

June 18, 1940.

F. E. MAYOTTE
ELECTRIC DIE THREADER

2,205,148

Filed May 15, 1939

2 Sheets-Sheet 1

FIG. 1.

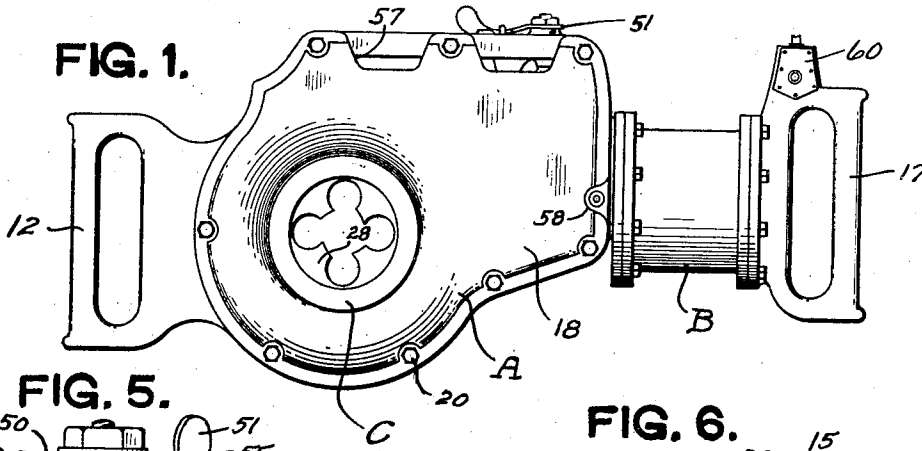


FIG. 5.

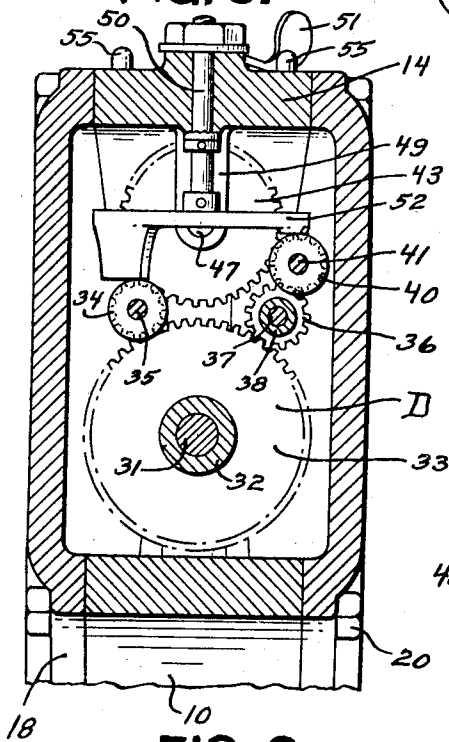


FIG. 6.

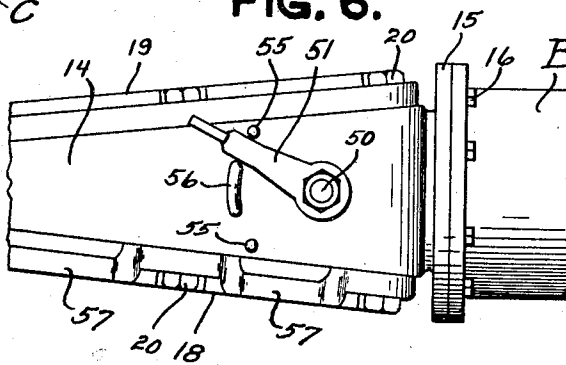


FIG. 7.

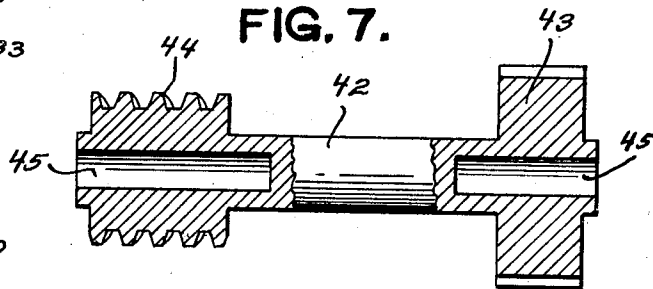


FIG. 8.

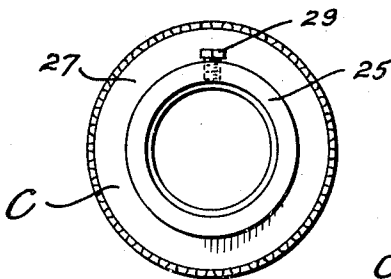
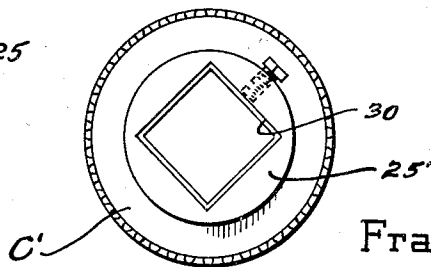


FIG. 9.



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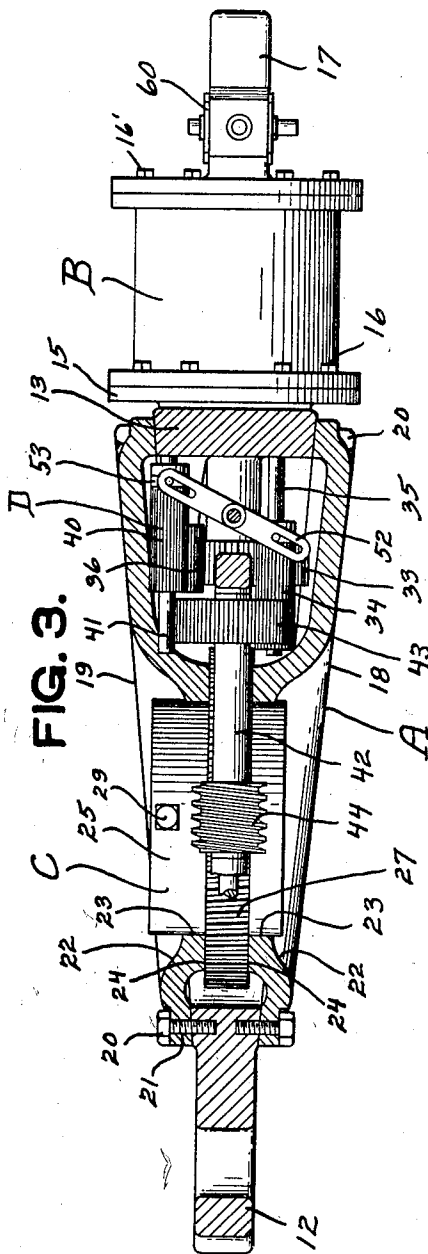
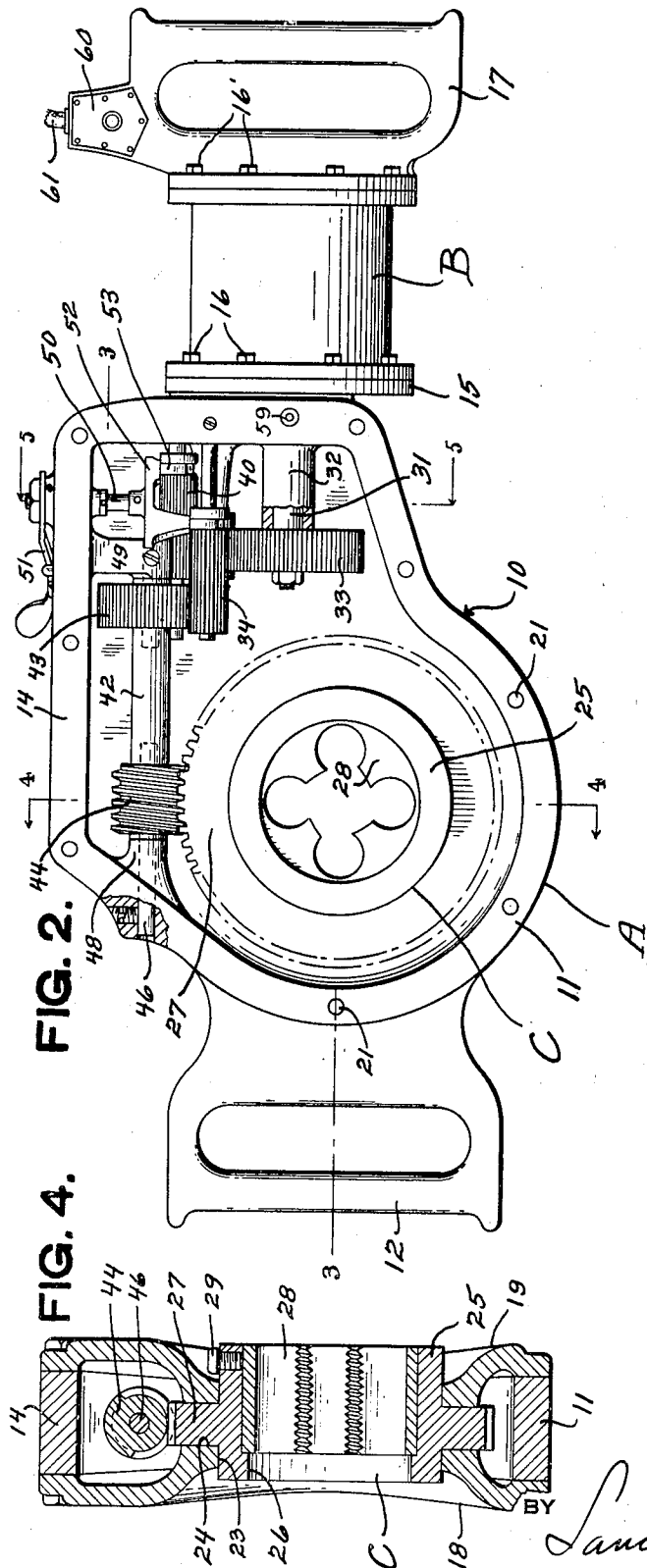
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ELECTRIC DIE THREADER

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Application May 15, 1939, Serial No. 273,788

4 Claims. (Cl. 10—89)

The present invention relates to thread cutting tools and the primary object of the invention is to provide a portable power driven threading tool primarily designed for cutting threads on bolts, rods, small pipe, etc.

A further object of the invention is to provide a portable self-contained electrically operated thread cutting tool of improved construction permitting use of the tool in very restricted areas.

10 A further object of the invention is to provide an electric die threader embodying a readily interchangeable die holder or shell permitting use of either solid square or round dies which may be available to the user.

15 A further object resides in the novel arrangement wherein the removable cover plates form bearings for the combined worm wheel and die holder and permit ready changing of the holder.

20 A still further object resides in the novel drive gearing between the motor and the die stock embodying means whereby the die after being rotated in one direction for cutting the threads, may be rotated in the opposite direction for withdrawing the die from the work.

25 Other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings forming a part of this specification and in which drawings:

30 Figure 1 is a view in side elevation of the electric die threading tool.

Figure 2 is a side view of the tool with one of the side cover plates removed.

35 Figure 3 is a longitudinal section substantially on line 3—3 of Figure 2.

Figure 4 is a transverse section substantially on line 4—4 of Figure 2.

Figure 5 is an enlarged fragmentary section substantially on line 5—5 of Figure 2.

40 Figure 6 is a fragmentary top plan view showing the gear shifting lever arrangement.

Figure 7 is an enlarged longitudinal section thru the drive member for imparting rotation to the die holder or shell.

45 Figure 8 is a side view on a reduced scale of the die holder shown in Figures 1 and 2 for holding a solid round die.

Figure 9 is a side view of a die holder for holding a solid square die.

50 Referring to the drawings in detail and wherein like reference characters designate corresponding parts thruout the several views, the electric die threader comprises a relatively flat casing A upon one end of which is mounted an electric motor B for imparting rotation to a com-

bined worm wheel and die holder or shell C thru speed reduction gear mechanism D.

The casing A comprises a relatively flat open sided metal frame 10 which preferably tapers slightly at its sides towards one end of the frame as best shown in Figures 3 and 6. At its narrow end, the frame 10 has a circular portion 11 with which is integrally formed a hand grip 12 lying in the plane of the frame. The wider end of the frame 10 forms an end wall 13 which is connected at its upper end with the circular portion 11 by a top wall 14. Formed on the outer side of the end wall 13 is a flange 15 to which a flange of the electric motor B is attached as by bolts or the like 16. Secured as by bolts or the like 16 to a flange at the outer end of the electric motor B is a hand grip 17 lying in the plane of the frame 10.

Closing opposite sides of the open frame 10 is a pair of removable cover plates 18 and 19 which 20 in addition to forming a cover for the gearing D, also provide bearings for the combined worm wheel and die holder C. These removable cover plates 18 and 19 conform in outline to the shape of the open frame 10 and are secured to the frame 25 by means of bolts or screws 20 suitably spaced about the marginal edge of the cover plates and threaded into tapped openings 21 in the frame. The cover plates 18 and 19 are each annularly concaved as at 22 and are provided in these concaved portions with round openings 23 which are slightly spaced apart and axially align when the cover plates are secured in place on the frame 10. These axially aligning openings 23 form 30 radial bearings for the die holder C, while the confronting annular inner surfaces 24 of the cover plates about these openings 23 form axial thrust bearings for the die holder, as will be later described.

Referring now to the combined worm wheel 40 and die holder C, the same is preferably of one-piece construction and includes a tubular sleeve portion 25 provided at one end with an internal stop flange or shoulder 26. Provided on the exterior of and intermediate the ends of the sleeve 45 portion 25 is a worm wheel 27 having parallel opposite side surfaces which have bearing contact with the annular bearing surfaces 24 as shown in Figure 4. The external diameter of the sleeve portion 25 is of a size to have a bearing 50 fit in the openings 23 as will also be apparent from Figure 4. The sleeve portion 25 is adapted to removably receive in one end thereof, a solid round die 28 which may be held in place as by a set screw 29. As will be observed in Figures 3 55

and 4, the recessing or concaving of the cover plates as at 22 not only provides axial and radial bearings for the die holder, but also permits of the sleeve portion 25 being disposed almost completely within the planes of opposite sides of the casing A and ready access being had to the set screw 29.

By removing the cover plate 19, the combined worm wheel and die holder C may be readily removed and a different die holder substituted if desired, such for instance as shown in Figure 9. In Figure 9, the combined worm wheel and die holder C' has its sleeve portion 25' provided with a square opening 30 for receiving a solid square die.

With reference now to the transmission gearing D for imparting rotation in either direction to the die holder C, the shaft 31 of the electric motor B extends thru the lower portion of the end wall 13 of the frame 10 and is journaled in a bearing sleeve 32 preferably formed integral with the frame. Fixed upon the end of the motor shaft 31 at the inner end of the sleeve 32 is a driving gear 33 with which is adapted to constantly mesh, an elongated sliding or shipper pinion 34 slidably and rotatably mounted upon a stub shaft 35 secured at one end in the end wall 13 and extending parallel to the motor shaft 31. Also in constant mesh with the driving gear 33 is an intermediate or reverse drive pinion 36 suitably journaled upon a stub shaft 37 mounted in a boss 38 projecting from the end wall 13. In constant mesh with the intermediate drive pinion 36 is a second elongated sliding or shipper pinion 40 which is slidably and rotatably mounted upon a stub shaft 41 secured at one end in the end wall 13 and extending parallel to the motor shaft 31.

Journaled in the frame 10 just beneath the top wall 14 thereof, on an axis parallel to the motor shaft 31, is a drive shaft 42 having at one end a gear wheel 43 and at its opposite end a worm 44. The gear 43 and worm 44 are preferably formed integral with the shaft as shown in Figure 7. The ends of the shaft 42 are bored as at 45 to receive bearing studs 46 and 47 mounted respectively in bosses 48 and 49 and formed integral with the frame 10. The drive shaft 42 is journaled to extend longitudinally in the upper portion of the casing A above the die holder C, with the worm 44 meshing with the worm wheel 27 and the gear wheel 43 parallel to but slightly offset out of the plane of the driving gear 33.

The constantly but reversely driven sliding pinions 34 and 40 are adapted to be selectively meshed with the driven gear 43 by a gear shifting or shipper means whereby the die holder C may be rotated in one direction during the thread cutting operation and rotated in the opposite direction when withdrawing the die from the work without requiring use of a reversible electric motor. In the example illustrated, the die is rotated in a thread cutting direction by the sliding pinion 34 and in a reverse direction by the sliding pinion 40 with its intermediate gear 36.

This gear shifting means embodies a rock or shipping shaft 50 suitably journaled to extend thru the top wall 14 of the casing frame 10 and having mounted on its outer end a spring steel lever 51 having its free end normally spring urged against the wall 14. Secured to the inner end of the shaft 50 is a shipping bar 52 having slotted ends receiving pins on suitable yokes 53. These yokes 53 are received in annular grooves provided in the ends of the pinions 34 and 40

whereby upon shifting of the bar 52, the pinions will be slid along their respective shafts 35 and 41 into and out of mesh with the gear wheel 43 on the drive shaft 42. Thus, when the shipping bar 52 is shifted in one position as in Figure 3, the constantly driven pinion 34 is meshed with the gear 43 for rotating the die holder in one direction, and when the shipping bar is shifted into the other position, the constantly driven pinion 40 is meshed with the gear 43 for rotating the die holder in the opposite direction.

Provided on the upper side of the frame top wall 14 are spaced apart stop lugs 55 which limit swinging movement of the lever 51, and arranged between these lugs is a shallow rib 56 for retaining the lever in either position of movement, as clearly shown in Figure 6.

Referring particularly to Figures 1 and 6, the upper edge of the cover plate 18 is preferably notched out as at 57 so as to allow for ready oiling of the gearing within the casing. A small notch is also made in this cover plate as at 58 to permit oiling the motor shaft 31 thru an oil duct 59 formed in the frame end wall 13.

A suitable control switch 60 is preferably mounted upon the hand grip 17 for controlling the electric motor B from a source of current delivered thru the conductor 61.

Owing to the novel gearing arrangement and the combination worm wheel and die holder, the casing A, as will be seen, may be made comparatively thin, thus permitting use of the tool in very restricted places.

Changes in detail may be made to the form of the invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A portable thread cutting tool comprising a relatively flat open sided tapering frame, removable side plates, having flat outer faces, closing opposite sides of the frame, a hand grip carried by the narrow end of the frame in the major plane of the frame, a motor mounted upon the wide end of the frame, a hand grip at the outer end of the motor in the major plane of the frame, a die holder journaled in the side plates with its axis of rotation normal to the major plane of the frame and substantially within the flat outer faces of the side plates, drive gearing supported by the frame for imparting rotation to the die holder from said motor, and control means for the drive gearing for controlling the direction of rotation of the die holder.

2. In a portable power driven threading tool, a relatively flat casing including removable side cover plates having recessed portions provided with aligning inwardly offset openings, a die holder journaled in the openings within the planes of opposite sides of the casing and held against axial movement by the side plates, said die holder being removable from the casing upon removal of one of the side plates, and means for securing a die entirely within the die holder.

3. A portable power driven threading tool comprising an open sided tapering frame having a circular portion at its narrow end, an end wall at its opposite broader end, and a top wall, removable cover plates closing the open sides of the frame and having aligning openings co-axial with said circular frame portion, a motor mounted upon the end wall of the frame, a die holder journaled in said openings and held against axial movement by the cover plates, drive gearing supported by the frame for imparting rotation to

the die holder from the motor and including sliding pinions, shipper means extending thru the top wall of the frame adjacent said end wall for controlling the direction of rotation of the die holder thru shifting of said pinions, and a hand grip at each end of the tool.

4. In a portable power driven threading tool, a casing including a frame and removable side cover plates for the frame, a die holder journaled in the cover plates and including a worm wheel, a motor mounted upon one end of the frame and

having a shaft extending into the casing, a drive gear on the motor shaft, a sliding pinion constantly meshing with said gear, an intermediate pinion constantly meshing with said gear, a second sliding pinion constantly meshing with said intermediate gear, a drive shaft journaled in the frame having a worm at one end meshing with said worm wheel and a gear at its other end with which said sliding pinions may mesh, and shipping means for the sliding pinions.

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