C. S. WEYANDT.

ELECTRICAL TOOL.

APPLICATION FILED SEPT. 14, 1920.

1,397,567.

Patented Nov. 22, 1921.

2 SHEETS—SHEET 1.

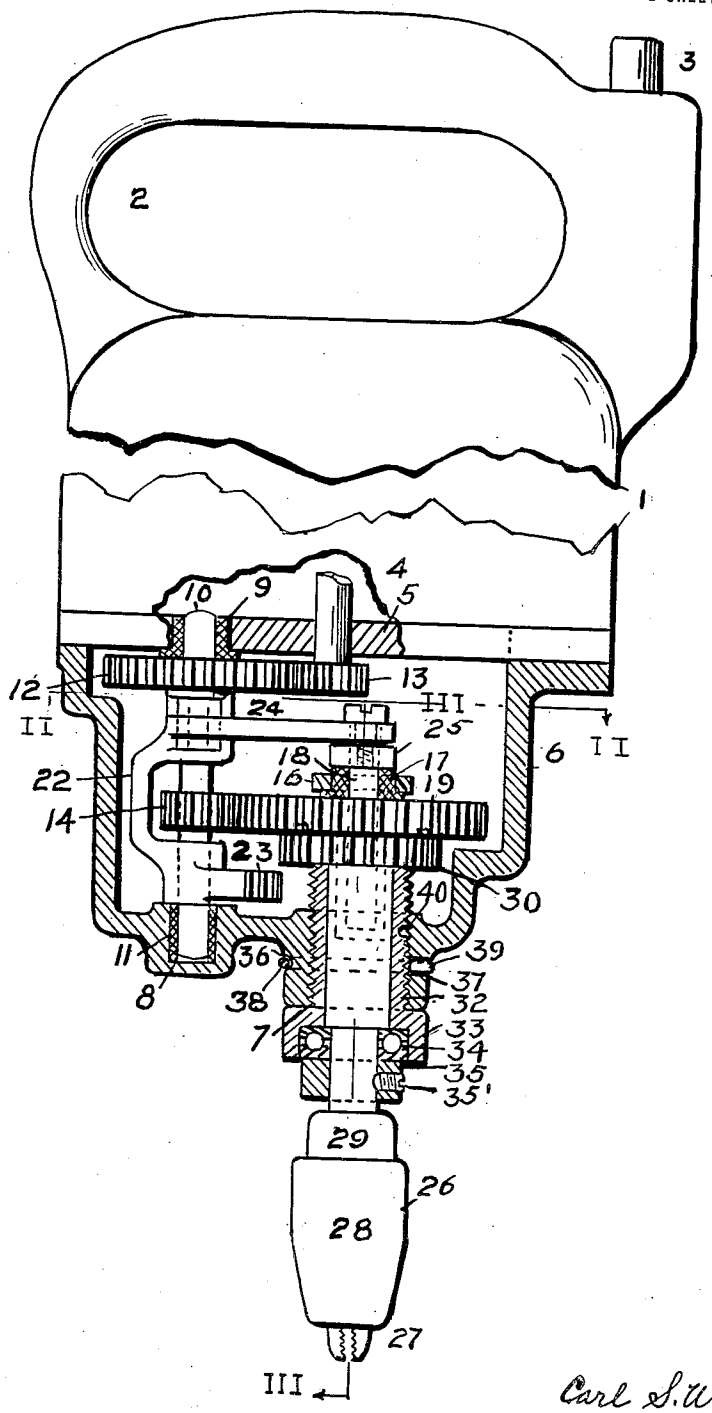


Fig. 1.

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2 SHEETS—SHEET 2.

Fig 2

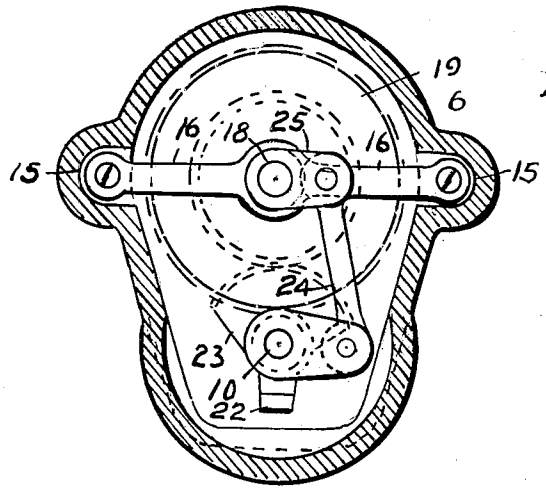


Fig. 3

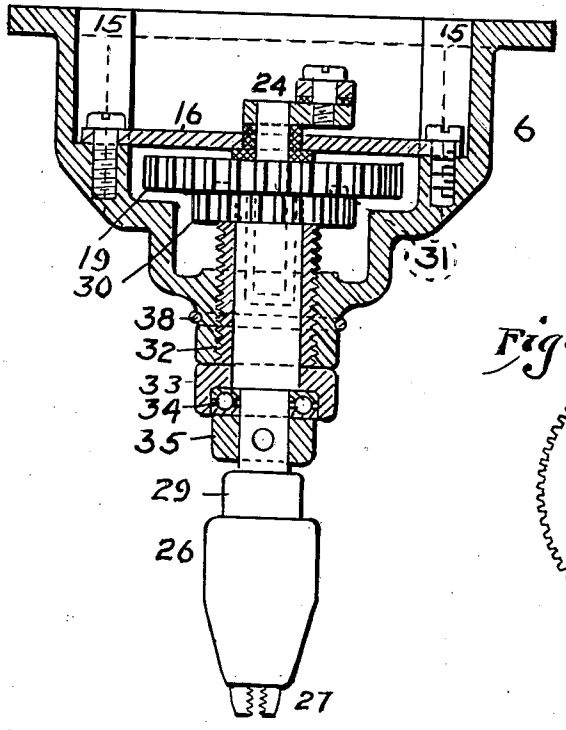


Fig 4

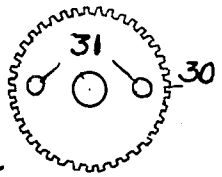
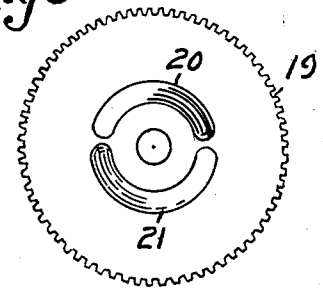


Fig 5



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ELECTRICAL TOOL.

1,397,567. Specification of Letters Patent. Patented Nov. 22, 1921.

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To all whom it may concern:

Be it known that I, CARL S. WEYANDT, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Tools, of which the following is a specification.

This invention relates to an electrical tool, designed primarily as a combined drilling and grinding tool for valves, although it is to be understood that the tool can be employed for any purposes wherein it is found applicable, and the invention has for its object to provide, in a manner as hereinafter set forth, an electrically driven tool having means whereby a continuous rotary drive, which is employed for drilling operations, can be quickly and conveniently changed into an oscillatory drive to be employed for grinding.

Further objects of the invention are to provide an electrical tool for the purpose set forth which is simple in its construction and arrangement, strong, durable, efficient and convenient in its use, compact, readily assembled, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter set forth, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1, is a sectional elevation, partly broken away, of an electric tool in accordance with this invention.

Fig. 2, is a section on line II—II Fig. 1.

Fig. 3, is a section on line III—III Fig. 1.

Figs. 4 and 5 are detail of the driving mechanism.

Referring to the drawings in detail 1 denotes the body portion of the tool which is adapted to inclose an electric motor, not shown. The motor is adapted to be connected to a suitable source of electrical energy by suitable electrical conductors which pass through the handle end 2 of the body portion. The conductors are not shown and have interposed therein a switch or push button 3 located at the handle end 2 of the body portion 1. The motor, not shown, has its shaft 4 project from and is supported by the end 5 of the body portion 1. Attached to and projecting from the body portion 1, at the end 5 thereof, is a casing 6, formed with an opening 7 and a pocket 8. The wall of the opening 7 is threaded and the said opening 7 is arranged above the pocket 8. The opening 7 and pocket 8 are positioned at the outer end of the casing 6.

Mounted in the end 5 of the body portion 1, below the shaft 4, is a bushing 9, which supports one end of a transmission shaft 10. The other end of the shaft 10 is mounted in a bushing 11 positioned in the pocket 8. Fixed to the shaft 10 is a large gear wheel 12, which meshes with and is driven by a pinion 13, carried by the motor shaft 4, whereby on the operation of the motor the shaft 10 will be driven owing to the connection between the gear 12 and pinion 13. The shaft 10 intermediate its ends has fixed thereto a pinion 14 for a purpose to be presently referred to.

The casing 6 has a pair of oppositely disposed offsets 15, in which is fixedly secured the ends of a transversely extending supporting member 16, having mounted therein centrally thereof, a bushing 17 through which extends a shaft 18, which when coupled up with the tool holder, to be presently referred to, will rotate the latter, and which further provides means for actuating the oscillatory drive connection or mechanism for the tool holder. Said mechanism will be presently referred to.

The shaft 18, has fixed therewith a large gear wheel 19, which meshes with and is driven by the pinion 14, when the motor is operated. The gear wheel 19, has one of its faces formed with a pair of oppositely extending curved grooves 20, 21, each of which gradually increases in depth from one end toward the other, and which are employed for coupling up the gear 19 to drive the tool holder in a rotary direction. The gear wheel 19 is fixed to the shaft 18 intermediate the ends thereof.

Mounted on the shaft 10, is a yoked shaped rocker arm 22, which is so disposed as to be positioned at each end of the shaft 10. The forward end of the arm 22, is provided with

a toothed quadrant 23, and its rear end with a crank 24, to which is attached an eccentric 25, carried by the rear end of and driven by the shaft 18, under such conditions imparting an oscillatory movement to the rocker arm 22.

The tool holder 26, includes a stepped stem including an outer portion 27 and an inner portion 28. The stem provides what may be termed a driving shaft for the holder and tool, whether the drive be a rotary or an oscillatory one. The inner portion 28 is formed with a socket 29 into which extends the shaft 18, and further has fixed to its inner end a gear wheel 30, provided with coupling pins 31, which engage in the grooves 20, 21 for coupling the gear wheel 19 to the gear wheel 30; under such conditions the shaft or rather stepped stem of the tool holder will be driven in a rotary manner.

The tool holder is shifted longitudinally for the purpose of coupling it to and uncoupling it from the gear 19, and for this purpose a peripherally threaded sleeve or bushing 32 is provided which has threaded engagement with the threads of the wall of the opening 7. The sleeve 32 has the stepped stem of the tool holder extend therethrough and the said sleeve 32 further abuts against the gear wheel 30. The outer end of the sleeve 32 is formed with an annular flange or collar 33, forming a race for bearing balls 34, which surround the stem of the holder. The balls 34 are maintained in position by a collar 35 which is secured to the stem of the tool holder by the set screw 35'.

The collar 35 not only provides means for retaining the balls 34 in position, but also constitutes an abutment when the sleeve 32 is moved outwardly, as the sleeve abutting against the collar 35 will cause the stem of the tool holder to move outwardly and uncouple the gears 19 and 30. When the gear 30 is shifted clear of the gear 19, it is brought to mesh with the toothed quadrant 23, so that on the operation of the rocker arm an oscillatory movement will be imparted to the tool holder. When the gear 30 is moved clear of the quadrant 23, due to the inward movement of the sleeve 32, it is brought into clutching engagement with the gear 19, and which will cause a rotary movement to be imparted to the tool holder.

The outer face of the casing 6, adjacent the forward end thereof, is formed with a peripheral groove 36 provided with an aperture 37. A spring annulus 38 is positioned in the groove 36 and has one end thereof formed to provide a detent 39 engaging in the aperture 37. To limit the outward movement of the sleeve 32 in the casing 6, the former is provided with a recess 40 which is adapted to be engaged by the detent 39, when the sleeve 32 is moved sufficiently outward to cause the recess 40 to register with the aperture 37 in the sleeve 32.

What I claim is:—

1. A tool for the purpose set forth comprising a tool holder carrying shaft, an electric driving element, an operative drive connection operated thereby and having means detachably connected with the inner end of the shaft for rotating the latter, and means operated from the said connection when said means is detached from the shaft for driving the latter in an oscillatory manner.

2. A tool for the purpose set forth comprising a tool holder carrying shaft, an electric driving element, an operative drive connection permanently connected with said element and having means detachably connected to the inner end of the shaft for rotating the latter when coupled thereto, and means operated from said connection when said means is uncoupled from the shaft for driving the latter in an oscillatory manner.

3. A tool for the purpose set forth comprising a longitudinally shiftable tool holder carrying shaft, a driving mechanism therefor including means detachably engaging with the inner end of said shaft when the latter is at the terminus of its longitudinal movement inwardly for rotating the shaft and further including means detachably engaging with the inner end of the shaft when the latter is shifted outwardly longitudinally to change the rotary movement of the shaft into an oscillatory one, and an electrical drive for said mechanism.

4. A tool for the purpose set forth comprising a tool holder carrying shaft, a rotary driving means therefor adapted to be coupled with the inner end thereof for driving the shaft, means for uncoupling the shaft from said driving means, means operated from the driving means when uncoupled from the shaft and detachably engaging with the inner end of the shaft for operating the latter in an oscillatory manner, and an electrically operated element for driving the said means.

5. An electric drilling and grinding tool comprising a tool holder carrying shaft, an electrically operated driving element, means operated from said element and detachably engaging with the inner end of and driving the tool holder carrying shaft in a rotary manner, and means whereby the rotary drive of the shaft is arrested and the shaft driven in an oscillatory manner, the rotary driving means operated from said element and the oscillatory driving means driven from the rotary driving means.

6. A tool for the purpose set forth comprising a tool holder carrying shaft, an electrically operated driving element, means detachably engaging with the inner end of the

shaft and operated from said element for driving the shaft in a rotary manner, and means whereby the rotary drive of the shaft is arrested and the tool member driven in an oscillatory manner, said oscillatory driving means supported by and driven by said rotary driving means.

7. A tool for the purpose set forth comprising a tool holder carrying shaft capable of being rotated or oscillated, a gear on the inner end of the shaft, means detachably connected with the gear for imparting a rotary drive to the shaft, and means adapted to mesh with the gear when the rotary driving means is disconnected therefrom to oscillate the shaft.

8. A tool for the purpose set forth comprising a pair of driven shafts operated from a driving element and operatively connected together, a tool holder carrying shaft provided with a gear, means carried by one of the driven shafts and detachably connected with the gear for rotating the tool holder carrying shaft, and means carried by the other driven shaft and meshing with said gear for oscillating the tool holder carrying shaft when the rotary operating means for the latter has been disconnected therefrom.

9. A tool for the purpose set forth comprising a longitudinally shiftable tool holder carrying shaft, means detachably engaging with the inner end of the shaft for rotating it, and means detachably engaging with the inner end of the shaft for oscillating it when said rotating means is disconnected from the shaft and the latter is shifted longitudinally in one direction.

10. A tool for the purpose set forth comprising a holder having as a permanent part thereof a stem constituting a shaft for driving it, means adapted to be coupled with the stem for driving it in a rotary direction, and means engaging with the stem when the rotary driving means is uncoupled for driving the stem in an oscillatory manner, said oscillatory driving means carried by and operated by the rotary driving means, and an electrically operated element for actuating the rotary driving means.

In testimony whereof I affix my signature.

CARL S. WEYANDT.