May 1, 1934. A GRESS 1,956,740

MOTOR DRILL

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FIG. 1.

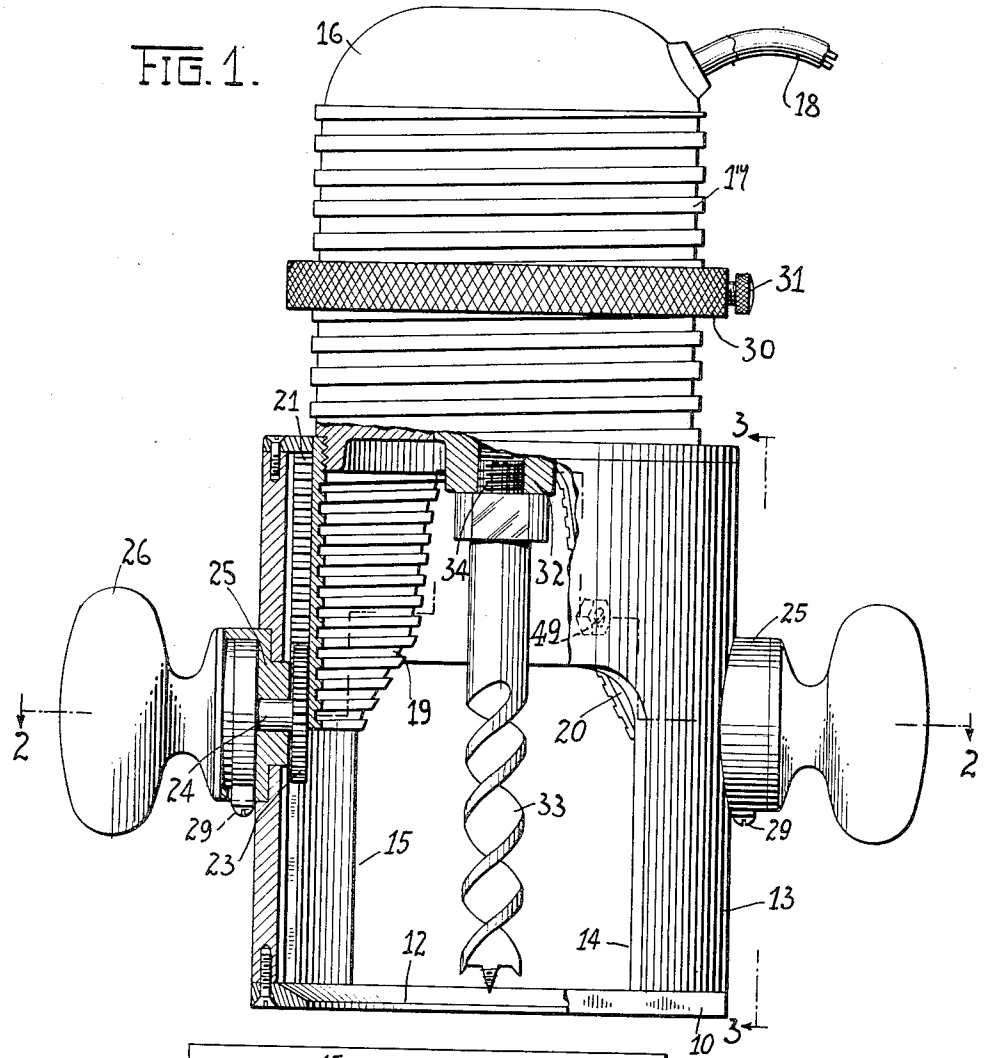
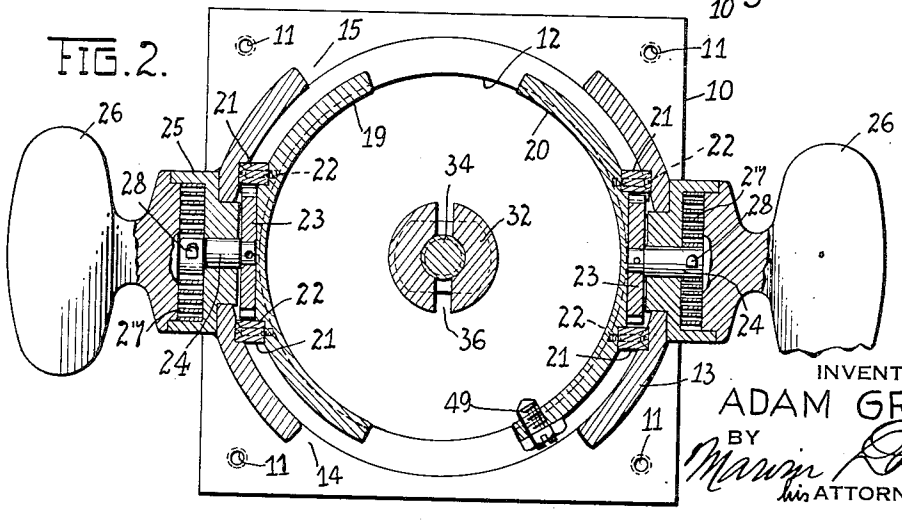


FIG. 2.



INVENTOR
ADAM GRESS
BY
Marvin Ralmp
his ATTORNEY

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MOTOR DRILL

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FIG. 3.

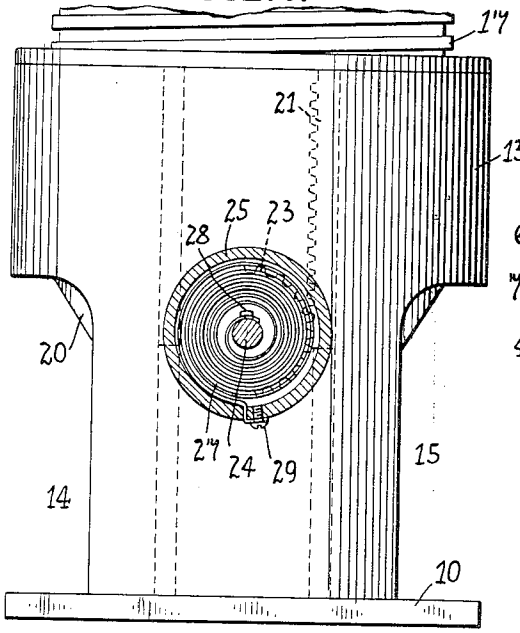
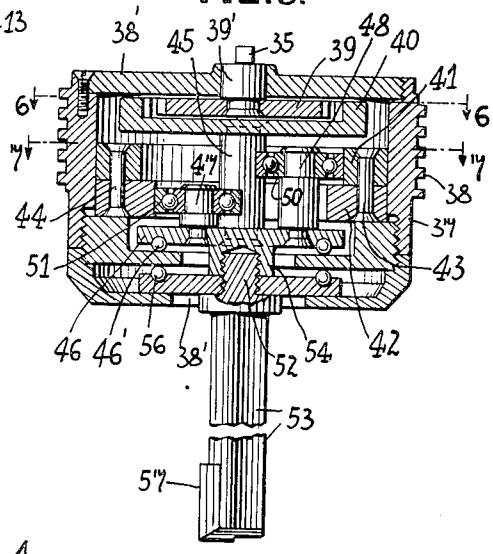


FIG. 5.



5 FIG. 4.

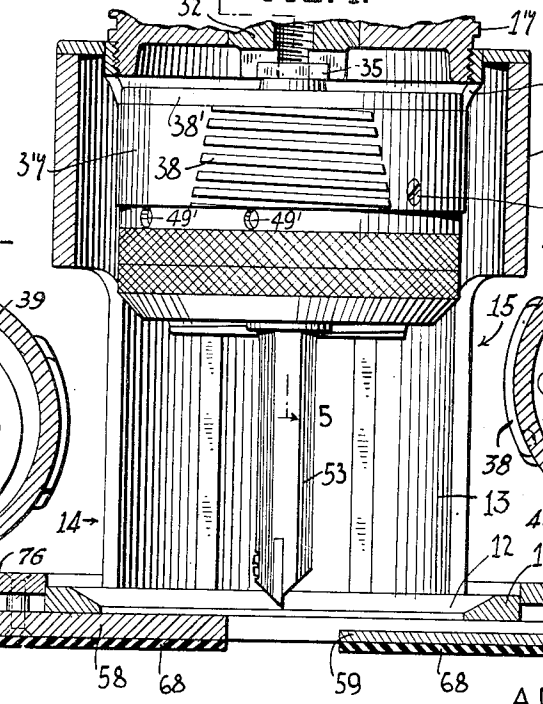


FIG. 6.

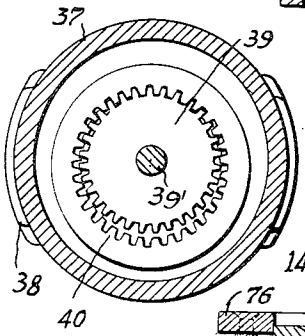
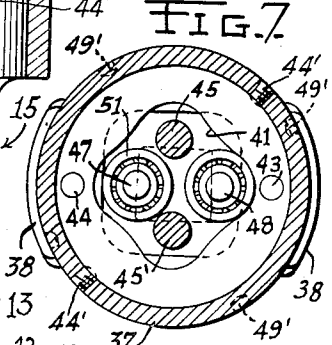


FIG. 7.



INVENTOR
ADAM GRESS
BY
his ATTORNEY

Patented May 1, 1934 1,956,740

UNITED STATES PATENT OFFICE

1,956,740

MOTOR DRILL

Adam Gress, New York, N. Y.

Application June 2, 1932, Serial No. 614,955

2 Claims. (Cl. 77—61)

This invention relates to improvements in apparatus for drilling or cutting square holes in work-pieces of any kind of material, and it is an object of my invention to provide a motor casing which, by means of spring controlled handles, may be vertically reciprocated in order to determine the depth of drilling operation, and which is equipped with means to exchangeably hold the tool to the motor casing.

Another object of my invention is the provision of a chuck adapted to be attached to the motor casing, the tool of which is operated by the intermediary of suitable cams to guide the tool in the work piece for cutting square holes in the material.

Still another object of my invention is the provision of a chuck for motor operated drills carrying the tool in such manner that, by the exchange of cams, holes of any outline may be cut into the material.

These and other objects and advantages of my invention will appear as the description thereof proceeds, and will then be specifically defined in the appended claims.

In the accompanying drawings, forming a material part of this disclosure:

Fig. 1 is a front elevation of a square hole drilling machine constructed according to my invention, parts being broken away to show the construction.

Fig. 2 is a cross-sectional view on line 2—2 of Figure 1.

Fig. 3 is a partial side elevational view of the machine seen in the direction of arrows 3—3 of Figure 1, with handles removed.

Fig. 4 is a partial longitudinal sectional view of the cutter with a chuck for tools to drill a square hole.

Fig. 5 is a longitudinal sectional view on line 5—5 of Figure 4.

Fig. 6 is a cross-sectional view on line 6—6 of Figure 5.

Fig. 7 is a cross-sectional view on line 7—7 of Figure 5.

As illustrated, the apparatus comprises a base 10 provided with openings 11 for fastening means to secure the machine to a support, and having a central opening 12.

The base carries a housing 13 with front and rear openings 14, 15 in its lower part.

The housing is preferably circular in cross-section and is adapted to receive an adjustable motor casing 16 having its outer wall threaded, as at 17, and is connected by a conducting cable 18, to a source of electricity to operate the motor within the housing.

The lower part of the motor casing has two depending members 19, 20 on the arc of a circle provided with inner threads for a purpose hereinafter described.

Rack bars 21 are secured by screws 22 to the parts 19 and 20 and are engaged by gears 23 at the ends of spindles 24 within two part sockets 25 in which springs 27 are secured at one of their ends to the spindles 24 and their other ends to screws 28—29 in the walls of the sockets.

A ring 30 fitting the outer thread 17, is locked in any of its adjusted positions by a set screw 31 for limiting the downward movement of the motor casing and the tools connected thereto to determine the depth of the drilling operation.

The motor casing 16 has in its bottom part a socket 32 into which the threaded nipple 34 of a tool 33, for instance an auger, engages.

If a drill is to be used, having at its upper end a nipple 35, the same is engaged in the slot 36 of the socket 32, while the casing of the drill chuck 37 is provided with screw threads 38 adapted to engage the inner threads of parts 19 and 20, so as to be firmly held in casing 13.

The chuck 37 is equipped with an outer thread as described, and has an upper closed cover 38', and its bottom is provided with a centrally located opening. Within the chuck a gear 39 is arranged on a spindle 39' engaging an internal gear 40. Below the gear 40 the stationary cams 41, 42 are held together by rivets 43, 44, while cam 41 is secured to the chuck by means of screws 44'. Spindles 45, 45' carry a disc 46 rotating on ball bearings 46'. The disc carries posts 47 and 48, and post 48 carries a ball bearing 50 running in cam 41, while post 47 carries a ball bearing 51 running in cam 42.

The nipple 52 of the tool spindle 53 is screwed into a hub 54 on the disc 46 running on ball bearing 56. The lower end of the tool spindle carries the cutter or router 57. By loosening the screw 49, the chuck can be turned about 90° relative to the casing 16.

In operation, the chuck is screwed into the motor casing, the depth to which the work-piece is to be drilled is determined by the depression of the motor, by means of the handles compressing the inner springs, and is then fixed by securing the ring 30 in place by set screw 31. The motor is then started and, according to the arrangement of the cams, the tool is guided, following the same as their radii are equal to the radii of the ball bearings, compelling the tool to follow a square

outline as indicated in Figure 7. If more than one square hole is to be drilled, the machine is correspondingly moved.

It will be clear that the chuck may be readily unscrewed and removed from the arcuate parts 19, 20, and an auger or like tool may be attached in socket 32.

It will be understood that I have described and shown the preferred form of my invention as an example only of the many possible ways to practically construct the same and that I may make such changes in its construction, as come within the scope of the appended claims, without departure from the spirit of my invention.

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

1. In a portable apparatus for producing polygonal openings, a housing having opposed rotatable knobs by which it is manipulated, springs to rotate said knobs in one direction, gears on the inner ends of said knobs, a casing movable longitudinally in said housing, racks on said casing meshed with said gears, an electric motor in said casing, a tool holder actuated by said motor, a floating internal gear in said casing, an axial spindle in said casing driven by the motor, a spur gear on the spindle meshed with said spur gear, a pair of studs fixed in opposed relation to said spur gear, a disc on the opposite end of said studs, said disc being rotatable thereby and having a tool receiving socket, a second pair of studs on said disc, said second studs being relatively long and short, radial ball bearings on the opposite ends of the second pairs of studs arranged in different planes and upper and lower internal cams fixed in said casing in engagement with said ball bearings, said cams being fixed in the casing to cause lateral movement of the disc during rotation thereof whereby a polygonal bore is cut.

2. In a manually controlled apparatus for producing polygonal openings, a housing, a compartmented casing slidable therein, means for moving said casing relative to the housing, means to limit such movement in one direction, a motor mounted in one compartment of said casing, said motor driving a spindle in another compartment, a spur gear fixed on said spindle, an internal gear meshed with the spindle driven gear, said internal gear being free to move in a lateral plane, a floating disc in the opposite end of said casing, rigid connections between said gear and disc whereby they are caused to move in unison, a tool holder combined with said disc having a tool extending therefrom outwardly of said casing, studs set in said disc on the side adjacent said gear, said studs varying in length, internal cams fixed in said casing in planes corresponding to the inner ends of said studs, and anti-friction rolls on said studs to engage said cams, said cams being fixed in the casing to cause lateral movement of the disc during rotation thereof whereby a polygonal bore is cut.

ADAM GRESS.