

Oct. 25, 1949.

T. E. CROCKETT

2,486,124

AIR COMPRESSOR VALVE DEVICE

Filed Feb. 2, 1946

Fig. 3.

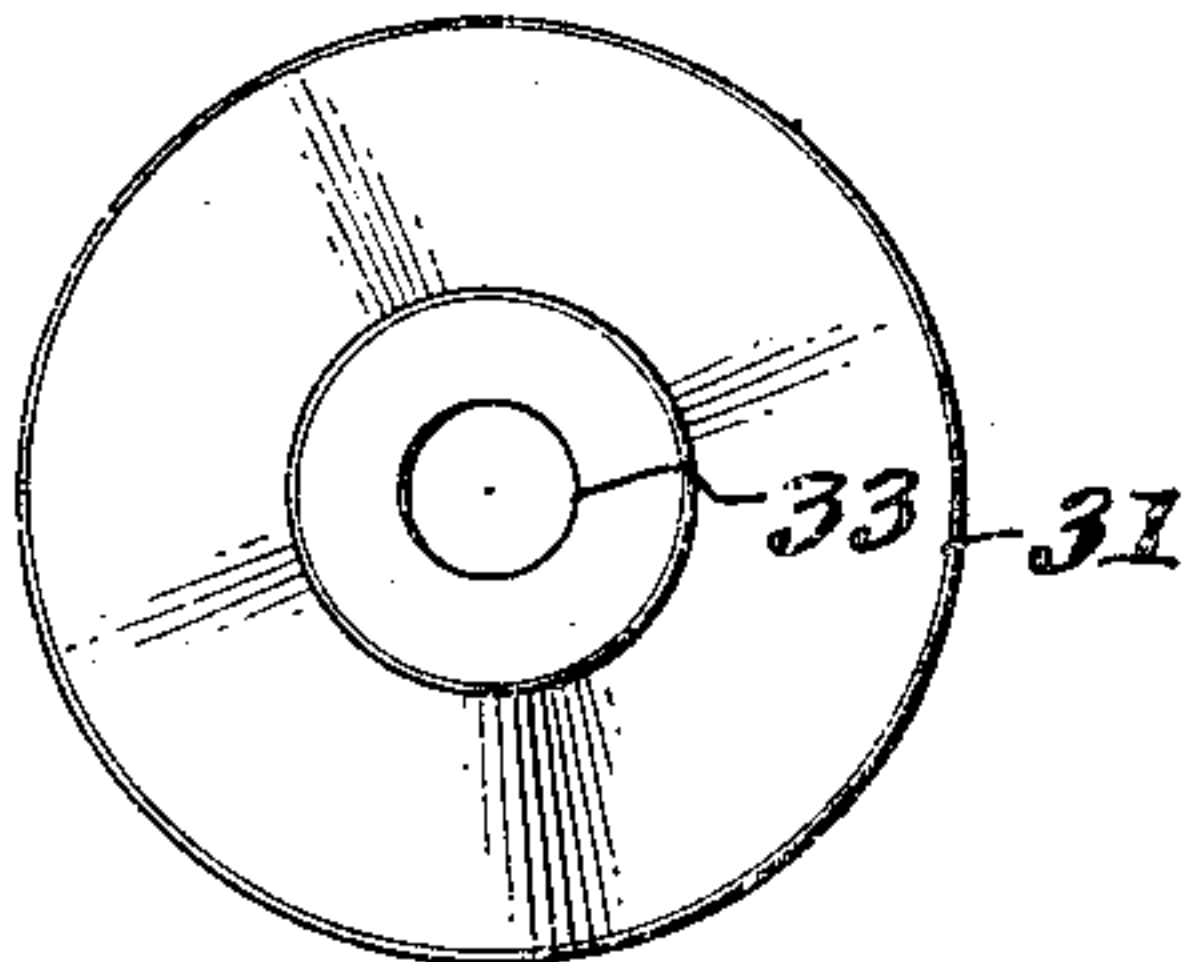


Fig. 5.

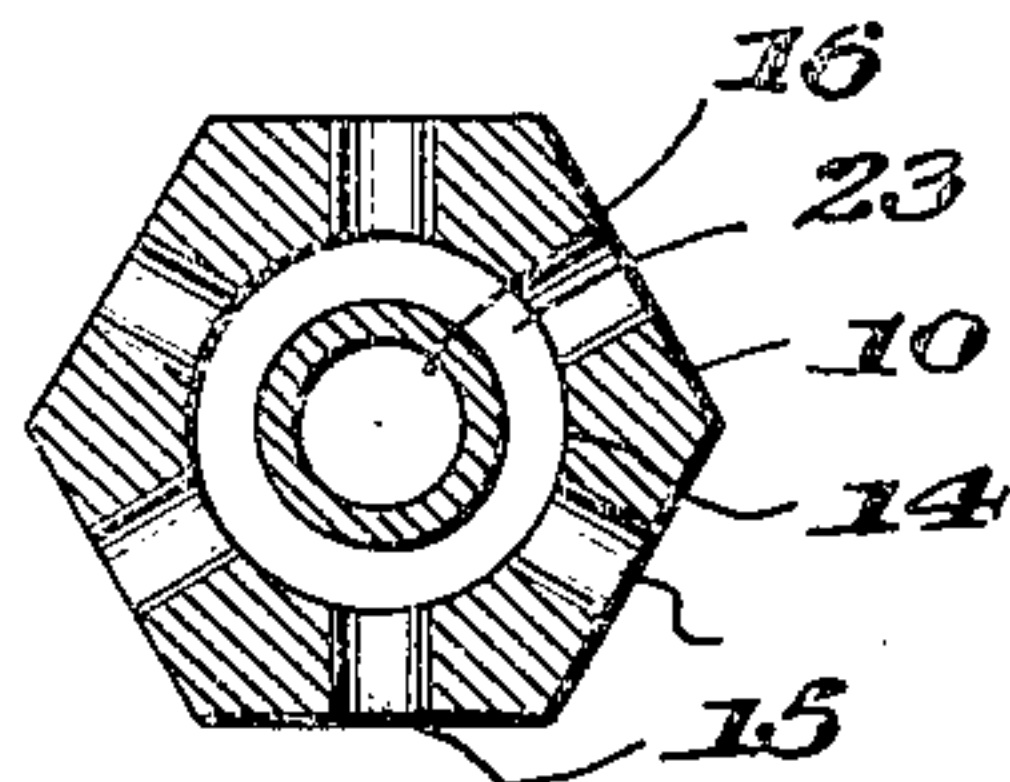


Fig. 1.

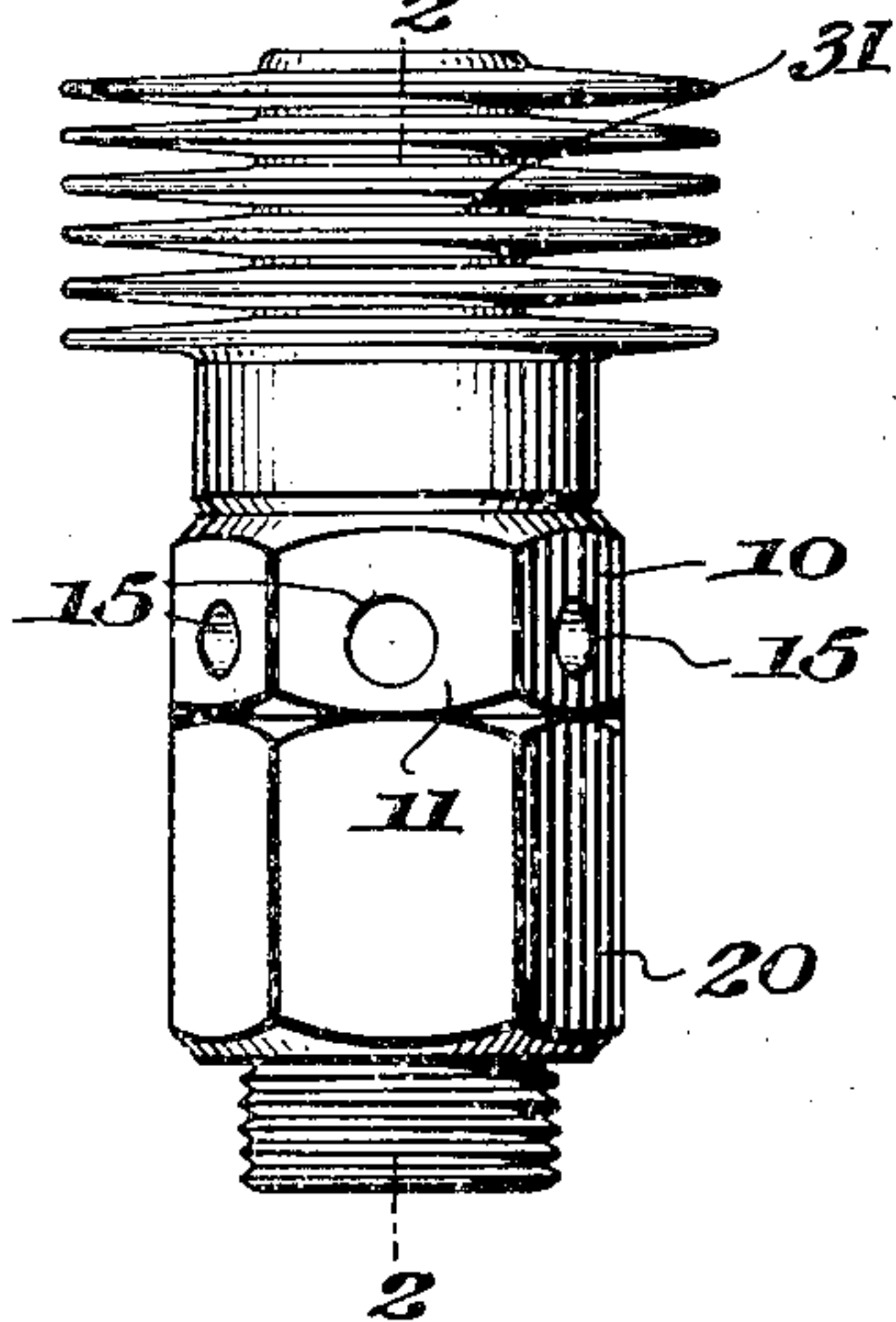


Fig. 2.

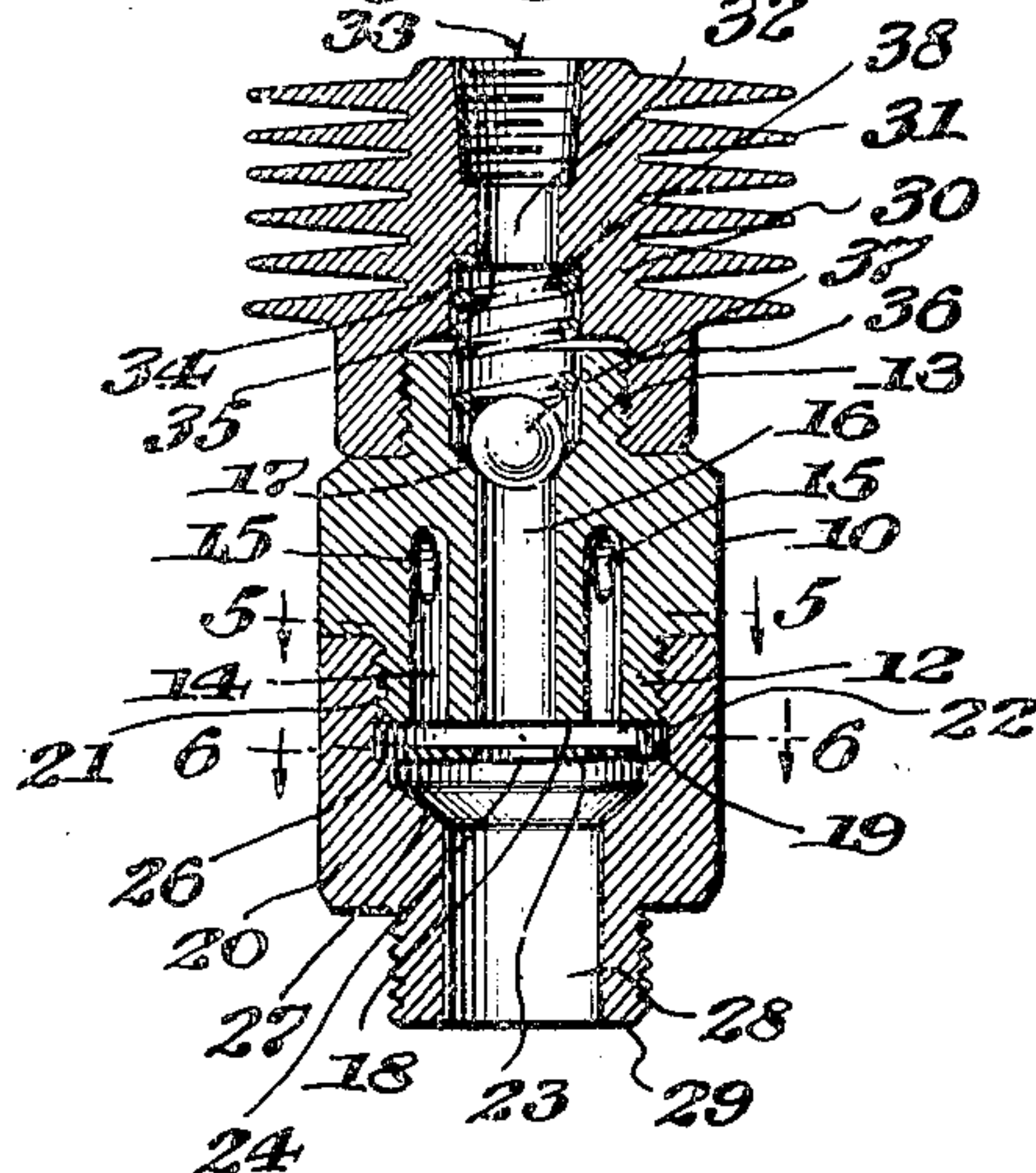


Fig. 4.

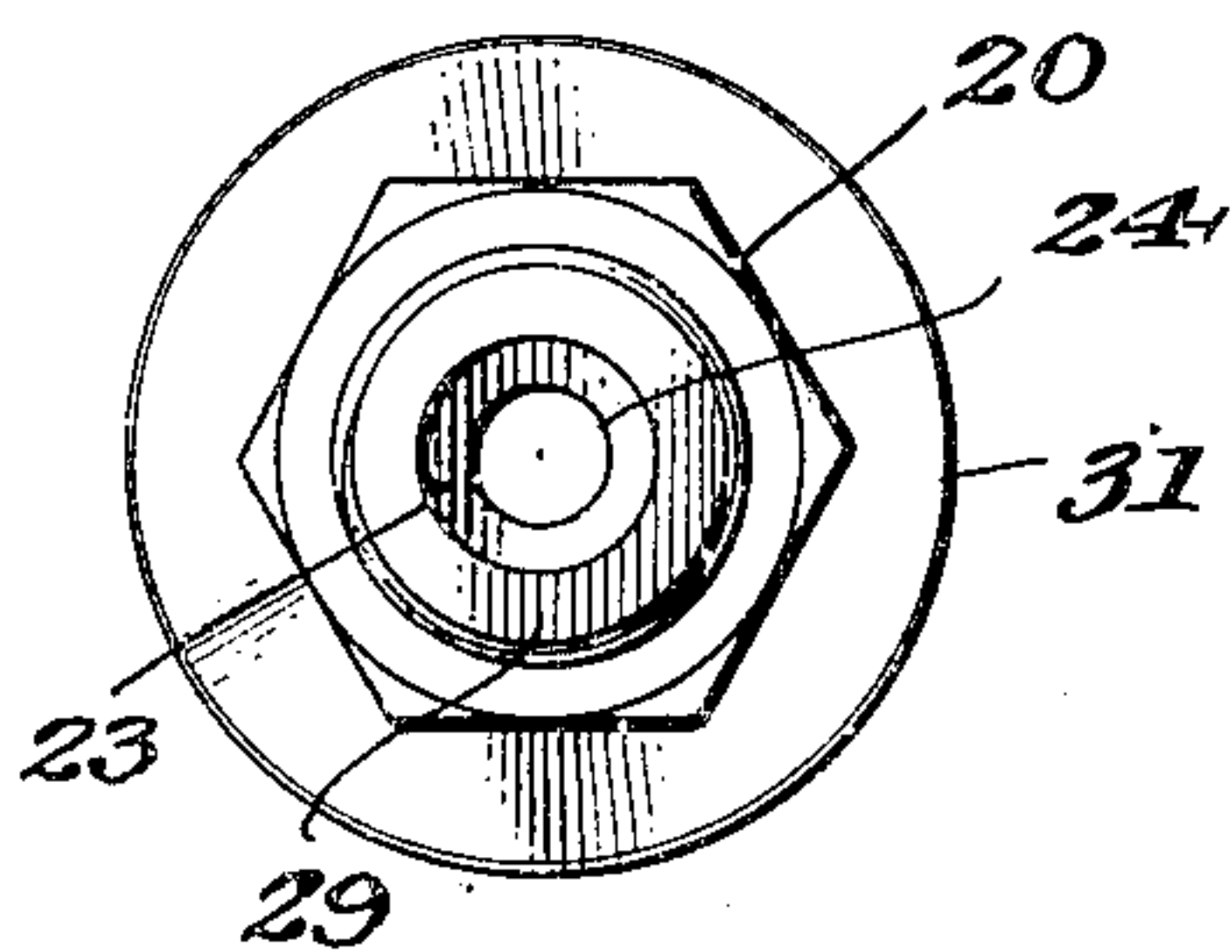
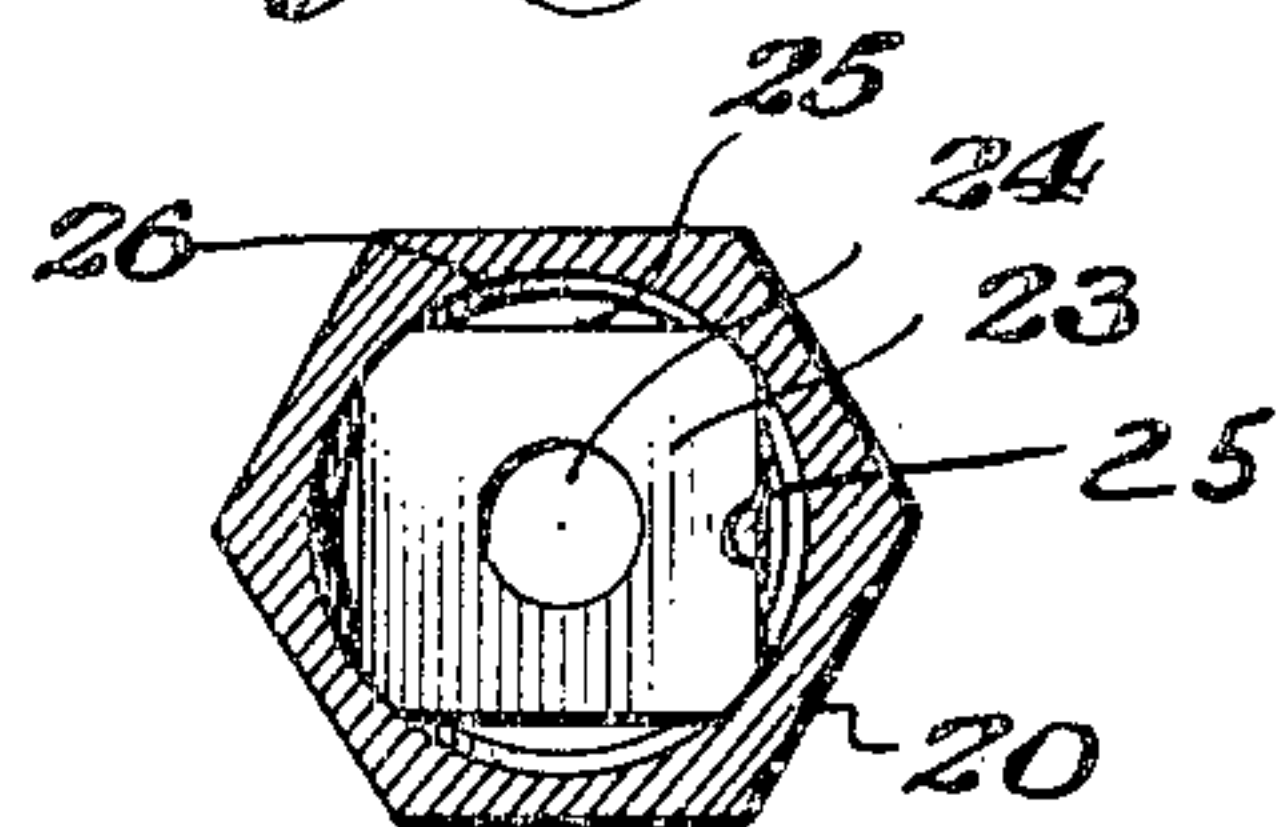


Fig. 6.



Inventor,
Thomas E. Crockett,

Boys

B. P. Kulevsk
attys

UNITED STATES PATENT OFFICE

2,486,124

AIR COMPRESSOR VALVE DEVICE

Thomas E. Crockett, Tulsa, Okla.

Application February 2, 1946, Serial No. 645,037

2 Claims. (Cl. 277—61)

1

My invention relates to a valve device and has particular reference to such a device for use in connection with one cylinder of a multi-cylinder internal combustion engine, to convert the same into an air compressor.

Important objects of the invention are to provide a device of the above mentioned character which may be readily produced upon a screw machine at a low cost; to provide a device embodying a few principle units which may be readily assembled; to provide an air inlet valve which is light and affords a large air intake, thereby increasing the efficiency of the device; to provide a fin unit for cooling the compressed air; to provide an adapter whereby the device may be connected with cylinders having spark plug openings of different diameters; and to provide a device of the above mentioned character which is simple and inexpensive to manufacture and reliable in operation.

In the accompanying drawings forming a part of this application, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a valve device embodying my invention,

Figure 2 is a longitudinal vertical section taken on line 2—2 of Figure 1,

Figure 3 is a plan view of the device,

Figure 4 is a bottom plan view of the same,

Figure 5 is a transverse section taken on line 5—5 of Figure 2, and

Figure 6 is a similar view taken on line 6—6 of Figure 2.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a main casing or body portion of the valve device. This main casing has flats 11 so that it may be conveniently turned by a wrench or the like. The body portion 10 is provided at its bottom with a reduced screw threaded extension 12 and at its top with a reduced screw threaded extension 13. The screw threaded extension 12 has an annular passage or recess 14 passing through its free end and at its top, the passage 14 leads into radial ports 15. The body portion 10 is provided with a central port 16, disposed within the annular passage 14 and concentric with relation thereto. The lower end of the port 16 passes through the free end of the reduced extension 12 while the top of the port 16 leads to a valve seat 17, disposed at the bottom of the bore of the upper tubular extension 13. The port 16 and passage 14 form inner and outer annular seats 18 and 19 of a double valve seat.

The numeral 20 designates a tubular adapter having a screw threaded recess 21 for receiving the screw threaded extension 12. This tubular adapter has a recess 22 for receiving a disc valve

2

23, which is relatively large and light. This disc valve has a central opening 24 to register with the port 16, while outwardly of the opening 24, the disc valve is adapted to engage the two seats 18 and 19, when moving upwardly, to cover the annular passage 14. The edge of the disc valve is cut away at 25, to provide marginal passages for the entrance of air. The downward movement of the disc valve is limited by a shoulder 26 formed within the tubular adapter. Beneath the shoulder 26, the tubular adapter has a tapered bore 27 leading into a main bore 28, passing through a reduced extension 29, which is to engage within the screw threaded spark plug receiving opening of the cylinder of the internal combustion engine.

The numeral 30 designates a tubular cooling unit, having annular radial cooling fins 31. This tubular cooling unit has a bore 32 leading into an enlarged screw-threaded bore 33, adapted for receiving a screw-threaded coupling attached to a hose or the like, which leads to a source of use. Beneath the bore 33, the tubular cooling unit 30 has an enlarged bore 34, forming a shoulder 35. The cooling unit has an internally threaded coupling sleeve 36, to receive the screw threaded tubular extension 13. An outlet check ball valve 37 is mounted within the tubular extension 13 and engages the seat 17 and is engaged by a compressible coil spring 38, engaging the shoulder 35.

The operation of the valve device is as follows:

The spark plug is removed from the screw threaded opening in one of the cylinders of a multiple cylinder internal combustion engine and the screw threaded extension 29 is screwed into this spark plug opening. Upon the down stroke of the piston within the cylinder, the suction will move the disc valve 23 downwardly to unseat the same, while check ball valve 37 is seated. Air will enter through radial ports 15 and through the annular passage 14 and will pass through the central opening 24, and the marginal passages at 25 and through the reduced tubular extension 29 into the cylinder of the engine. The disc valve 27 is light and works freely and the air inlet openings are of large combined cross sectional area and permit of the free entrance of the air into the cylinder of the engine, at a low suction, and hence this air will enter the cylinder of the engine with the exclusion of the gas charge which is ordinarily drawn from the carburetor. Upon the upstroke of the piston within the cylinder, valve 37 being at first held seated by the spring 18, disc valve 23 moves up and engages the two valve seats 18 and 19, covering and closing the annular passage 14. The air is compressed and passes through the opening 24 into port 16 and unseats check ball valve 37 and then passes through the tubular cooling unit 30. When passing through the tubular cooling unit, the com-

3

pressed air is suitably cooled so that it will not burn the rubber hose or the like, if the same is used. When the piston moves down the check ball valve 37 closes and the disc valve 23 again opens.

The valve device may be used in connection with the cylinder of an engine for supplying compressed air for various purposes, such as spray painting, insecticide spraying, inflating of tires or for various other uses.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:

1. A valve device, comprising a relatively short tubular adapter having its side imperforate and provided with a main cylindrical axial passage extending through one end thereof, said passage having its outer portion internally threaded and its inner portion in the form of a chamber having a shoulder, said adapter being provided at its opposite end with a reduced extension for insertion within a spark plug opening, the reduced inner extension having an axial bore leading to the chamber, a relatively short body portion having generally the same length as the adapter, said body portion having a reduced externally threaded extension to engage within the screw threaded portion of the passage, said body portion having a central axial port passing through the inner end of the reduced extension and an annular passage surrounding the outlet port and passing through such inner end, said body portion having radial ports arranged outwardly of the adapter and leading into the annular passage, a disc valve arranged within the chamber and guided by the same and having cut out portions at its edge and a central opening, the disc valve covering the annular passage when seated, a reduced externally screw threaded tubular extension carried by the end of the body portion remote from the adapter, a tubular coupling provided with an axial screw threaded recess for receiving the last named reduced tubular extension and having a bore and a shoulder, a check ball valve within the last named tubular extension to cover the central axial port, and a spring arranged within the bore of the tubular coupling and engaging the check valve and the shoulder of the tubular coupling, the arrangement being such that the adapter, body portion and tubular coupling are disposed in end to end relation and are readily separable.

4

2. A valve device, comprising a relatively short tubular adapter having its side imperforate and provided with a main cylindrical axial passage extending through one end thereof, said passage having its outer portion internally threaded and its inner portion formed into a chamber having a shoulder, said adapter being provided at its opposite end with an axial reduced extension which is externally screw threaded for engagement within a spark plug opening, the reduced inner extension having an axial bore leading to the chamber, a relatively short body portion having generally the same length as the adapter, said body portion having a reduced externally threaded axial extension at one end to engage within the screw threaded portion of the passage, said body portion having a central axial port passing through the inner end of the reduced extension and an annular passage surrounding the outlet port and passing through such inner end, said body portion having radial ports arranged outwardly of the adapter and leading into the annular passage, a disc valve arranged within the chamber and having a central opening, the disc valve covering the annular passage when seated, a reduced externally threaded axial tubular extension carried by the end of the body portion remote from the adapter, a tubular coupling provided at one end with an axial screw threaded recess for receiving the last named reduced tubular extension and having an axial bore, a check ball valve within the last named tubular extension to cover the central axial port, a spring arranged within the axial bore of the tubular coupling and engaging the check valve, the axial bore of the tubular coupling having an outer screw threaded portion, and heat radiating fins carried by the tubular coupling, the arrangement being such that the adapter, body portion and tubular coupling are disposed in end-to-end relation and are readily separable.

THOMAS E. CROCKETT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,179,022	Melmore	Apr. 11, 1916
1,287,174	Anthony	Dec. 10, 1918
1,911,097	Spicer	May 23, 1933

FOREIGN PATENTS

Number	Country	Date
265,982	Italy	1929