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F. SEIBEL
MOTOR-DRIVEN CHAIN SAWS
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Fig. 1

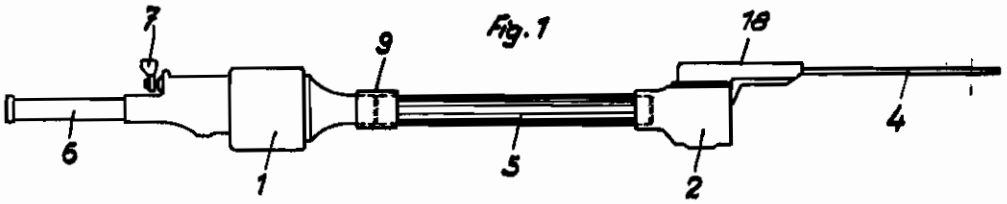

Fig. 2

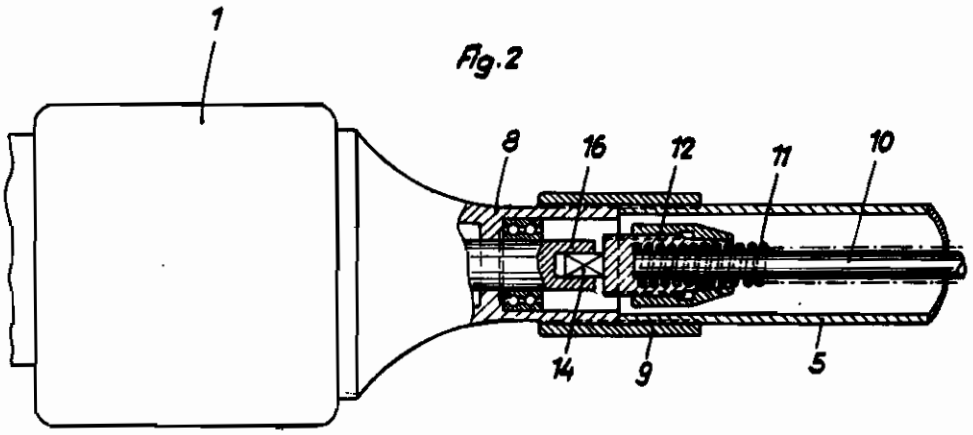

Fig. 3

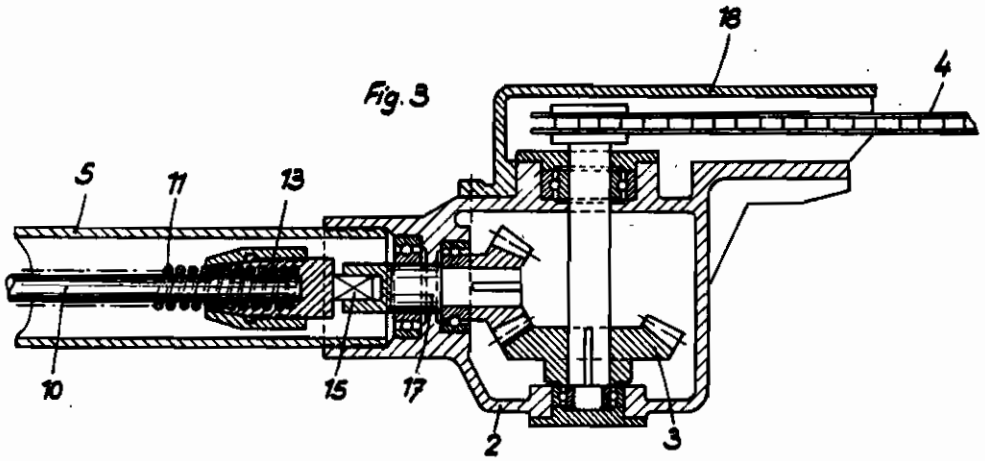

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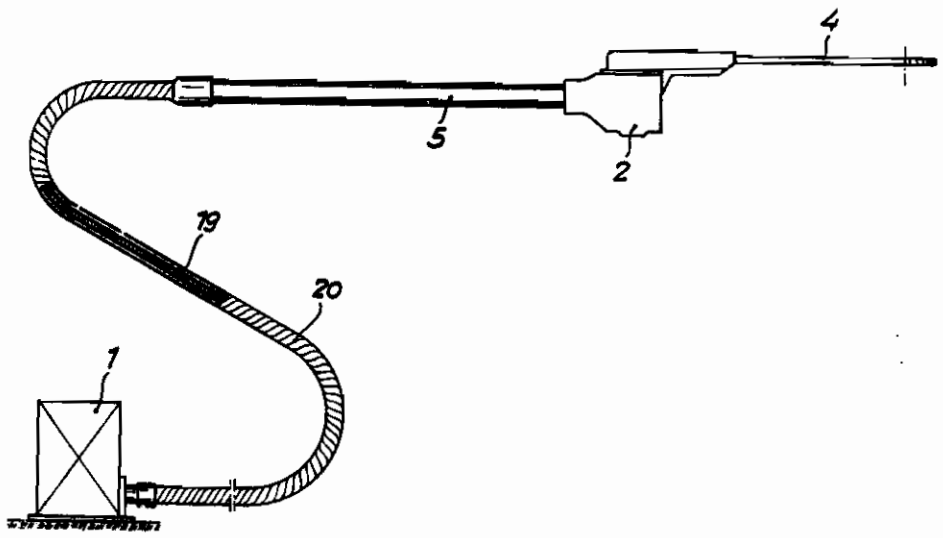
Fig. 4



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ALIEN PROPERTY CUSTODIAN

MOTOR-DRIVEN CHAIN SAWS

Fritz Seibel, Essen-Ruhr, Germany; vested in the Alien Property Custodian

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The invention relates to motor driven chain saws for wood cutting, for example for using in felling trees, cutting mine props and the like, the motor being generally an electromotor, compressed air motor, or internal combustion motor. It is a common practice in connection with such saws to have a gear box rigidly fixed to the frame carrying the saw, the box being either permanently or detachably fixed, and a stub axle projecting from the gear box being coupled with end of the motor shaft, which projects from a motor casing having a handle or handles for manipulating the saw.

According to my invention there is interposed, between the gear box and the motor, a smooth, detachable tube enclosing a transmission shaft and adapted to serve as a handle, sometimes as a handle additional to a handle on the motor casing. The tube is preferably approximately in line with the saw and is very conveniently placed for supporting the weight of the saw frame. If the motor is fixed to the tube and also has a handle the user can grasp that handle with one hand and the tube with the other. As the tube is more or less centrally placed practically all the weight can be supported by the hand grasping it, the other hand being merely used for guiding the saw. For making an inclined cut a twist is given to the handle on the motor casing, and the tube rotates in the hand holding it.

The tube may be so coupled with the gear box that it can easily be disconnected, together with the transmission shaft inside it, in order to enable a tube and shaft of a different length to be substituted. Thus for example an exceptionally long tube may be substituted for one of moderate length in order to enable the user to stand at a considerable distance from the work, thus avoiding risk of accident.

The transmission shaft within the tube may with advantage be composed of a helical spring coiled upon a rod or tube and coupled at its ends with the driving shaft and the gear in the gear box. The coiled spring transmits the drive, and the rod supports it and keeps it straight. This elastic drive is very useful in cases where the motor is stopped through some accident such as the binding of the saw. With a shaft incapable of much torsion it may then be difficult to re-start the motor, whereas there is no such difficulty with the helical spring. The use of this spring makes it in fact possible to use a motor of substantially less power than would be necessary with a rigid shaft, because it is not necessary to have so much margin of power for starting under load. The spindle on which the spring is coiled may with advantage be elastically compressible, or have an elastic sheath, e. g. of india rubber, so that it yields somewhat when the diameter of the helix is substantially reduced by torsion, as when starting the motor. The spindle may for example be a longitudinally slotted steel tube.

The transmission shaft in the tube may be coupled with a flexible shaft connecting it to the motor shaft, as for example where it is desirable to place the motor at a substantial distance from the work, or where it is necessary to use the saw under water.

Two embodiments of the invention are shown in the accompanying drawing, in Figs. 1 to 3 and in Fig. 4 respectively.

Fig. 1 is an elevation of the apparatus, and

Fig. 2 a sectional view, to a larger scale, showing the coupling between the motor shaft and the transmission shaft.

Fig. 3 is likewise a sectional view, to the same scale as Fig. 2, showing the coupling between the transmission shaft and the gear in the gear box.

Fig. 4 is an elevation, partly in section, showing an embodiment with a flexible transmission shaft.

Referring first to the construction shown in Figs. 1 to 3, 1 is the motor, 2 the gear box, 3 the bevel gearing in the gear box, and 4 the chain saw. The motor may be a compressed air motor, for example of the rotary piston type. The motor casing is connected to the gear box by a rigid, straight and smooth tube 5 enclosing the transmission shaft. There is a handle 6 fixed to the motor casing, with the compressed air supply valve 7 close thereto.

For connection with the tube 5 the motor casing has a tubular neck 8, and a screw threaded sleeve 9 couples the sleeve with this neck. At the opposite end the tube 5 is screwed into a tubular boss on the gear box 2. The tube 5 can, accordingly, easily be disconnected from the gear box and the motor if desired.

For transmitting the drive from the motor to the gearing 3 there is within the tube 5 a tubular spindle 10 with a helical spring 11 coiled thereon. The ends of the spring are screwed into sockets 12 and 13 respectively, and these sockets have tongues 14 and 15 respectively. The tongue 14 engages into a slot in the end 16 of the motor shaft, and the tongue 15 engages into a slot in the short shaft of one of the bevel gears.

It will be clear that the tube 5 with the spindle 10 and spring 11 can be disconnected quite easily from the motor and gear box, in order to substitute a tube, spindle and spring of a different length, the change requiring no more than a few minutes.

In the embodiment shown in Fig. 4 an internal combustion motor 1 is connected by a flexible shaft 19 to one end of the transmission shaft in the tube 5. The transmission shaft is similar to that described with reference to Figs. 2 and 3, and the coupling between it and the flexible shaft is likewise similar. The flexible shaft which may be of any desired length, is within a flexible metal sheath 20, which does not rotate with it and is detachably connected to the motor casing and the tube 5.

FRITZ SEIBEL.