

Feb. 22, 1944.

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2,342,601

DRILLING MACHINE FOR CONCRETE

Filed Nov. 16, 1942

2 Sheets-Sheet 1

Fig. 1

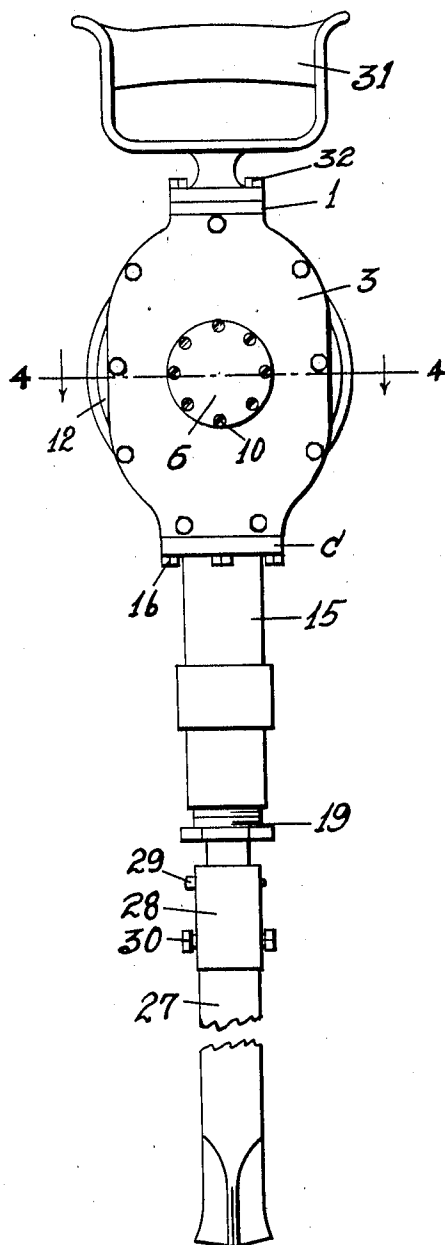
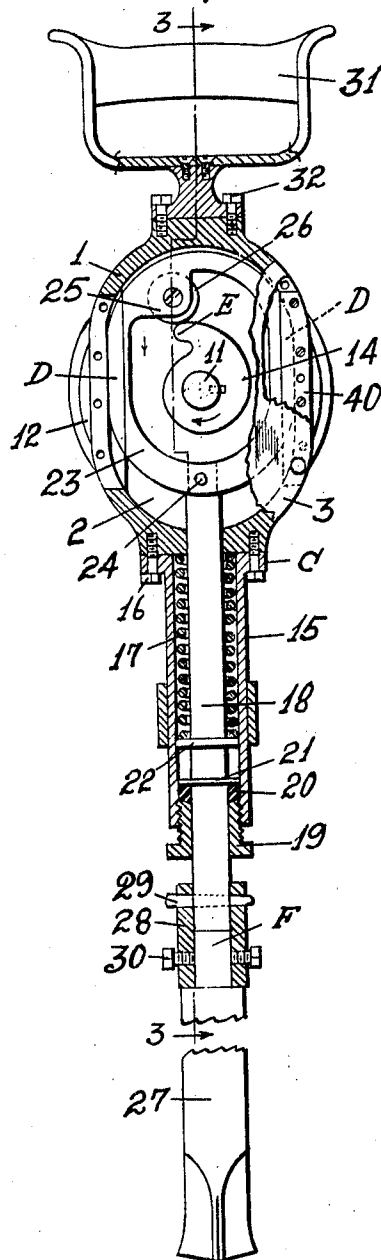


Fig. 2



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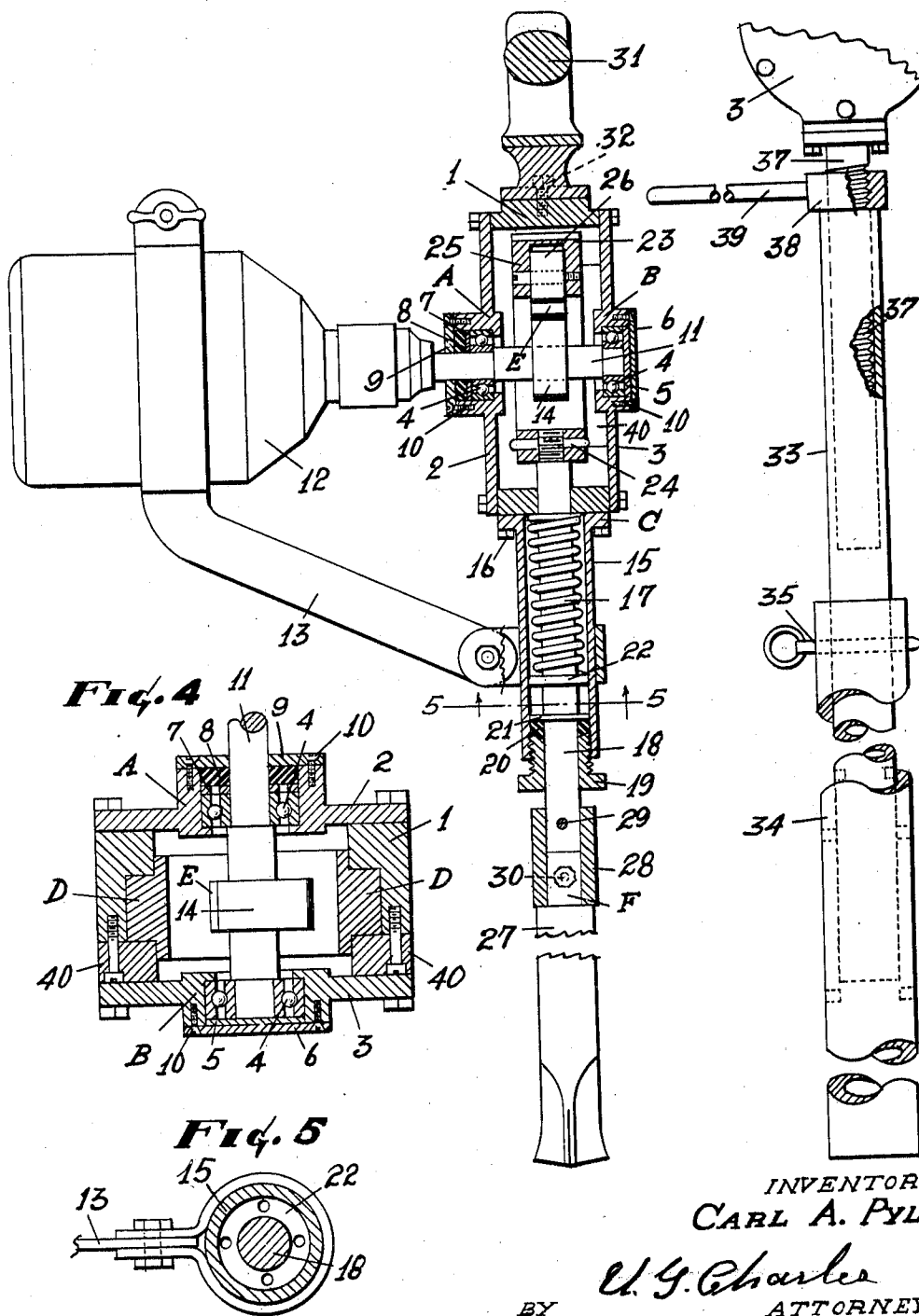
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Fig. 3

Fig. 6



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DRILLING MACHINE FOR CONCRETE

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1 Claim. (Cl. 125—33)

This invention relates to a drilling machine for concrete, and has for its principal object a spring to actuate a stroke of a drilling tool carried by the machine, said spring to accommodate for varying lengths of strokes of the tool, the length of stroke being governed by varying texture of concrete along the path being drilled; otherwise the machine would rebound under direct action of power from a motor upon the tool should resistance of the tool be too great.

A further object of this invention is the simplicity of construction and operation of the machine, whether it be operated on a horizontal or vertical plane, and furthermore the machine has an electric motor secured thereto as power means to operate its drilling tool by compressing and releasing its spring for rapid reciprocation of the tool longitudinally.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawings forming a part of this specification, and in which like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a side elevation of the machine.

Fig. 2 is a longitudinal section of the machine.

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

Fig. 4 is an enlarged cross section taken on line 4—4 in Fig. 1.

Fig. 5 is an enlarged cross section taken on line 5—5 in Fig. 3.

Fig. 6 is a fragmentary view of the machine mounted on an extendable support, the latter partly in section and other parts removed for convenience of illustration.

The invention as herein disclosed consists of a frame 1, elliptical in form, preferred, the sides of which are enclosed by plates 2 and 3, said plates having hubs A and B respectively, the hubs being axially bored for ball bearings 4 mounted therein.

It will be seen that hub B has a circular disc 5 as an enclosure for the outer end of its respective bearing, and a cap 6 to cover the plate and secured oil tight to its hub. The hub A of the other plate has an annular washer 7 seating on the outer end of the bearing and being plurally apertured therearound. Seated on the washer is a packing 8 as an oil tight means for a journal 50 later described, and the said hub being oil tight sealed by an apertured cap 9 secured to the hub, and each of said caps being secured to its respective hub by a plurality of screws 10 spaced therearound.

It will now be seen that the elliptical frame and plates for each side thereof forms a casing for lubricant.

Journalled in the bearings is a shaft 11 that is connected to an electric motor 12 axial therewith, the motor being supported by a brace 13 secured thereto and to said drilling machine.

The portion of the shaft extending through the casing has a cam 14 eccentrically secured thereto and rotatable therewith, the function of which is later described.

Secured to the lower end of the oil casing is a hollow cylindrical element 15 as a barrel, the upper end of which has an annular flange C outwardly extending, seating on the casing and being secured oil tight by cap screws 16 spaced therearound.

Positioned in the barrel is a spring 17 through which extends a plunger 18 that is adapted for reciprocating movement longitudinally of the plunger. Said barrel at its lower extremity has a packing gland 19 threadedly engaging therein as compressing means for a packing 20 that seats on an annular washer 21 that is secured to the inner side of the barrel, through which the plunger slidably engages. The said oil casing is bored at its lower extremity in axial registry with the hollow of the barrel but of a lesser diameter, whereby a shoulder is formed, on which the upper end of the spring will seat, the lower end of the spring seating on an element 22 that is axially bored and being secured to the plunger, whereby said plunger is tensioned outward by the expansion of the spring, and the said element 22 has a plurality of apertures therethrough and spaced therearound to provide for circulation of oil to said gland and its packing element as a suitable lubricating means for the plunger where it extends through the gland.

The said plunger has a head 23 removably secured to the upper end of the plunger by threaded engagement and a pin 24 to lock the same against rotation, said head being oblong and having an opening therethrough of sufficient size to permit rotation of said cam.

Positioned in the opening of the head at its upper extremity is a pair of ears 25 integral with the head and between which is positioned a roller 26 journalled in the ears and upon which the cam will act to move the plunger inward repeatedly, the head having a pair of tongues D oppositely disposed thereon and adapted to slidably engage in their respective grooves in the said elliptical frame as shown in Fig. 4.

It will be seen that the cam at its eccentric ex-

tension terminates as at E whereby an offset in the cam is formed to permit an instant rebound of the plunger as tensioned by its spring for repeated strokes for the drill bit 27 as the shaft turns. It will be understood that the drill bits of different diameters may be secured to the outer end of the plunger by a coupling 28, the adjacent end of which is attached to the shaft by a key 29 diametrically passing therethrough, the shank F of the drill bit being secured by a pair of set screws 30 oppositely disposed, said set screws merely to retain the bit to the plunger but not to resist the force of stroke as said bit snugly engages with the end of the plunger.

Positioned on the upper end of the oil casing is a handle 31, removably secured by cap screws 32 as shown in Figs. 1 and 2. Said handle being removable is means to substitute therefor a carrying shaft which is a convenient supporting means for overhead drilling, said shaft comprising a pair of members 33 and 34 telescopically engaging and being stationarily secured by a pin 35 diametrically passing through the interlapping portions as shown in Fig. 6. It will also be seen that a short length of shaft 37 is secured to the oil casing where the handle is removed, said shaft being threaded and telescopically engaging in the upper member of the support. To raise and lower the machine as carried by the support there is provided a threaded collar 38 to engage on the shaft, the collar having a radially extending handle 39 to turn the same, the arrangement of which is to advance the machine as the hole is drilled.

To remove the head from the oil casing, plate 3 is removed and likewise blocks 40 oppositely dis-

posed in the frame and being one side of the groove, and as shown in Figs. 2 and 4, whereby the groove is opened at one side to free the head for side movement from the casing, it being understood that the plunger is first removed from the head.

Such modifications may be made as lie within the scope of the appended claim.

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

In a drilling machine for concrete, a casing comprised of a frame elliptical in contour whereby a major and minor axis is established and the said frame having an opening therethrough, and heads to close the same oil tight, said frame having a pair of grooves internally and oppositely disposed and being in parallelism with each other and with the major axis of the frame, the corresponding sides of the grooves being removably secured as accessible means into the casing and a motor-driven shaft journaled in the casing and having a cam secured thereto and being positioned in the casing, a head having an opening therethrough and a pair of tongues externally of the head and oppositely positioned thereon in parallelism to engage in the grooves, a roller journaled to operate in the opening of the head and being engaged by the cam to move the head in one direction, there being a spring to move the head in the other direction at the instant of the cams disengagement with the roller, and the said head having a drilling bit and means to connect the same to the head.

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