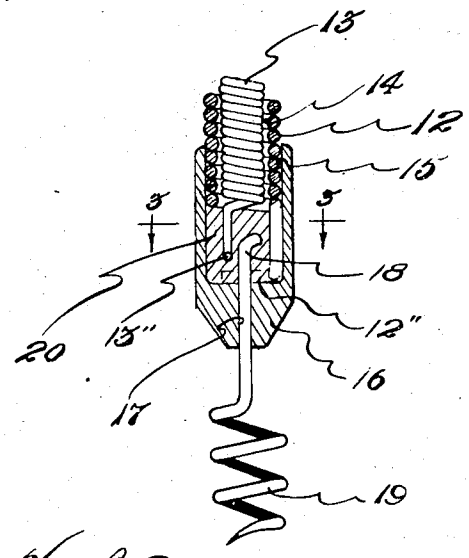


Fig. 2

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UNITED STATES PATENT OFFICE

FRANK ENGLISH, OF DETROIT, MICHIGAN

FLEXIBLE-HANDLED TOOL

Application filed September 24, 1925. Serial No. 58,271.

My invention relates to a flexible handled tool and is intended as an improvement on my invention for which I have applied for Letters Patent, my application Serial Number 27,987 now issued as Patent No. 1,653,995, dated December 27th, 1927.

The tool referred to in the said application and as shown herein comprises a flexible handle made from a closely woven coil of wire. Where a single coil is used, it has been discovered that there is considerable lost motion and that in using the handle for effecting a rotation of a working tool, considerable turning would have to be effected in order to take up the lost motion before the working tool itself would become operative. Such an arrangement is operative, but is not as efficient as desirable for commercial development of the tool, and to this end the present invention comprises a flexible handled tool in which the lost motion is eliminated and the flexibility is in no way impaired. This is accomplished by placing within a handle forming coil of wire a smaller coil of closely woven wire which is coiled in the opposite direction to the outer coil, the opposite ends of the two coils being secured. In order to assure the proper and desired flexibility of the handle, the outer surface of the inner coil is spaced from the inner surface of the outer coil. The use of the two coils assembled in this manner eliminates lost motion and back lash, but it is necessary that the strength of the two coils to resist torque be equal so that it is necessary to form the inner coil from different wire than the outer coil. In this way there is a definite proportion between the torque resistance of the two coils having a relation to the strength of the wires from which the coils are made.

Other features of the invention will appear as the description of the construction proceeds.

The invention consists in the combination and arrangement of parts hereinafter described and claimed.

The invention will be best understood from a reference to the accompanying drawings which form a part of this specification and in which,

Fig. 1 is a side elevational view of the invention with parts removed and parts in section,

Fig. 2 is a longitudinal central sectional view of the lower end of the invention, and

Fig. 3 is a sectional view taken on substantially line 3—3 of Fig. 2.

As shown in the drawings, there is provided a head 9 provided with a socket 10 and a hand grip or cross arm 11 projected through the head 9. A handle or shank forming portion 12 is formed from coiled wire having one end 12′ angularly turned and secured in the socket 10. Positioned within the coil 12 is a coil 13, which is of smaller outside diameter than the inside diameter of the coil 12 and which is formed from wire coiled in the opposite direction to the coil 12. The end 13′ of the coil 13 is angularly turned and secured in the socket 10 by a sweating process. If desired, solder 20′ may also be positioned in the socket 10 for securing these parts in position. The resistance of the coil 12 to torque is preferably equal to the resistance of the coil 13 to torque. This resistance to torque is made equal in the two coils which are of different diameters by the proper variation of the material from which the coils are made.

A tool holding head 16 is provided having the socket 15 formed therein, adapted for the reception of the lower ends of the coils 12 and 13. The end 13″ of the coil 13 is angularly turned, as shown, as is likewise the end 12″ of the coil 12, these angularly turned ends being retained in the socket 15 by solder 20, or sweated therein, as desired. Projected through a bore 17 formed in the head 16 is a tool shank 18 having its inner end angularly turned and secured in the solder 20. The outer end of the shank 18 is formed into a suitable tool 19, in the present case being shown as a cork screw.

The tool is shown as particularly adaptable for removing packing from stuffing boxes. It is evident, however, that the tool 19 may be dispensed with and replaced with other suitable tools.

By forming the coil 13 with the outside diameter less than the inside diameter of the coil 12, a space 14 is provided between these

coils. The presence of this space is desirable to render the handle flexible in the degree desired, it often being necessary to flex the handle into such a position as is shown in Fig. 1. Where the inner coil is in engagement with the outer coil, this flexibility is lessened to a marked degree, and consequently the efficiency of the handle diminished.

By having the coils 12 and 13 oppositely coiled and of equal torque resistance, the tool 19 responds readily to any torsional strain delivered to the head 9.

The pressure of the coils arranged as shown also obviates the necessity of any nonelastic material projected through the inner coil. This is due to the fact that a pulling strain exerted upon the shank or handle having a tendency to separate the coils 12 will also have a tendency to rotate the shank in one direction. As this strain is delivered to the coil 12, it is also delivered to the coil 13, so that as the coils 12 tend to separate and rotate in one direction, the coils 13 tend to separate and rotate in the opposite direction, thus each neutralizing the other and preventing a separation of the coils in either. It is evident therefore that the use of a nonelastic member for resisting a pulling strain is unnecessary.

While I have illustrated and described the preferred form of construction, I do not wish to limit myself to the precise details of structure shown in the drawings, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A flexible handled tool of the class described comprising: a pair of heads, one being a tool bearing head; a handle connecting said heads, said handle comprising an inner coil wire member and an outer coil wire member, said coils being wound in the opposite direction and the torque resistance of the said coils bearing a relation to each other to eliminate lost motion and backlash upon twisting strain being exerted on said handle.

2. A flexible handled tool of the class described, comprising: a pair of heads; a flexible handle for connecting said head, said handle comprising an outer coiled wire member and an inner coiled wire member, said members being coiled in opposite directions and the torque resistance of the coils bearing a relation to each other sufficiently to eliminate lost motion and back lash and being spaced from each other diametrically sufficiently to be non-interfering with each other during the flexing of the handle.

In witness whereof, I have signed the foregoing specification.

FRANK ENGLISH.