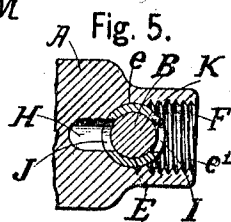
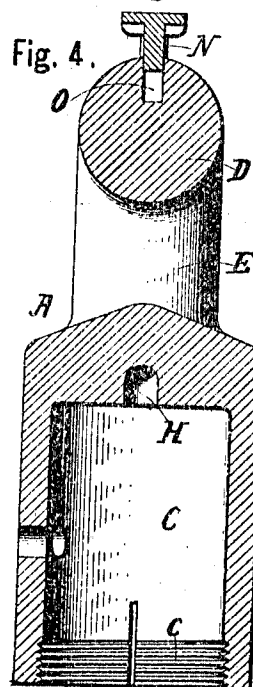
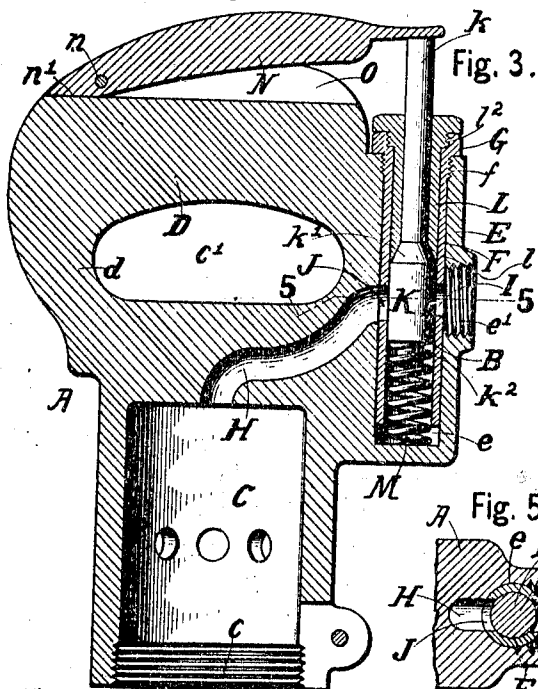
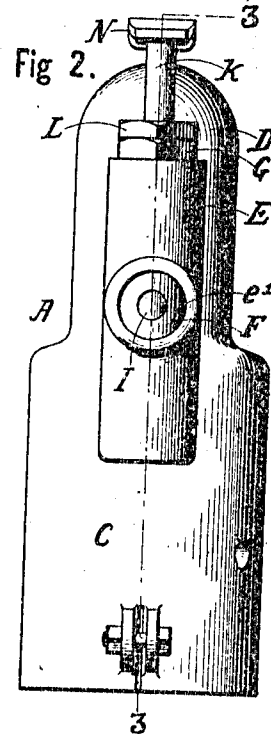
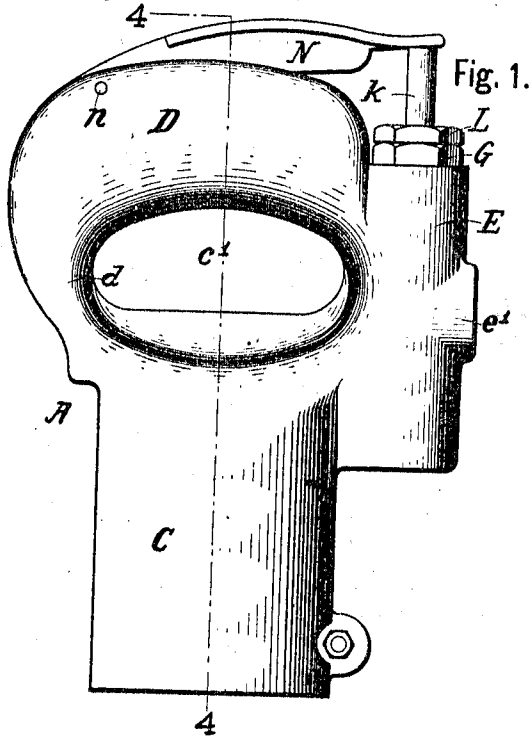


C. A. FAESSLER.
PNEUMATIC TOOL.
APPLICATION FILED DEC. 15, 1911.

1,054,343.

Patented Feb. 25, 1913.



Witnesses.
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PNEUMATIC TOOL.

1,054,343.

Specification of Letters Patent.

Patented Feb. 25, 1913.

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To all whom it may concern:

Be it known that I, CHARLES A. FAESSLER, a citizen of the United States, and resident of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Pneumatic Tools, of which the following is a specification.

My invention relates to pneumatic tools, and more particularly to the controlling-valve and its adjuncts.

The primary object of this invention is the production of a riveting, chipping, or other pneumatic tool, in which vibration is reduced to the minimum, and which is simple in construction, quick in action, and easily controlled.

Other objects are to provide a double closure against the leakage of air around the controlling-valve; to so construct said valve that the air passes through the valve-casing at a right-angle to the direction of movement of said valve; to provide the valve with a conical or tapered portion against which the motive agent acts to aid in opening the valve; to arrange the parts to opposite sides of the valve out of line so that the motive-agent will first act to depress the valve before it can enter the passage leading to the tool-cylinder; and to otherwise improve on pneumatic-tools as will be noted hereinafter.

To these ends the invention consists in the construction, arrangement, and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings, Figure 1 is a side elevation of a tool handle embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a longitudinal section, taken on line 3—3, Fig. 2. Fig. 4 is a longitudinal section, taken on line 4—4, Fig. 1. Fig. 5 is a transverse section taken on line 5—5, Fig. 3.

Referring now to the drawings in detail, corresponding letters of reference refer to corresponding parts in the several figures.

A designates the handle containing the controlling-valve B. The lower portion of the handle is hollow and preferably cylindrical, as at C, to receive the usual distribution-valve, or analogous device; and it is internally threaded, as at c, to receive a tool cylinder.

As the general operation of a pneumatic-tool is familiar to those skilled in the art, I have deemed it unnecessary to illustrate and enter into a detailed description of the distribution-valve, and the tool-cylinder and its contained parts, particularly since my invention is to be used in connection with the working parts of any of the various forms of pneumatic-tools.

The handle has a hand-grasp D which is in the form of a curved cylindrical cross-bar located above the hollow cylindrical portion C and separated from the latter by an intervening space *c*¹ through which the fingers of the operator may be passed, thus allowing him to conveniently take hold of said hand-grasp; said cross-bar being connected at one end to the cylindrical portion C by a reduced under-curved portion *d*, and at the other end by a substantially cylindrical boss E arranged parallel with said cylindrical portion and serving as a valve-casing. The latter has a cylindrical bore *e* which is closed at the bottom and open at its upper end; said upper end being internally threaded for connection with the threaded portion *f* of a bushing F which is inserted into the valve-chamber and extends to within a short distance from its bottom. The upper end of said bushing is enlarged and preferably made hexagonal, as at G, so that a wrench may be applied for properly and securely screwing it into place and for conveniently removing the same. Said bushing may be said to form part of the valve-chamber, and if desired may be omitted entirely, but I have found it more practicable to use the same, as an accurate fit between it and its contained parts can be obtained more easily than would be possible by placing said parts directly into the cylindrical-boss E. Moreover, the sleeve may be made of steel which is less liable to wear under the action of the controlling-valve and by thus providing a steel-bushing for the valve-chamber, the handle can be made of brass or any other suitable metal.

The valve chamber, or with more detailed reference the cylindrical-boss E has an internally threaded inlet opening *e*¹ into which may be screwed the fitting of a flexible-boss leading to the supply for the motive-agent, and connecting the hollow cylinder C with the interior of the boss E.

a passage H through which the motive agent is led to the distribution-valve usually employed in tools of this kind. The bushing F has an inlet-port I which registers with the inlet-opening e^1 in the valve-casing, and an outlet-port J out of direct line with said inlet-port and in registration with the passage H.

The controlling-valve B is movable within the bushing F and is machined to fit closely therein. Said valve comprising a body-portion K, a stem k , a conical portion k^1 between said stem and body-portion, and a stud k^2 at its inner end. Within the bushing of the valve-chamber is a sleeve L having a central bore through which the stem of the valve passes and from the outer end of which said stem projects. Said sleeve has the inner end of its bore flared or beveled to form a valve-seat l for the conical portion of the valve. Sleeve L is preferably provided with an enlarged head of hexagonal or other convenient shape for applying a wrench, and beneath said head it has a threaded portion l^2 which fits into the internally threaded upper end of the bushing. Between the bottom of the valve-chamber and the body of the valve, a coil spring M is interposed which has its upper end surrounding the stud k^2 whereby it is centered to assure free action and prevent cramping. Said spring acts to maintain the valve in its closed position, and in order to open the same with a view of actuating the working parts of the tool, said valve must be opened by manual effort. This is accomplished by means of a lever N movable within a groove O in the hand-grasp of the handle. Said lever is secured within said groove by means of a pivot-pin n passing through it at one end and through openings in the hand-grasp; the lever extending in the rear of said pivot-pin, as at n^2 , and having its lower edge at this point serving as a stop to limit the upward movement of its forward free end, in consequence of which the outward movement of the valve is also limited, owing to the lever bearing with its free end against the upper projecting end of the stem of said valve.

By constructing the valve-operating lever in the manner described, it extends lengthwise of the hand-grasp and can most conveniently be operated by pressure of the hand, instead of the thumb as has heretofore been the practice; said action being more convenient and not so likely to tire the operator. Moreover, considerable more pressure can be exerted with the hand than by the use of the thumb alone and with much less effort; and owing to the inlet and outlet-ports of the valve-chamber being arranged out of accurate registration, depression of said operating lever causes the valve

to be moved inward against the action of the spring M, resulting in a partial opening of the inlet port while the outlet-port is still closed, thus admitting the motive-agent into the chamber between the conical portion of the valve and its seat; the motive-agent acting instantly against said conical portion to depress the valve and aid the operator in the controlling of the tool. Owing to the motive-agent being under considerable pressure, the valve acts quicker and more positive than could be done by manual effort alone.

By providing the valve at the upper end of the body-portion with a tapered or conical portion, and supplying a valve-seat therefor, leakage of the motive-agent along the stem of the valve is impossible. This also aids in rendering the valve quick-acting and positive in its movements.

By means of the construction herein shown and described, vibrations of the tool are reduced to a minimum, and the parts subjected to the least possible wear.

It is clearly apparent that various changes fully embodied within the scope of my invention may be resorted to, and I do not wish to be limited to the exact construction herein shown and described.

I claim,—

1. In a pneumatic-tool, the combination of a handle having a cylindrical valve chamber provided with a single inlet-port and an outlet-port, said ports being arranged out of line, and a valve reciprocal in said chamber and acting to partially open the inlet-port before opening the outlet-port.

2. In a pneumatic-tool, the combination of a handle having a cylindrical-valve chamber provided with a single inlet-port and an outlet-port, and a valve movable within said chamber, said valve and the ports of said chamber being so related that during the movement of said valve the outlet-port is closed while the inlet-port is partially opened.

3. In a pneumatic-tool, the combination of a handle having a valve-chamber provided with a single inlet-port and an outlet-port, and a valve movable in said chamber to control the passage of the motive-agent therethrough, said valve and the ports of said chamber being so related that during the movement of said valve the inlet-port is partially opened while the outlet-port is closed.

4. In a pneumatic-tool, the combination of a handle having a valve-chamber provided with a single inlet-port and an outlet-port, said ports being arranged out of line, and a valve reciprocal in said chamber and acting to close the outlet-port before entirely closing the inlet-port.

5. In a pneumatic-tool, the combination of a hand-grasp, a valve-chamber having a

single inlet-port and an outlet-port, a valve reciprocal in said chamber and spring-controlled to normally close said ports, and means for manually counteracting the

5 spring-pressure to open said ports, said ports and the valve being so arranged that one port is entirely opened before the other.

6. In a pneumatic-tool, the combination of a hand-grasp, a valve-chamber having a
10 single inlet-port and an outlet-port, a valve reciprocal in said chamber and spring-controlled to normally close said ports, and means for manually counteracting the
15 spring-pressure to open said ports, said ports and the valve being so arranged that one port is entirely closed before the other.

7. In a pneumatic-tool, the combination of a hand-grasp, a valve-chamber having a single inlet-port and an outlet-port; a valve
20 movable in said chamber and spring-pressed to normally close said ports, and means for manually actuating said valve against the spring-pressure to cause said ports to be opened; said valve being so arranged that
25 when the inlet-port is partially opened, the motive-agent aids in the opening of said valve.

8. In a pneumatic-tool, the combination of a valve-chamber having an inlet-port and
30 an outlet-port at diametrically opposite points arranged slightly out of line and a beveled valve-seat, a valve normally closing said ports and having a stem protruding from one end of said chamber and a conical
35 portion normally seated against said valve-seat to prevent leakage of the motive fluid along said stem, and means to manually actuate said valve to cause it to move from
40 said seat and to open said ports, said inlet-port being partly uncovered during the movement of said valve before the latter acts to uncover the outlet-port.

9. In a pneumatic-tool, the combination of a cylindrical valve-chamber having an
45 inlet-port and an outlet-port at diametrically opposite points and a beveled valve-seat, said ports being arranged so that one is closer to the outer end of said chamber than the other; a valve having a conical portion and being spring-pressed to close said
50 ports and to seat said conical portion against said valve-seat, and means to move said valve toward and from said valve-seat; said inlet-port being partially uncovered during
55 the movement of said valve from said seat before uncovering the outlet-port and the latter being entirely covered during the movement of the valve toward said seat before entirely covering the inlet-port.

10. In a pneumatic-tool, the combination of a valve-chamber having an inlet-port and an outlet-port, a spring-pressed valve having a conical portion, and means to depress
60 the valve manually; said conical portion of the valve being brought into line with the

inlet-port before the outlet-port is opened so that the motive-agent enters the valve-chamber and is confined to aid in depressing the valve.

11. In a pneumatic-tool, the combination
70 of a handle having an integral valve-casing provided with a single inlet-opening and a passage extending from the interior of said casing through the handle, a bushing in said casing having an inlet-port in registration
75 with said inlet-opening and an outlet-port in registration with said passage, a spring-pressed valve reciprocal in said bushing and normally closing said ports, and means
80 whereby said valve may be manually actuated to open said ports; the ports of said bushing being out of line so that during movement of said valve in one direction the inlet-port is being opened before the outlet-
85 port.

12. In a pneumatic-tool, the combination of a handle having an integral valve-casing provided with a single inlet-opening and a passage extending from the interior of said casing through the handle, a bushing in said
90 casing having an inlet-port in registration with said inlet-opening and an outlet-port in registration with said passage, a spring-pressed valve reciprocal in said bushing and normally closing
95 said ports, and means whereby said valve may be manually actuated to open said ports; the ports of said bushing being out of line so that during movement of said valve in one direction the inlet-port is being opened before the out-
100 let-port and during movement of said valve in its opposite direction the outlet-port is closed before the inlet-port.

13. In a pneumatic-tool, the combination of a handle having an integral valve-casing
105 provided with a single inlet-opening and a passage extending from the interior of said casing through the handle, a bushing in said casing having an inlet-port in registration with said passage, a spring-pressed valve re-
110 ciprocal in said bushing and normally closing said ports, and means whereby said valve may be manually actuated to open said ports; the ports of said bushing being out of line so that the outlet-port will be
115 closed before the inlet-port.

14. In a pneumatic-tool, the combination of a valve-chamber having a bushing and in-
120 let and outlet-ports, a sleeve fitted in one end of said bushing with its inner end acting as a valve-seat, a valve reciprocal in said bushing and normally seated against said valve-seat and closing said inlet- and outlet-ports, and means to manually unseat
125 said valve and also cause said ports to be opened.

15. In a pneumatic-tool, the combination of a valve-casing having an inlet-opening and a passage leading to the working parts
130 of the tool, a bushing removable in said cas-

ing having an inlet-port in registration with said inlet-opening and an outlet-port in registration with said passage, a sleeve removable in said bushing and having its inner end beveled, and a spring-pressed valve normally closing said ports and having a conical portion normally seated against said valve-seat and a stem passed through said sleeve and protruding from the outer end thereof.

16. In a pneumatic-tool, the combination of a valve-casing closed at one end and having an inlet-opening and a passage for leading the motive-agent to the working-parts of the tool, a bushing threaded into said casing, and having an inlet-port in registration with said inlet-opening and an outlet-port in registration with said passage, a sleeve threaded into said bushing and terminating above the ports in the latter, the inner end of said sleeve being beveled to form a valve-seat, a valve having a conical portion adapted to be seated against said valve-seat and a stem passing through said sleeve and protruding from the outer end thereof, and a coil-spring within the bushing between said valve and the closed end of said casing.

17. In a pneumatic-tool, the combination of a handle having an integral valve-chamber provided with an inlet-opening and an outlet-opening, a bushing within said valve-

chamber, having an inlet-port and an outlet-port in registration with said inlet and outlet-openings, a sleeve entering one end of said bushing, a valve reciprocal within said bushing, a spring acting against the inner end of said valve, and means whereby said valve may be manually depressed to counteract the pressure of said springs.

18. In a pneumatic tool, the combination of a handle having an integral valve chamber provided with an inlet opening and an outlet opening, said openings being slightly out of alinement, a bushing within said valve chamber having an inlet port and an outlet port in registration with said inlet and outlet openings, a sleeve entering one end of said bushing, a valve reciprocal within said bushing and arranged to open and close both the inlet and outlet ports, a spring acting against the inner end of said valve, and means whereby said valve may be manually depressed to counteract the pressure of said spring.

In testimony whereof, I have this 6th day of December, 1911, affixed my signature in the presence of two subscribing witnesses.

CHARLES A. FAESSLER.

Witnesses:

JOHN B. PORTER,
D. H. HARPER.