

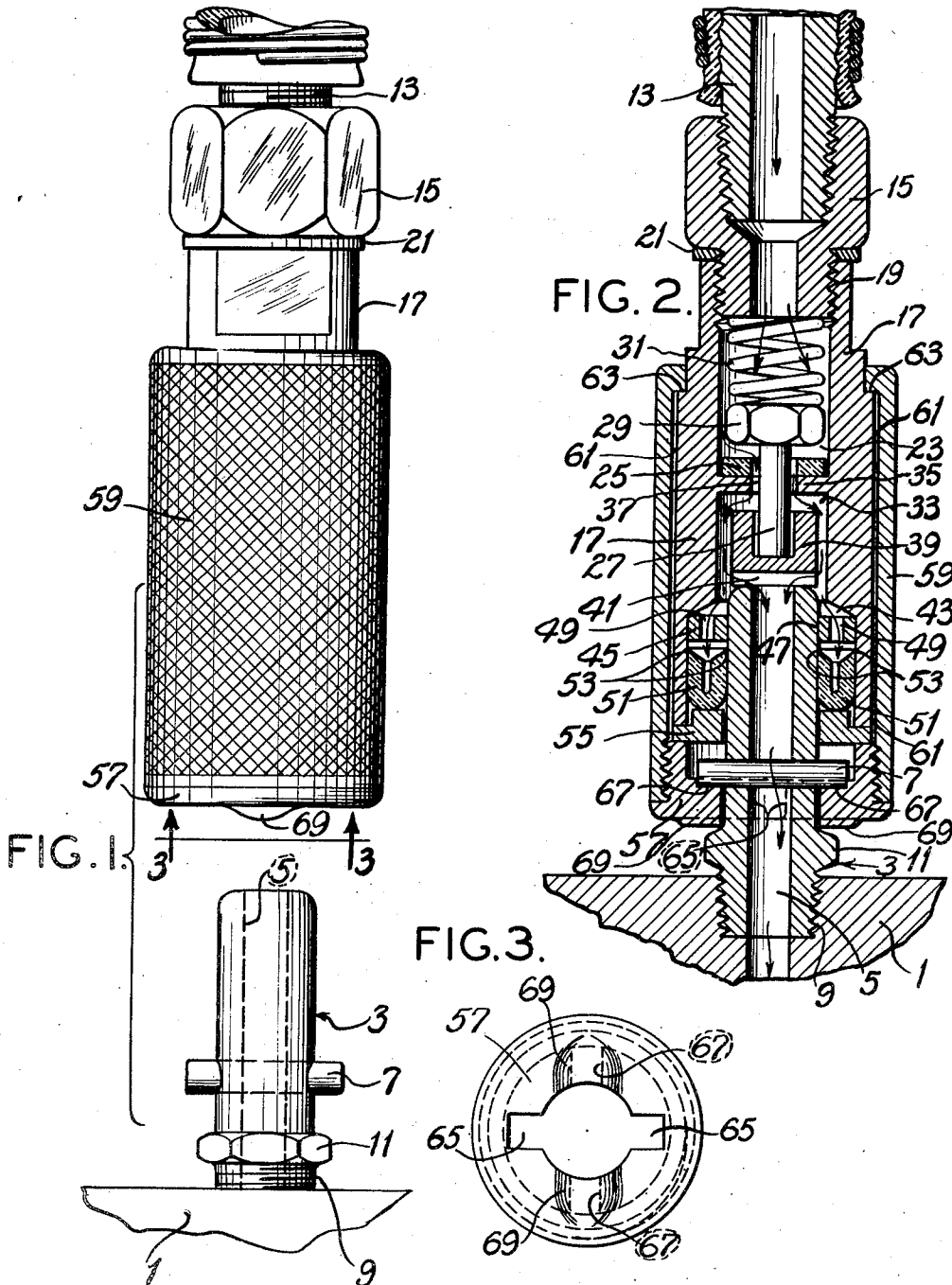
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CHUCK

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## UNITED STATES PATENT OFFICE

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## CHUCK

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This invention relates to chucks, and with regard to certain more specific features, to automatic chucks for coupling air lines and the like.

5 Among the several objects of the invention may be noted the provision of an automatic chuck for quickly attaching and detaching air hoses and the like to and from suitable fittings, the latter also comprising  
10 part of this invention; the provision of a chuck of the class described which opens automatically upon application and closes automatically upon the detachment; the provision of a device of this class which is  
15 automatically self-sealing when attachment is made; and the provision of a device of the class described which is simple and effective in operation and economical to manufacture. Other objects will be in part ob-  
20 vious and in part hereinafter described.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, in which is illustrated one of various possible embodiments of the invention.

Fig. 1 is a side elevation showing the chuck in the process of being applied to a fitting;

Fig. 2 is a longitudinal section of the  
35 chuck; and,

Fig. 3 is a bottom plan view of the chuck, the same being taken substantially along and viewed from line 3—3 of Fig. 1.

Similar reference characters indicate corresponding parts throughout the several  
40 views of the drawing.

Referring now more particularly to Fig. 1, there is illustrated at numeral 1 apparatus which it is desired to provide with compressed air or the like, said apparatus 1 having thereon a fitting 3 comprising a hollow stem 5, crosswise of which is located an inserted pin 7 forming bayonet trunnions. The fitting 3 is provided at its lower end  
50 with suitable attaching threads 9 and a

polygonal portion 11 for wrench applying purposes. It is to fittings of this general nature that the chuck herein described is to be applied, said chuck to be automatically opened to deliver air to the fitting 3 when  
55 applied thereto, and to automatically effect a definite seal against air leakage during this period.

At numeral 13 is shown the outlet from a pressure air hose. Threaded to the outlet  
60 13 is a nipple 15 to which is attached a body portion 17, the attachment being made by means of threads 19 and a suitable packing gasket 21.

The body portion 17 is interiorly counter-  
65 bored as shown at numeral 23, for the reception of a resilient valve seat 25, and a valve having a stem 27 and a head 29, the head being acted upon by means of a spring 31, the latter reacting against said nipple  
70 15. When the chuck is in the position shown in Fig. 1, the spring 31 normally holds the head 29 against the seat 25, thus sealing off flow of air from the air hole. Thus, automatically, no air is released when  
75 the chuck is disconnected.

Below said counterbore 23 is a second counterbore 33, said counterbores 23 and 33 being separated by a wall 35. The valve stem 27 passes loosely through a suitable  
80 opening 37 in the valve seat 25, and said wall 35.

In the lower counterbore 33, said valve stem 27 is provided with a head 39 having a milled slot 41 on its bottommost face. A  
85 third and larger counterbore 43 forms an extension of the counterbore 33 and contains therein a washer 45. The washer 45 is provided with a central opening 47 forming a slidable guide for the fitting 3 when  
90 the chuck is applied thereover. The washer 45 also has a series of peripheral openings 49 for permitting access of air under pressure sidewardly of the fitting. This air performs the function of sealing itself and  
95 the air behind it against leakage, this being accomplished by its pressing against the concave portions of an annular washer or guide 51, said washer having a U-shaped cross-section with a feather or equivalent edge 53. 100

The concave portion of the U-shape faces the direction of air pressure. The packing or gasket 51 has an interior opening there-through which is substantially equal to the diameter of the opening 47 in the washer 45. A holder 55 is provided for the gasket 51, said holder 55 being backed up by a threaded cap 57 located in the end of a swivel barrel or body portion 59, the latter being knurled for gripping purposes. The outer body 59 is rotatably borne on the inner body 17 along a bearing 61 and is prevented from assuming endwise movements by a flange 63 and said cap 57.

It will be seen by examining Fig. 2 that the lower head 39 of the valve stem 27 is adapted to engage the upper end of the fitting 3 when the chuck is applied thereover, and by pressing the valve against spring 31 serves to open said valve. This permits the flow of air through the valve and into the fitting 3 by way of said milled slot 41.

Some of the air is also by-passed to the exterior of the fitting 3 where it tends to spread the U-shaped, lipped gasket 51 into sealing position against the fitting 3. It is clear that when the chuck is removed, the valve automatically closes, thus also closing off the supply of air behind the gasket 51. Hence the gasket is easy to apply over the next fitting to be provided with air. It is clear that by a bayonet connection there is herein intended one in which longitudinal and rotary movement is used for effecting a connection.

In order to effect a definite connection with the fitting, the cap 57 is provided with bayonet notches 65 for passage around the bayonet pin 7 and interior bayonet recesses 67 at right angles thereto for receiving the bayonet pin 7 upon a ninety degree rotation. The spring 31 provides part of the reaction for maintaining the head 57 up against the cross pin 7 when the latter is positioned in the interior notches 67. The air pressure likewise is a factor in holding the coupler in place in addition to the spring, as it exerts pressure over the area of the wall of the fitting.

In order that an operator may sense about where the interior notches 67 are, exterior raised portions 69 are provided opposite them, so that the positions of the interior notches are known by sight as well as the clicking sound accompanying seating of the pin.

To operate the device, it is only necessary to grasp the knurled outer body 59 and apply the bayonet opening 65 around and over the bayonet pin 7 and thus cause an engagement between the lower valve head 39 and the upper end of the fitting 3. The valve is thus automatically opened. At the same time the body 59 is twisted so that the bayonet pin 7 assumes a position in the interior

recesses of 67, the spring 31 providing the necessary reaction to hold the same in place.

As the above action is effected, the air rushes into the fitting, due to the instantaneous opening of the valve. At the same time it rushes in behind the gasket 51 and causes the said gasket to seal itself against the fitting 3 and prevent leakage of air.

Among the advantages of the invention are the fact that there is a positive seal against leakage and this seal is effected substantially only when the gasket is in its proper position on the fitting 3. Thus any friction due to sealing is not constantly present, and hence not so disadvantageous, when applying or removing the chuck to and from the fitting. Furthermore, a definite alignment of chuck fitting is assured in making a placement, this being accomplished by the guide head 57, guide washer or spider 45 and the gasket 51.

It will be observed that the valve 29 is not unseated or disturbed until after the sealing against the fitting is effected.

It will also be apparent that the function of the swiveling feature of the outer sleeve 59 and head or body 17 is to prevent disengaging against hose twist or movement when the coupling is engaged.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In combination, a bayonet fitting having a cylindrical exterior surface, a chuck adapted to cooperate with said fitting and comprising an inner body, an outer body, said bodies being relatively rotatable, the latter being adapted to cooperate with said bayonet fitting to effect a bayonet connection upon longitudinal and rotary motion, a valve within the inner body adapted to be automatically opened when said longitudinal motion is effected, and a recess in said inner body surrounding said fitting and having a gasket therein adapted to slidably cooperate with said cylindrical portion of the fitting, said gasket having a U-shaped cross section whereby air tending to leak exteriorly of the fitting causes the gasket to react and press against the inner body and the fitting when a connection is made but to relieve the reaction when a connection or disconnection is effected, and guiding means in said recess for engaging said fitting, said guiding means including at least one opening for effecting delivery of air to said gasket.

2. A chuck comprising a body, said body having a valve port therein, a spring-pressed valve adapted to close said port, means on said valve adapted to be engaged by that  
5 with which the chuck connects to open said valve, said body also having a recess surrounding that which is engaged, and a gasket in the recess, adapted to seal with that which is engaged, said gasket being adapted to in-  
10 crease its sealing effect as any tendency or air to leak is increased and comprising an annular member having a U-shaped cross section, the concave portion of which faces the direc-  
15 tion of air pressure, a guide opposite said concave portion having means for transmitting air to the gasket, and holding means on the convex side of said gasket.

3. In combination, a bayonet fitting having a cylindrical exterior surface, a chuck  
20 adapted to cooperate with said fitting and comprising an inner body, an outer body, said bodies being relatively rotatable, the latter being adapted to cooperate with said bayonet fitting to effect a bayonet connec-  
25 tion upon longitudinal and rotary motion, and a recess in said inner body surrounding said fitting and having a gasket therein adapted to slidably cooperate with said cy-  
30 lindrical portion of the fitting, said gasket having a cross section of such a form that air tending to leak exteriorly of the fitting causes the gasket to react and press against the fitting when a connection is made but  
35 to relieve the reaction when a connection or disconnection is effected, and guiding means in said recess for engaging said fitting, said guiding means including at least one opening for effecting delivery of air to said gasket.

40 In testimony whereof, I have signed my name to this specification this 28th day of November, 1931.

ALEXANDER P. FOX.

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