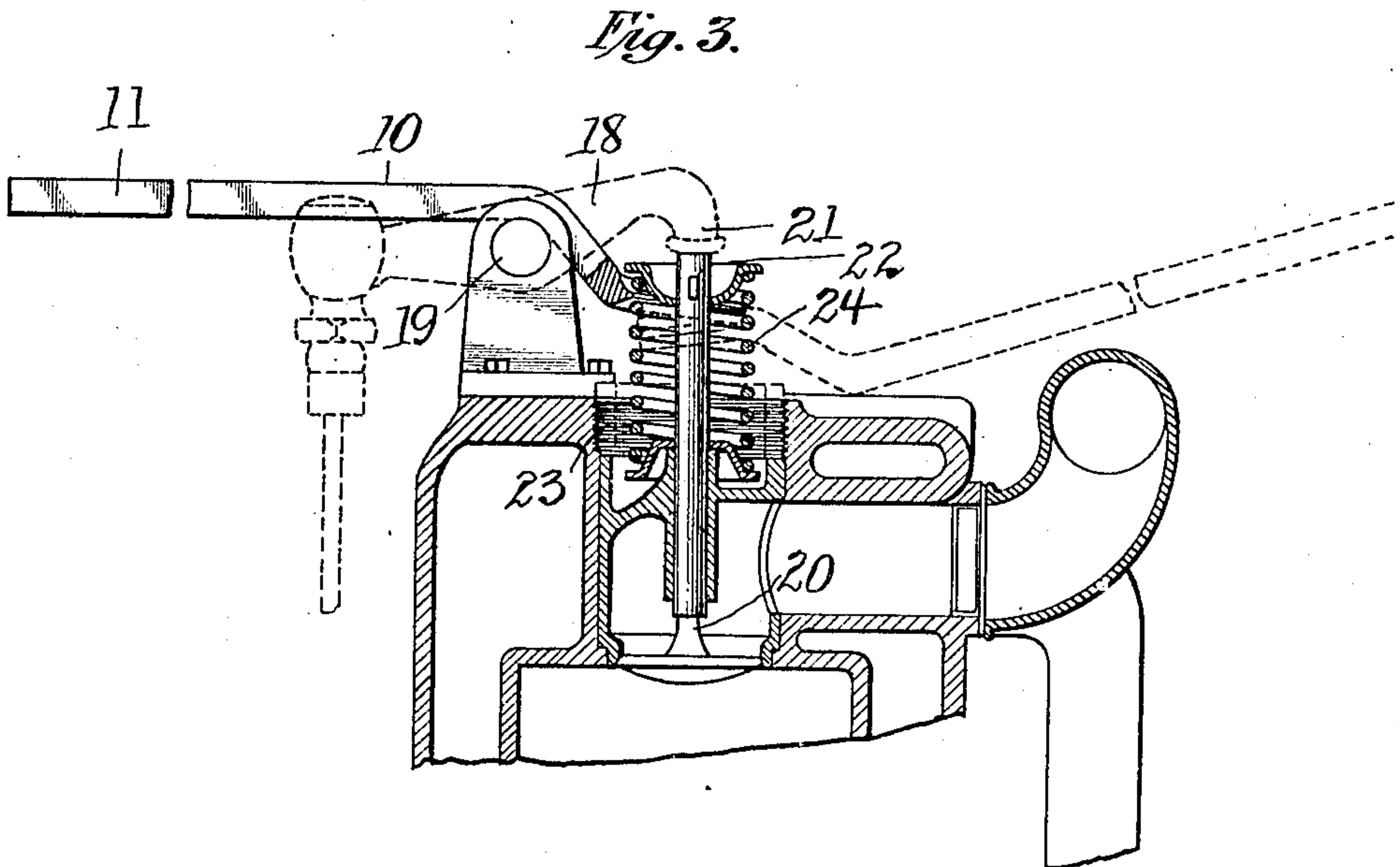
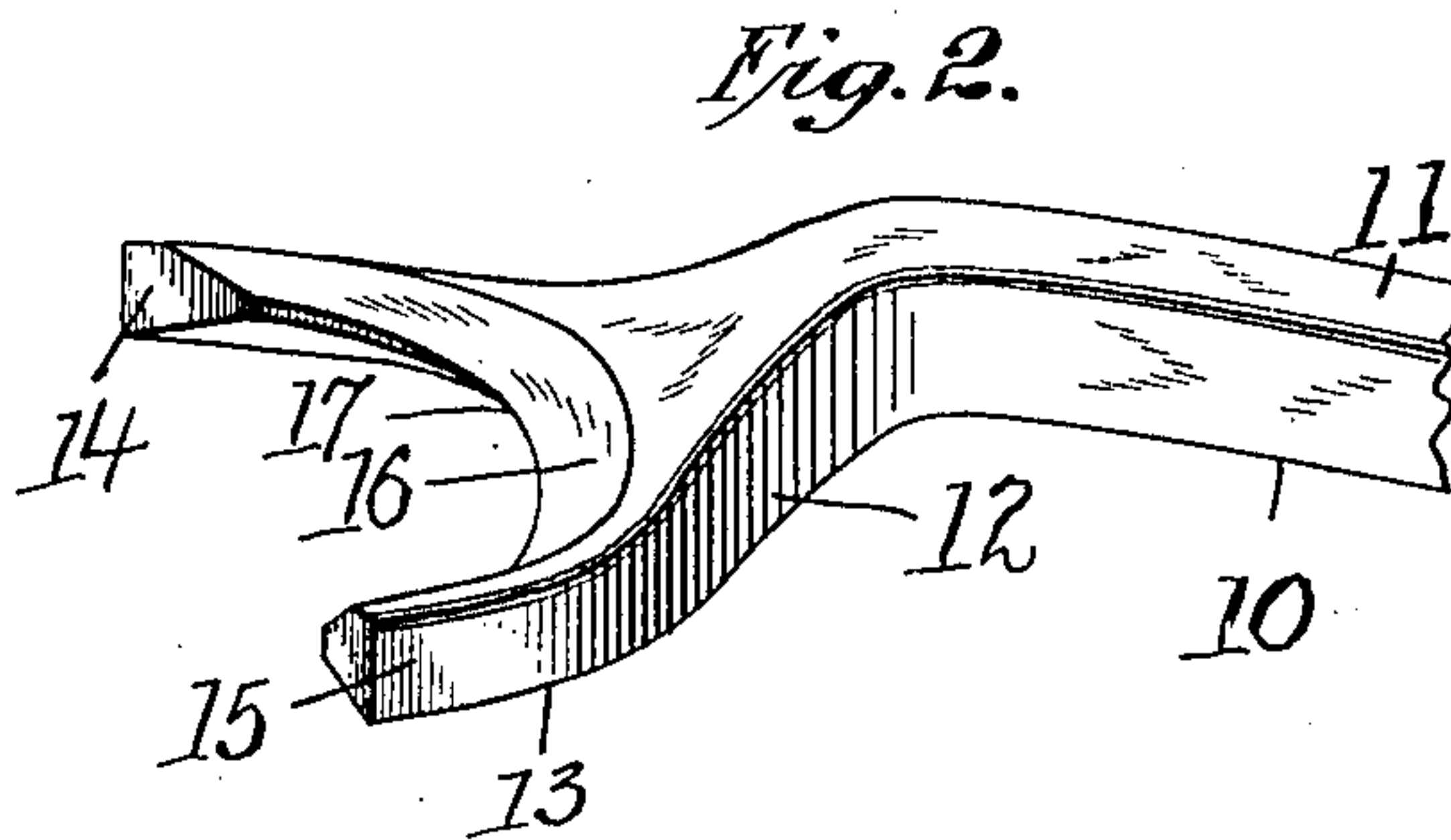
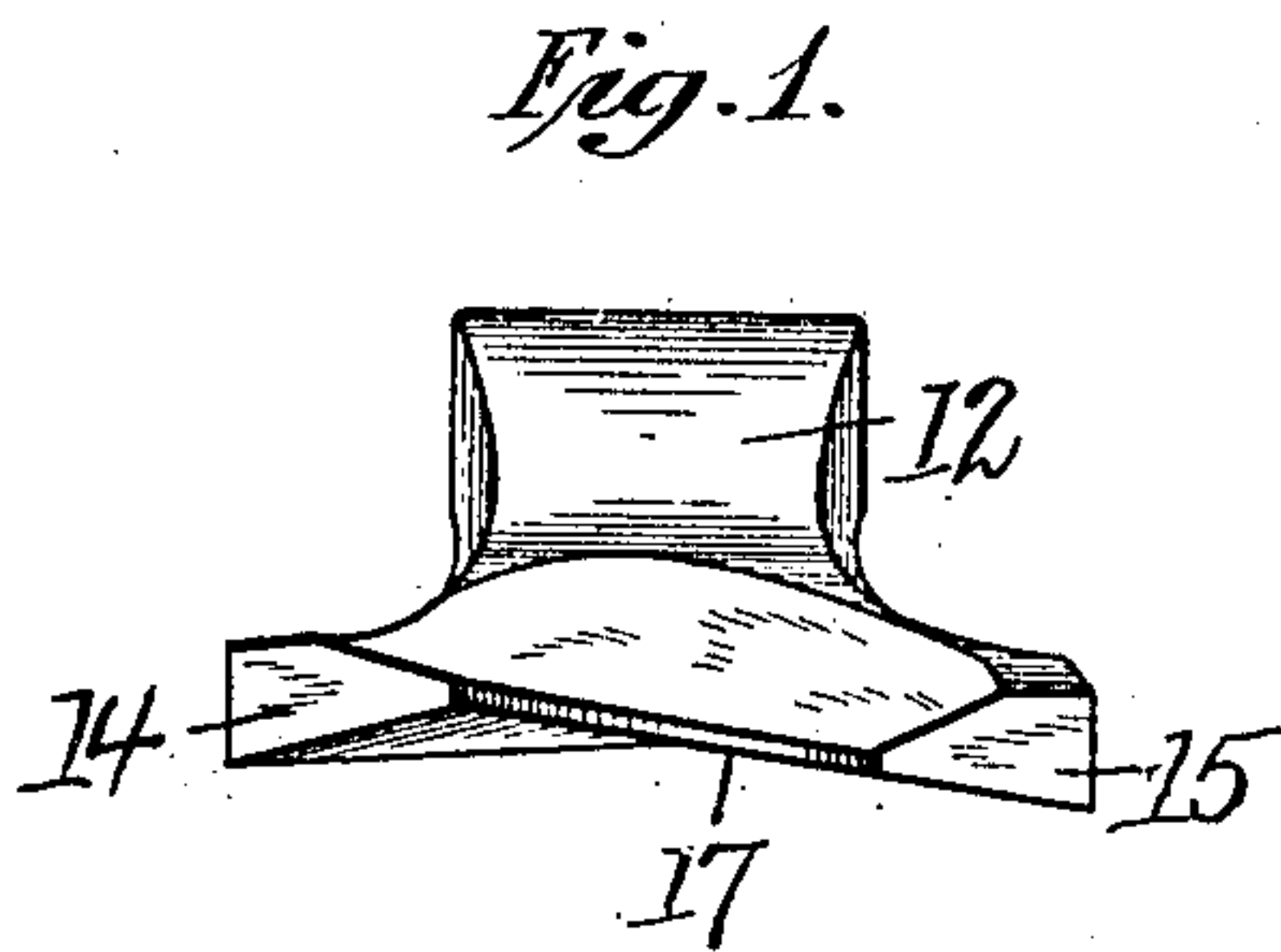


C. E. PETERSON.
TOOL FOR REMOVING OVERHEAD VALVE CAGES OF INTERNAL COMBUSTION MOTORS.
APPLICATION FILED AUG. 17, 1918.

1,298,253.

Patented Mar. 25, 1919.



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TOOL FOR REMOVING OVERHEAD-VALVE CAGES OF INTERNAL-COMBUSTION MOTORS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL E. PETERSON, a citizen of the United States, and a resident of Irvington, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Tools for Removing Overhead-Valve Cages of Internal-Combustion Motors, of which the following is a specification.

My invention relates to tools for removing overhead valve cages of internal combustion motors. Internal combustion motors constructed with overhead valves, as, for example, the Buick automobile engine, have the entire valve assembly, including valve, valve seat member, spring, and so forth, assembled together in a cage which is designed to be removed when any work is to be done on the valves, as, for example, regrinding of the valves, and when the parts have been repaired, reground or the like, the valve mechanism is restored to its place in the engine and secured in place therein. Such valve cages have to fit tightly and closely in place in order to prevent compression leaks, and when it becomes desirable to remove same, as for regrinding a valve, it is frequently found that these cages are stuck tight as by being clogged with carbon, charred oil and so forth, and considerable difficulty is encountered in their removal. Attempts to loosen valve cages, often result in injury to the parts and breakage of the cages which are usually constructed of cast iron.

The object of the present invention is the provision of a tool for applying sufficient force to remove such valve cages without injury thereto and in a simple and effective manner.

In the accompanying drawing I have illustrated a tool embodying my invention and its application to an overhead valve type of motor, as the Buick automobile engine, and in said drawing, forming part of this specification, Figure 1 is an end view of the preferred form of valve tool. Fig. 2 is a fragmentary perspective view of the tool head and shank, and Fig. 3 is a cross-sectional view of a part of a Buick engine and showing modes of use of my improved tool.

The tool illustrated to show an embodiment of my invention is adapted for use with the engine shown, and the tool is designated generally by the reference numeral 10. Such tool is constructed as a lever and embodies a handle 11 of sufficient length to enable the

user to obtain a proper purchase for applying necessary power, an offset shank portion 12 and a yoke-shaped head 13, said yoke-shaped head member preferably comprising a pair of substantially parallel prongs 14, 15 with an intermediate preferably part circular recess 16. A substantially sharp or knife-like edge 17 is provided about the recess 16, extending along the inner sides of the prongs 14, 15 and along the base of the recess between the prongs. The knife edge 17 is preferably made somewhat higher on one side than on the other so as to form substantially a portion of a helical curve similar to the curve of a portion of a valve spring, in order that the prongs 14, 15 may be adapted to have the knife edge portions thereof enter between alternate coils of the helical valve spring, whereby the tool may be effectively engaged therewith.

With the Buick type of engine such tool may be made use of in two ways, one mode of use being illustrated in full lines in Fig. 3, and another mode of use in dotted lines in the same figure. In the Buick engine the valve tappet rocker arms 18 are journaled on a round bar 19 running the length of the engine cylinders. These rocker arms 18 are adapted to operate the valves 20 by having their tappet ends 21 come into contact with the upwardly projecting ends 22 of the valves. Such rocker arms or levers must be removed before the valve and cage can be taken out of the engine. After the rocker arms have been removed the ring nuts (not shown, but which are adapted to be screwed into the threaded portion 23,) are unscrewed and taken out, leaving the cages as shown ready to be drawn out of the cylinder heads by force properly applied. In order to remove same with the tool of the present invention the head 13 thereof is engaged with the valve spring 24 which projects above the cylinder head, one of the prongs 14 being inserted within the spring on one side and the other prong 15 within the opposite side of the spring and between the coils thereof, the offset or difference in height between the knife edges 17 making it possible to engage the spring in this manner without difficulty and without danger of breaking the cage or bending the valve stem. One of the knife edges 17 is made higher than the other in order to engage the coils of the spring, one of which coils is higher than another, and to permit a per-

pendicular pull on the cage. The offset portion 12 passing over the rod 19 affords a convenient fulcrum or rest for the tool, and by pushing down on the handle 11, upward pressure is applied to the valve cage, and inasmuch as the cage is engaged by the valve spring, such pressure is applied with substantially a cushioning effect, whereby danger of breakage is reduced. Upon sufficient downward pressure being applied to the handle 11, with possibly a slight amount of working of the cage back and forth and from side to side by the tool to free it from its seat, it becomes possible to loosen and draw out the cage, even if it should have become carbonized and badly stuck. If desired, a pad of material such as felt or the like may be put over the rod 19 and under the tool 10 so as to prevent the rod from being marred by the tool, though ordinarily this is not necessary.

Another mode of utilizing the tool of the present invention is shown in dotted lines in Fig. 3. In this case the tool is turned over, the head engaged with the valve spring as before, and a rest secured for the tool on the cylinder head, the offset portion 12 being of convenient height to make this possible and downward pressure applied, using a portion of the cylinder head for the fulcrum, and the valve being loosened and drawn out substantially as already described.

While the tool as illustrated is the pre-

ferred form for use with the type of engine shown, it will be understood that tools embodying the invention may be used with overhead valve cages of other types, and that changes and modifications may be made within the scope of my claims for adapting the tool for use with the particular construction of engine and valve cage with which it is to be used.

I claim:

1. A lever tool for removing valve cages of overhead valves of internal combustion motors, said tool comprising a handle, a yoke-shaped head comprising a pair of prongs sharpened substantially to knife edges on their inner faces, one of said knife edges being vertically offset in height with respect to the other.

2. A lever tool for removing valve cages of overhead valves of internal combustion motors, said tool comprising a handle and a head having a substantially part circular recess formed therein and provided with an inner substantially sharp knife edge about said recess, said knife edge having substantially the form of a portion of a helix, and an offset shank between said head and handle.

In testimony that I claim the foregoing, I hereto set my hand, this 13th day of August, 1918.

CARL E. PETERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."