

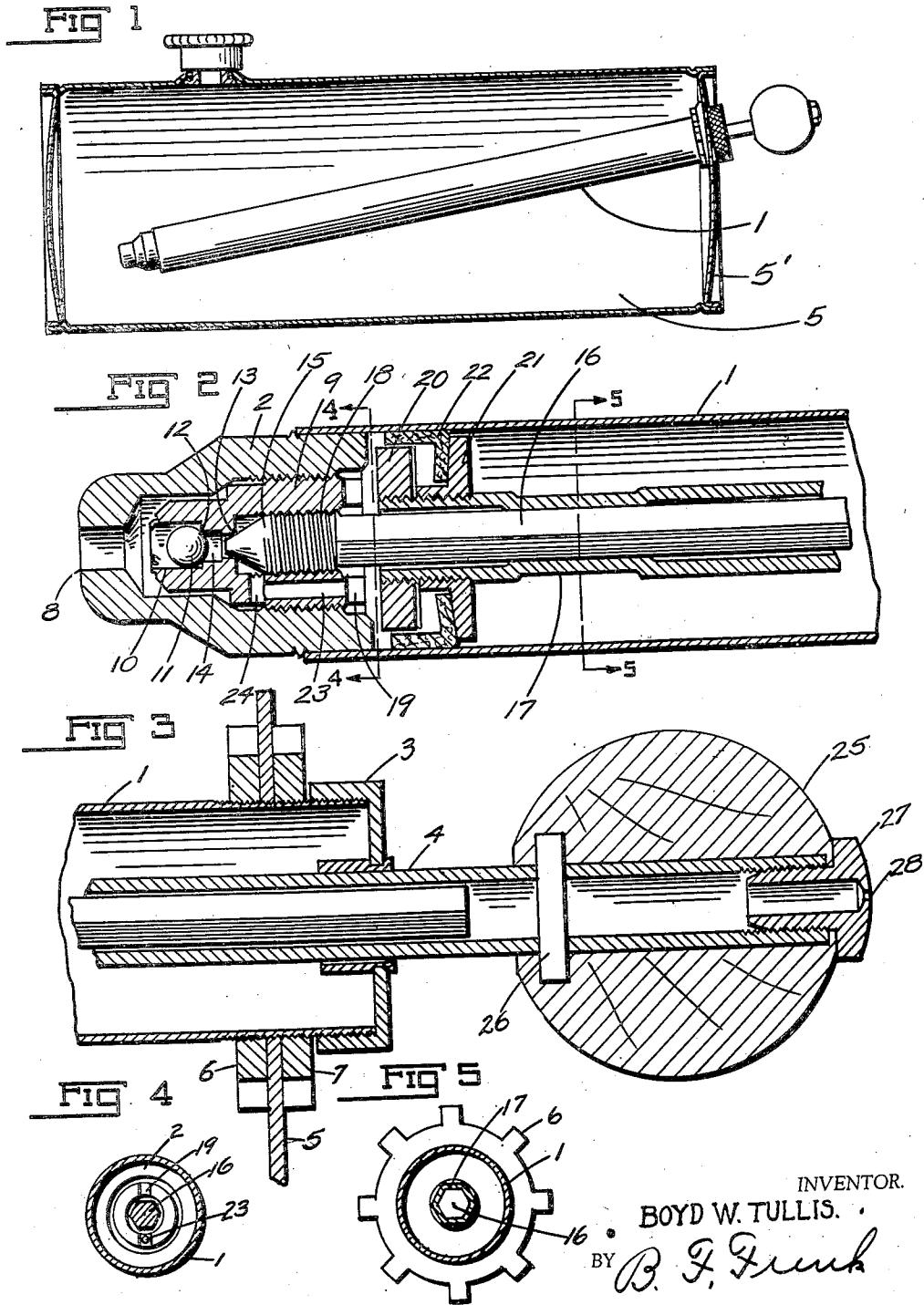
July 10, 1934.

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1,966,321

AIR PUMP FOR PRESSURE TANKS

Filed Dec. 1, 1933



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1,966,321

AIR PUMP FOR PRESSURE TANKS

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Application December 1, 1933, Serial No. 700,401

1 Claim. (Cl. 230—190)

This invention relates to air pumps and particularly to air pumps used in connection with liquid hydrocarbon fuel burning devices. For example, stoves, lamps, lanterns, and the like, which use liquid hydrocarbon fuel under air pressure, usually employ a tank to contain the liquid, the air being supplied through a built-in pump. My invention is particularly designed for use in connection with tanks but it is just as efficient either built-in with the tank or used separately. One of the difficulties encountered with pumps, particularly of the built-in type, is that a ball check is made removable from the nozzle or so-called base because that is the wearing part of the pump.

Prior to my invention, the check body had a projecting end which extended beyond the inner end of the base or nozzle body. This was for the purpose of permitting a tool to engage the check body to remove it for inspection and repairs. The projecting end of the check body acted as a stop for the pump plunger, the result being that there was an appreciable space between the plunger and the end of the base when the plunger was at the limit of its compression stroke. The air confined in the space, being compressed, had a tendency to expand just as soon as pressure was relieved on the pump plunger so the plunger rod would spring back through the cylinder opening. I have rearranged the parts so that practically all of the compressed air will be forced out of the pump cylinder, so that the rebound cushion will be reduced to a minimum if not wholly eliminated.

Another important feature of the invention is that instead of forcing the air through grooves or between the threads of the shut off valve stem and the check body, an unobstructed passageway is provided which permits the compressed air to more easily flow from the pump cylinder out through the check thereby increasing the efficiency of the pump.

The novelty of the invention will be clearly understood by reference to the following description in connection with the accompanying drawing in which:

Figure 1 is a sectional view through a tank showing the pump in elevation.

Figure 2 is an enlarged longitudinal sectional view through the delivery end of the pump.

Figure 3 is an enlarged cross-sectional view through the barrel of the pump showing the manner of fastening it to the tank.

Figure 4 is a sectional view on the line 4—4 of Figure 2, and

Figure 5 is a sectional view on the line 5—5 of Figure 3.

Referring now to the drawing by numerals of reference, 1 designates the barrel which of course may be tubular in form, having one end fastened to the nozzle or base 2 and the other end provided with a cap 3 through which the hollow plunger rod 4 projects, the barrel being fastened to the end 5' by the nuts 6 and 7 on opposite sides of end 5', of the tank 5 said nuts being threaded on the barrel 1 as seen in Fig. 3.

The pump nozzle or base is provided with a discharge opening 8. Threaded within the base is a check body 9 having a shouldered portion 10 to receive a ball check 11, the ball check being an outwardly opening valve adapted to seat upon the seat 12. There is a valve seat 13 surrounding the central opening 14 in the ball check, the valve seat 13 being adapted to receive a cone-shaped valve 15 on the angular valve stem 16 within the tubular plunger rod 4. The plunger rod is pinched or constricted at 17 so that the rod will be loosely received within the tube 4 to permit longitudinal movement of the tube or plunger rod 4 but prevent independent rotative movement of the rod 4 with respect to the valve stem 16. Therefore, the plunger rod can be reciprocated independently of the valve stem 16 but a rotation of the plunger rod will cause a turning movement of the stem, consequently the thread connection 18 between the ball check and the valve stem will cause the valve to seat and unseat as will clearly be seen by reference to Figure 2.

The ball check is provided with a slotted portion 19 which is slightly within the nozzle or base 2, indeed, the ball check is entirely within the nozzle so that the pump plunger consisting of the head 20 and the spaced keeper 21 with the cup leather 22 between them, can move down close to the end of the nozzle 2 so as to expel all of the air from the barrel through the elongated channel opening 23, having an angular outlet 24 into the center space of the ball check, thus liability of the confined air expanding and causing rebound of the pump plunger will be reduced to a minimum if not wholly eliminated.

There is a material advantage in constructing the ball check in the manner above described because an independent positive passageway is provided for the discharge of the air from the cylinder into the nozzle whereas heretofore, dependence was had upon either grooves in the threaded part of the check or in the spaces made by loosely threaded connections between the ball check and

the valve stem. The pump plunger can be operated in any appropriate manner, but for convenience, I have shown a ball 25 on the end of the plunger rod 4. The ball is held thereto by a pin 5 26 and the nipple nut 27 which screws into the end of the plunger rod 4 and provided with an opening 28 so that any confined air in the space between the plunger and the base, can escape when the thumb is removed from the opening, 10 it being understood of course at the time of pumping that the thumb covers the opening 28.

From the foregoing it will be seen that I have provided a simple, easily operated pump having advantages over existing types of pumps.

15 The valve seats in the check body sometimes become clogged or worn so it is necessary to replace them. Since the pump is fastened to the tank, it would be a difficult operation to remove the entire pump. Therefore, the valve stem is 20 unscrewed out of the check body, the cap 3 is removed so that the plunger, its rod and the valve

and stem can all be removed. Then, a long screwdriver or similar tool is inserted in the barrel to engage the slotted portion 19 so that the check body can be taken out for inspection, repair or replacement. The replaced check body or a new one can be introduced into the base or nozzle and the plunger, valve, etc., reassembled with respect to the barrel in an obvious manner.

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What I claim is:

An air pump comprising a barrel, a discharge nozzle at one end of the barrel, a removable check body in the nozzle having means to be engaged by a tool so that it can be removed and replaced in the nozzle, a pump plunger, means for operating the pump plunger, a valve having screw threaded connection with the removable check body to engage a seat therein, the check body being supplied from the pump barrel through an orifice in the check body outside the perimeter of the valve.

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