Jan. 21, 1941. I. B. KUBILIUNAS 2,229,213

COMBINATION AIR CHUCK AND NOZZLE

Filed Feb. 7, 1938

Fig. 1.

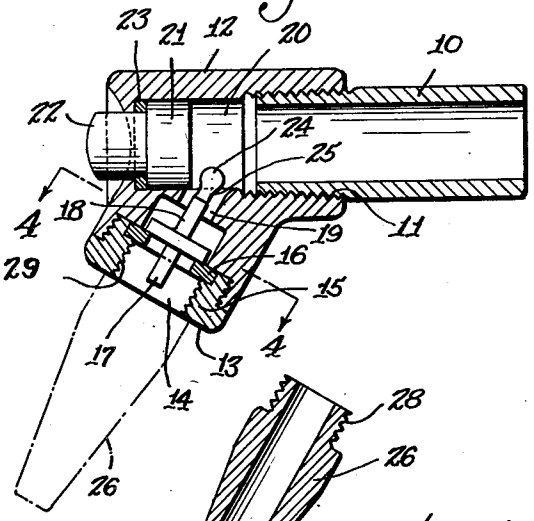


Fig. 2.

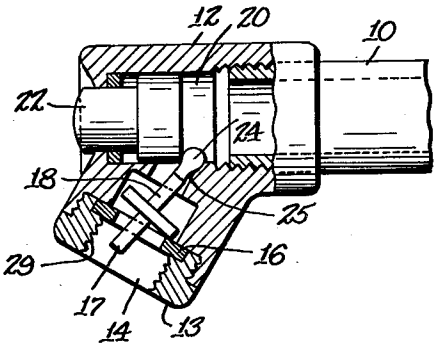


Fig. 3.

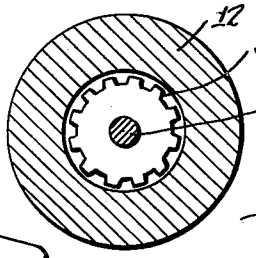


Fig. 4.

Fig. 5.

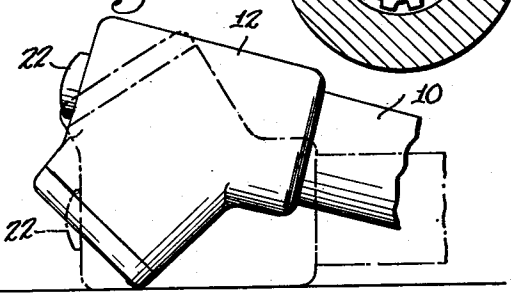
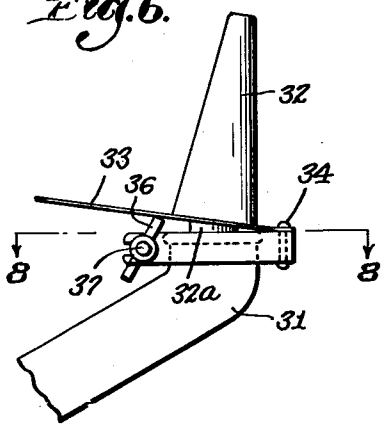


Fig. 6.



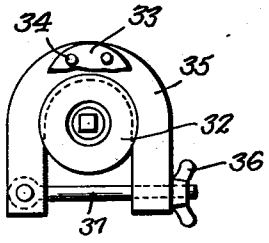
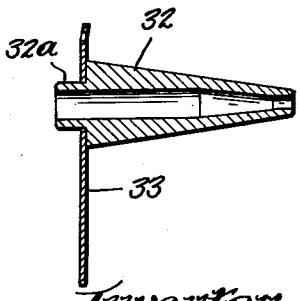


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE

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COMBINATION AIR CHUCK AND NOZZLE

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Application February 7, 1938, Serial No. 189,178

4 Claims. (Cl. 299—149)

This invention relates to improvements in air chucks of the type used in delivering compressed air or other gases from a supply source. Its objects are to provide a simple, cheap, easily operated and efficient means of delivering compressed gases; to combine with an air chuck, of the character generally employed in filling stations and the like for inflating pneumatic tires, means for releasing air from the chuck independently of the normal air chuck valve releasing means; to effect such releasing action either with or without nozzle means for constricting the path of the gas; also to provide separate nozzle improvements for an air chuck; and generally to effect a strong durable structure which is protected, in any position it may assume, from accidental operation of the valve releasing means. The invention consists in means and combinations suitable for accomplishing the foregoing objects, as explained in the following specification and includes not only the specific embodiments so described but all substantial equivalents thereof within the scope of the appended claims.

In the accompanying drawing:

Fig. 1 is a symmetrical central cross section of my improved air chuck;

Fig. 2 is a view similar to Fig. 1 and illustrates the valve means in an open position;

Fig. 3 is a detailed view of a nozzle member;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 1.

Fig. 5 is a diagrammatic view illustrating positions taken by the air chuck when not in use;

Fig. 6 is a view in side elevation showing a modification of air nozzle for a chuck;

Fig. 7 is a front elevation of the nozzle and spring assembly shown in Fig. 6 with the spring partly cut away; and

Fig. 8 is a cross section taken on the longitudinal axis of the nozzle member illustrated in Fig. 6.

Referring more in detail to the drawing, 10 indicates a pipe means for delivering a compressed gas such as air therethrough and is threaded at 11 to engage with a similarly threaded portion of a chuck member 12. The bushing 15 is recessed at its inner side to receive a valve seat 16 and secure it against the housing 12. The valve seat 16 loosely supports a valve member 17 at its under side and an opening 19 of an even further reduced diameter receives therethrough an extended valve portion 18 while the valve itself is maintained loosely adjacent the seat and is prevented from falling away beyond a definite point. The opening 19 connects with a cylindrical chamber 20 in housing 12 to comprise a passageway for release of compressed gas. When gas is delivered under pressure from the pipe 10, the valve 17 becomes engaged against the seat 16 and is maintained by the pressure. However, if no pressure is being delivered the valve may drop away from the seat to only a limited extent since by the construction of the opening 19 there results an annular shoulder portion in the housing 12 against which the valve must rest. The chuck 12 has been designed with an enlarged body portion as shown in Figs. 1 and 2 at one end of which is slidably received a plunger 21 having its path of movement intersecting the line of projection of the valve stem portion 18. A head 22 is fixed to the plunger 21 and air pressure maintains the plunger 21 firmly against the gasket 23. It will be noted that valve 17 and chuck face 13 may operate at any time in the conventional manner of being applied over the valve stem of a tire. However, by depressing the head 22, plunger 21 angularly contacts member 17, tending to tip it into a position such as that shown in Fig. 2, which breaks the seal between the plunger and the gasket 16, thereby permitting air to pass through the opening 14 in the chuck face.

It will be noted that portion 18 has been formed with a ball 24 and constricted neck 25. While not limited to such a construction, I may prefer to utilize this or some similar means for providing easier and more positive tipping action of the portion 18 by the plunger 21. When the mechanism is in the position shown in Fig. 2, air is released through the chuck independently of the conventional method of depressing the valve 17 from the outside. For some purposes, such a releasing means may be satisfactory and greatly desirable, but it may also be desired to supply the air through a nozzle such as 26 illustrated in Fig. 3 which is of conventional form and construction, having its tip comprising a straight cylindrical passageway 27.

When such a nozzle member is desired, I may associate it with the mechanism already described by effecting threads 28 on the nozzle member and by forming similarly sized threads 29 on the inside of bushing 15. Such association of the nozzle member with the face of the chuck has been indicated in broken lines in Fig. 1. I may also desire to employ, as well as a conventional valve, a valve design such as that shown in Figs. 1 and 4, in which the outer edge of the valve 17 may be scalloped as indicated at 30, or otherwise serrated, so that should only a slight tipping of the portion 18 occur, somewhat

increased passageway for air is effected. This will be done without affecting the conventional sealing action occurring between valve 17 and gasket 16 as illustrated by the proportionate size of the serrations shown in Fig. 4.

The nozzle 26 may comprise any type of means for spraying or feeding gases or liquids, or mixtures of the two. For instance, I have in mind applying nozzle means such as that used on spray guns in which liquid is introduced through the side of the nozzle in the well known manner and not considered necessary to be illustrated and described in connection with the present air chuck illustration. The operation of the valve with the head 22 has been facilitated by so arranging the head that the length of tubing and conductor such as 10 is firmly grasped in the hand and the head 22 readily falls into a position adapted to be operated by the downward pressure of the thumb, which provides a better leverage. At the same time the head is preferably constructed of a size such that it extends beyond the chuck body only a slight distance. This is desirable for the reason that in use, less likelihood of accidental release or depressing of the head and plunger will occur, and to further this effect the chuck 12 has been formed with a concaved area around that portion through which the head projects.

It is pointed out that air chucks in general, whether used in garages, filling stations, or machine shops, are usually subjected to rough usage and must be sufficiently durable to withstand pressure of heavy objects and be adapted to falling into various positions without release of the valve. In connection therewith, I have formed the chuck body in somewhat of an elbow shape and placed the plunger in such manner that no matter what position the chuck may be thrown into, it will not come to rest on the head 22 and thereby release or open the valve 17. Fig. 5 more clearly illustrates the protected arrangement of the plunger head 22 in various positions of the tool. The full line position shows the chuck face down, and the broken line position shows the chuck face up.

With this construction, a strong, durable and simply operated and adjusted air chuck is provided which may be operated in three ways: (*a*) as a normal chuck for a tire valve; (*b*) as a source of supplying air in which the valve is released from the inside without a nozzle; and (*c*) as a source of supplying air with a nozzle. Either one of the latter two operations may be useful in air blasting for various purposes as in cleaning, drying, and the like.

Figs. 6 to 8 inclusive relate to a modified form of nozzle and releasing means for an air chuck 31 of the conventional order. 32 indicates a nozzle member which may be of any desirable shape as for instance the form shown in cross section in Fig. 8. The nozzle may be received on some supporting means as for instance the flat spring 33 shown partly cut away in Fig. 7, and the opening in the nozzle 32 is continued through the flat spring 33 by means of a tubular extension 32*a*, which may either be a separate element or formed as a part of the nozzle as shown in Fig. 8. The spring member 33 may be resiliently associated with the face of the chuck 31 in some desirable manner as for instance by securing it with pins 34 to the top of a U-shaped member 35 which is adapted to be received around the outer periphery of the chuck 31 and tightened thereagainst by some suitable means as a wing nut 36 and bolt 37.

The flat spring 33 will preferably be bent in a manner such as that illustrated in Fig. 6 so that the nozzle member 32 and the tubular portion 32*a* are maintained away from the face of the chuck 31 and the tubular portion is out of contact with the chuck valve. However, when the spring 33 is pressed against the face of the chuck, the tubular member enters into the conventional opening therein, thereby opening the valve and permitting air to pass out through the nozzle 32, with the tubular member 32*a* acting as a conducting member as well as opening the valve.

A practical and efficient means for increasing the field of use of air chucks of the type used in filling stations is provided by the construction shown, and an efficient and easily mounted nozzle means is associated with such a chuck by only one adjustment. Also, the valve opening portion of the nozzle and its tubular portion 32*a* is extremely positive and may be operated by depressing the spring or by pressing the nozzle directly against the work as for instance a tube to be blown out.

Having thus described my invention, what I claim is:

1. An improved air chuck for an air hose comprising in combination a housing having a chamber, a face for contacting a tire valve and a chuck valve in said face adapted to be opened by contact with said tire valve, said chuck valve having its inner extremity extending angularly into said chamber and formed with a rounded end, said chamber housing comprising an extended portion in which is slidably received a plunger member normally engaged against the chamber by gas pressure therein and adapted to be urged against the said rounded end of the valve stem in an angular direction to gradually open the valve.

2. An improved air chuck for an air hose comprising in combination a housing having a chambered portion with an inlet thereto and an annular hollow body angularly connecting with the body to present an outlet therefrom, said annular body portion formed with a flat face in which is received a valve, said chambered body portion being extended to receive externally operated plunger means for operating the valve means, the plunger means being so located that when compressed by the thumb of the operator its direction of movement will be at right angles to the grip of the operator on the housing whereby improved leverage and control of the plunger action is attained.

3. An improved gas chuck for a tire valve comprising in combination a housing having an inlet and outlet thereto, a valve seat in said outlet, a valve located in said housing and adapted to be engaged against said seat by gas pressure, a supporting portion in the housing for maintaining the valve loosely adjacent the said valve seat in the absence of pressure, stems located at either side of said valve, one of said stems extending through the said supporting portion, and externally operated piston plunger means in the housing adapted to tilt the said extending stem and open the valve thereby.

4. An improved gas chuck for use with tire valves comprising in combination a housing having an inlet and outlet thereto, a valve seat located in said outlet, a valve received in the housing and adapted to be engaged against said valve seat from within the housing by gas pres-

sure, a supporting portion in the housing for maintaining the valve loosely adjacent the said valve seat in the absence of pressure, a stem formed on said valve extending through the said supporting portion, said housing having a cylindrical opening formed therein, a piston plunger slidably engaged in the cylindrical opening adapted to tilt the said stem and open the valve from within the housing thereby, and said plunger being arranged relative to the said stem such that upon tilting the stem the plunger is partly engaged in the cylindrical opening to substantially prevent passage of air through the opening.

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