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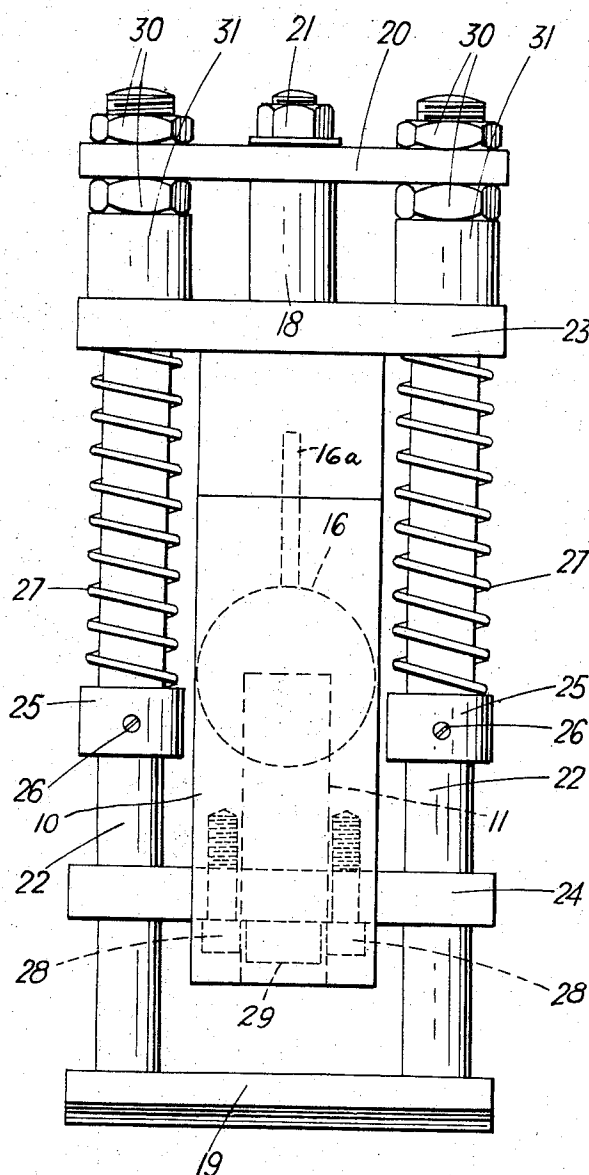
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TOOL FOR INJECTING MATERIALS INTO WOOD

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3 Sheets-Sheet 1

*Fig. 1.*



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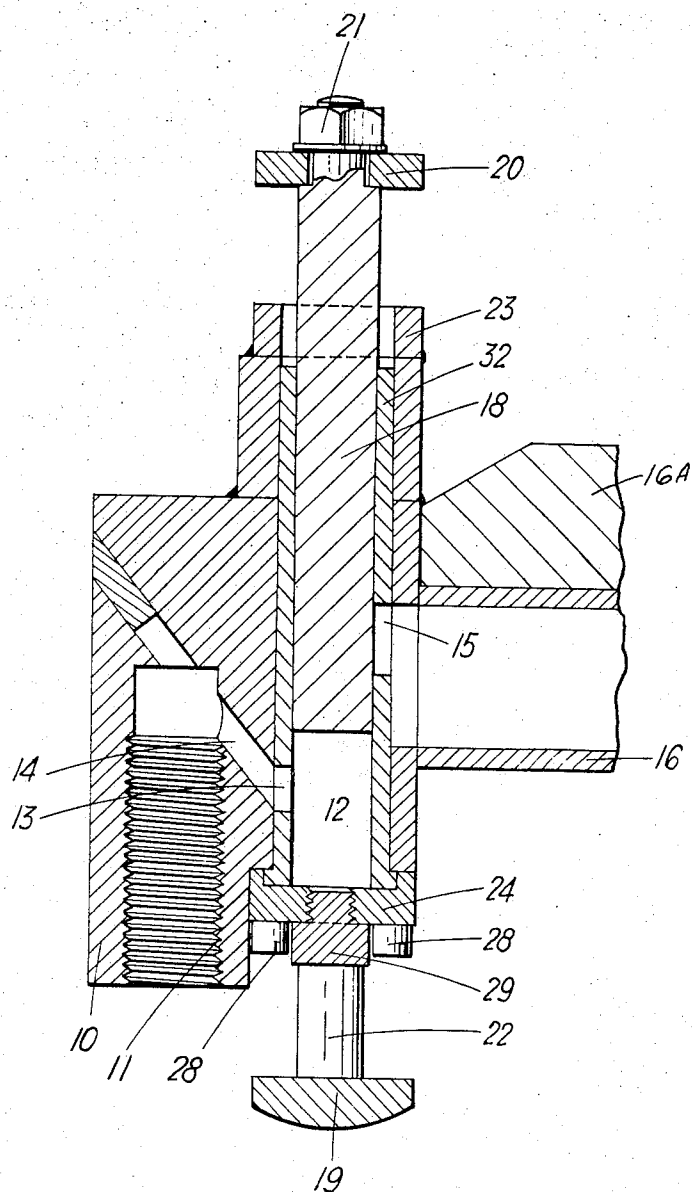
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*Fig. 2.*



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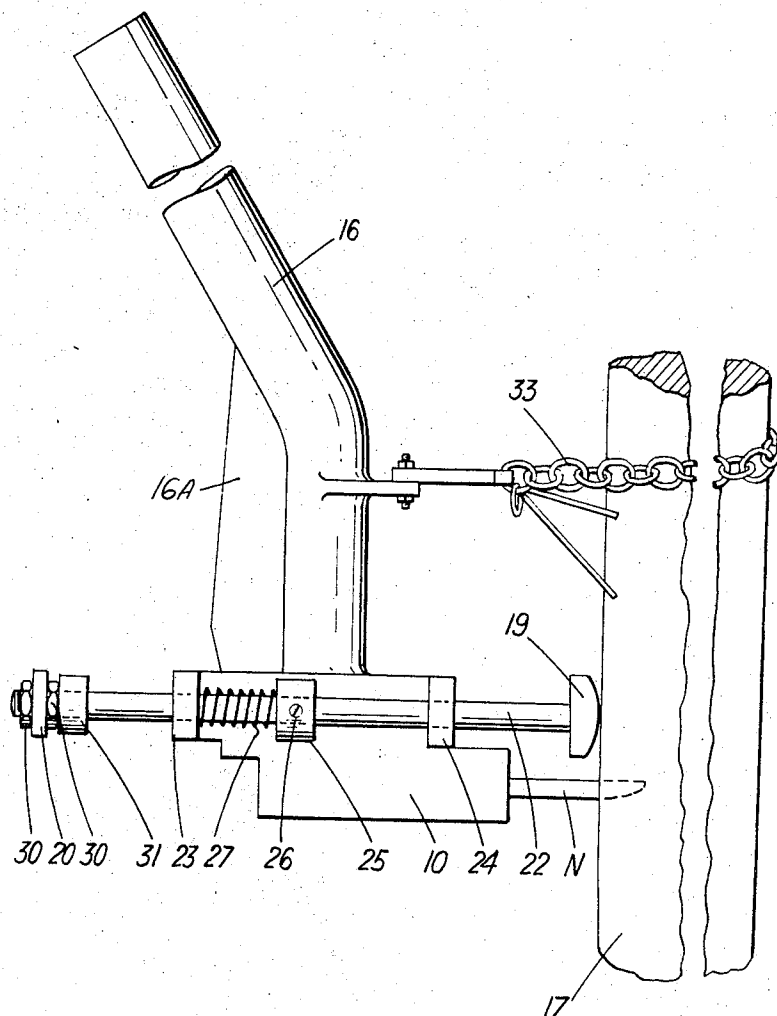
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Fig. 3.



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## TOOL FOR INJECTING MATERIALS INTO WOOD

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3 Claims. (Cl. 21—73)

### ABSTRACT OF THE DISCLOSURE

An injection head, for injecting substances into wood through a needle upon needle withdrawal, has a presser bar at the needle end of the head that engages the wood to force back the piston of the cylinder from which the substance is fed to the needle. The piston projects from the cylinder end remote from the needle, and two posts, one on each side of the head, are secured to opposite ends of the presser bar, and are slidably mounted on the head. A cross bar is removably secured to the projecting end of the piston and to the ends of the posts remote from the presser bar. There are cross members on opposite ends of the head that slidably mount the posts, a collar slidably adjustable on each of the posts between the cross members, and a compression spring on each of the posts and acting between the collars and the cross member which is at the end of the cylinder remote from the needle. Each collar can be secured to its post in an adjusted position to vary the tension of the spring.

This invention relates to tools for injecting substances into wood.

The substance to be injected is usually a liquid or various antiseptic products but may be a colouring or fire-proofing substance and the tool is used for injecting, for example, wooden poles or trees.

Such tools consist generally of an injection head having a needle (or needles) which is forced into the wood by a levering action of the tool and has passages through which, as the needle is injected, the substance is forced into the wood by the movement of a piston in a cylinder fed from a reservoir.

According to the present invention I provide an injection head for a tool for injecting substances into wood comprising a needle-holder, a cylinder having an inlet port for the substance and an outlet port communicating with said holder, a piston in said cylinder closing said inlet port, and a presser member connected to said piston adapted to engage the wood when the tool is in use and to move the piston by pressure against the wood so that said inlet port opens and the cylinder is charged with the substance only when the needle has been injected into the wood to the desired depth, and means for effecting the return stroke of the piston so as to eject the substance from the cylinder through the needle into the wood as the needle is being withdrawn from the wood.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIG. 1 is an inverted plan view of an injection head according to the present invention,

FIG. 2 is a sectional view on the longitudinal medial plane of FIG. 1, and

FIG. 3 is a side elevation of a tool incorporating an injection head according to the invention, in use and to a reduced scale.

Referring to the drawing, an injection head for a tool

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for injecting substances into wood, say a pole, consists of a needle holder 10 having a tapped bore 11 into which one end of a needle N (FIG. 3) is screwed. The holder 10 is connected to or forms part of a cylinder 12 having an outlet port 13 connected by a passage 14 to the bore 11 of the holder 10 and having an inlet port 15 for the substance from a reservoir in a handle 16 connected to the cylinder 12. In use, as shown in FIG. 3, the cylinder 12 is substantially horizontal so that the inlet port 15 is uppermost and the outlet port 13 is lowermost and the latter lies nearer a pole 17 to be injected than the inlet port 15. Within the cylinder there is a piston 18 which is spring-loaded, as later described, so as to urge the piston to a position in which it closes the inlet port 15, that is to say, to a contracted position. The piston 18 at its end remote from the needle N projects out of the cylinder 12 and has a connection with a presser member 19 at the needle end of the head. Said connection consists of a cross bar 20 secured centrally and releasably, for example by a nut 21 and threaded end piece on the piston 18, and is connected adjacent each of its ends to one end of posts 22 extending parallel to the cylinder 12 and connected at their other ends to the presser member 19 which is in the form of a cross bar having its outer face curved. The posts 22 are slidably guided in cross members 23, 24 fixed to opposite ends of the cylinder 12 and intermediate the cross members 23, 24, each post 22 has a slidably adjustable collar 25 fixed thereto by a set screw 26 and a compression spring 27 which at opposite ends abuts said collar 25 and the cross member 23 nearer the projecting end of the piston. Adjustment of the collars 25 enables adjustment of the tension of the springs 27. The springs 27 then urge the piston 18 in the direction of the needle N to its contracted position so that the presser member 19 lies spaced between the outer end of the needle N and the outer end of the needle holder 10. The cross member 24 which is nearer the needle N is removably attached to the head by screws 28 and acts also to close the adjacent end of the cylinder 12 and carries a limit stop 29 for said presser member 19. The ends of the posts 22 are connected to the cross bar 20 as follows. Each post 22 has a screw-threaded end which passes through a hole in the cross bar 20 and is held by a nut 30 on each side of the cross bar 20. Between each inner nut 30 there is a sleeve 31 on the post 22 which acts to limit the movement of the piston 18 to its contracted position. The sleeves 31 can be replaced by other sleeves of different lengths so as to vary the return stroke of the piston 18, and thus the quantity of substance forced through the needle N. A liner 32 is provided between the piston 18 and cylinder 12.

In use, the point of the needle N is placed against the pole 17 and is inserted into the pole 17 by a levering action on the handle 16 which is connected by a chain 33 to the pole 17 above the head to provide a fulcrum. As the needle N penetrates into the pole 17, the presser member 19 abuts the pole 17 and is depressed causing the piston 18 to be extended. When the needle N has been inserted into the pole 17 to the required depth, the piston 18 has moved a predetermined distance to uncover the inlet port 15 more or less, as required. No injection of substance thus takes place during insertion of the needle N.

The tool is then operated to withdraw the needle N, and, as this takes place, the pressure of the presser member 19 against the pole 17 decreases and the piston 18 is urged inwards by the springs 27 causing the substance to be injected through the needle N into the pole 17, and the inlet port 15 to be closed again.

Thus, as the substance is injected only after the needle N has been fully inserted into the pole 17 and as the needle N is being withdrawn, the full charge of the sub-

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stance remains in the hole until it is absorbed by the surrounding wood.

In the drawings, the numeral 16A indicates a supporting web for the handle 16.

I claim:

1. An injection head for a tool for injecting substances into wood comprising a needle-holder having a bore, a needle at one end of the head connected to said bore, a hollow piston cylinder adjacent said bore and extending the length of the head from the needle end of the head to and opening at the end of the head remote from the needle end, said piston cylinder having an inlet opening for connection to a reservoir for substance to be injected and an outlet port communicating with said bore, the outlet port being located nearer the needle end of the head than is the inlet port, a piston in said cylinder for closing and opening said inlet port and movable toward the needle end of the head to close said inlet port and eject substance from the piston cylinder through said outlet port to said bore and needle, said piston projecting at one end from within said piston cylinder through said cylinder opening at the end of the head remote from the needle end, a presser member at the needle end of the head for engaging the wood when the tool is in use, two posts at opposite exterior sides of the head and slidably mounted thereon to move in the direction of the piston, said posts being secured at one end to the presser member, a cross bar removably secured to the projecting end of the piston and to the opposite end of each post remote from the presser member, the means for slidably mounting the two posts at opposite exterior sides of the head comprising two fixed cross members at opposite ends of the head, a collar slidably adjustable on each of said posts intermediate said cross members, a compression spring on each of said posts and abutting, at their opposite ends, said collars and said cross member at the end of the head remote from the needle end, said compression springs urging said posts and connected presser member,

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cross bar and piston in the direction of said needle end of the head, means for securing each collar to its post in the position to which it is adjusted to vary the tension of the spring, and means on said posts for limiting the stroke of the piston; the presser member, upon the insertion of the needle into the wood, engaging the wood and effecting movement of the piston to open the inlet port for charging the piston cylinder with substance, and the compression spring, upon the withdrawal of the needle from the wood, effecting movement of the piston toward the needle end of the head to close said inlet port and eject substance from the piston cylinder through said outlet port to said bore and out through said needle as the needle is being withdrawn from the wood.

2. An injection head as claimed in claim 1, the further improvement consisting in that said means for limiting the stroke of the piston comprises on each of said posts a removable sleeve which may be replaced by a sleeve of different length, each sleeve being located between said cross bar and the cross member at the end of the head remote from the needle end, and screw-threaded ends on the posts passing through said cross bar and carrying nuts.

3. An injection head as claimed in claim 1, the further improvement consisting in that screws removably attach to the head the cross member at the needle end of the head, and the last-mentioned cross member closes that end of the cylinder.

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