1,238,255.

M. J. BURKEL
OPEN GRIP HANDLE, INSIDE TRIGGER PNEUMATIC TOOL
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Fig. 1

Fig. 2

Fig. 3

Witnesses:

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by 

Patentencia
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OPEN GRIP-HANDLE, INSIDE-TRIGGER PNEUMATIC TOOL.

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To all whom it may concern:

Be it known that I, MATHEW J. BURKEL, a citizen of the United States, and a resident of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Open Grip-Handles, Inside-Trigger Pneumatic Tools; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in open grip-handle, inside trigger pneumatic tools. The invention consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The object of the invention is to provide an open grip handle, having an inside trigger for controlling the admission of the pneumatic fluid, together with a valve mechanism so arranged that the handle and head may be made in a commercially practicable manner. The many advantages of the invention will appear as I proceed with my specification.

Referring to the drawings:

Figure 1 is a view representing a longitudinal section of a pneumatic hammer having an open grip handle provided with my improved inside trigger and admission valve.

Fig. 2 is a view representing a partial section through Fig. 1 in a plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of the trigger.

Referring now to that embodiment of my invention illustrated in the drawings, 10 indicates the body of a pneumatic tool, in this case the barrel of a pneumatic hammer; 11 indicates the piston or hammer longitudinally reciprocable therein; 12 indicates the tool at the end of the barrel; 13 indicates the head that closes the upper end of the barrel; and 14 indicates the operating valve mechanism (inclosed by the head) which receives the inlet and exhaust passages and ports in the barrel and head control the inlet and exhaust of the pneumatic fluid in such manner as to produce the reciprocation of the piston hammer in the barrel to operate upon the tool in a familiar manner.

The head proper 13 is of the usual form but is provided with an open handle 15 made tubular to provide a passageway 16 for the admission of the pneumatic fluid. The handle 15 is fabricated integrally with the head and is in the form of a prolongation 16 of one end of a boss 16 on the end wall 13 of the head and extending transversely of said end wall. The head with the handle extension 16 may be made as a drop forging, with the boss extension 16 in line with the boss 16 so that the extension may be bored, before bending the handle, from one end to produce the passageway 16 and may be bored from the opposite end to produce opening 16 that is to contain the casing or bushing for the admission valve now to be described.

17 indicates the valve bushing of the admission valve. This is a sleeve fitting snugly within the passageway 16 in the boss 16 and driven into place therein from the outer end of said passageway until it engages a shoulder 14 formed where the passageway 16 meets the smaller passage 16.

18 indicates the inlet port in the end wall 13 of the head for the supply of the pneumatic fluid to the operating valve 14. The valve bushing 17 has an annular groove in line with the port 18 which provides an annular space 19 about said bushing and communicating with said port. Annular spaced ports 20 connect the interior of the casing with the annular space 19.

21 indicates a piston valve plug which is adapted to reciprocate in the bushing 17 and to coat with the ports 20 therein. Said valve is normally closed on the ports 20 and, as shown, is spring controlled,—a spring 22 being interposed between the valve and a plug 23 which is threaded into the outer end of the bushing 17 to close the valve chamber. Both the valve plug and the closing plug 23 are provided with suitable recesses to seat the ends of the spring 22. The valve 21 has a stem 24 which is fixed to a head piece 25 that has sliding bearing in the valve casing. Said head piece is operatively engaged by a trigger 26 that is fulcrumed to swing in the plane of the handle. Said trigger is fulcrumed between spaced lugs 27—27 made integral with the handle and has an arm 29 which extends through aligned slots 16 and 17 and formed respectively in the boss 16 and bushing 17 to engage in a narrow slot or recess 28 formed in the head piece 25 of the valve stem in the plane of the said stem. The head piece is provided with channels 25—25 at either side of the
Said channels connect the passages 16 of the handle with the interior of the valve casing.

The trigger 26 has an operating arm 26° which is curved in a manner similar to the crook of a free end of the handle, so that it will normally be spaced short from the inside curve of said crook, the space being sufficient so that when the handle is gripped and the operating arm 26° is actuated by the fore-finger of the hand grasping the handle 15 there will be sufficient movement of the trigger to operate the valve 21.

The operation of my improved open grip inside trigger inlet valve control for pneumatic tools will be apparent from the foregoing description.

The pneumatic fluid is admitted to the passageway 16 in the handle by means of a flexible pipe or hose (not shown) which is attached to a free end of the handle in a familiar manner,—the said passageway 16 being threaded at its inlet end for that purpose. The valve plug 21 is normally held in position to close the ports 20, being held in this position by means of the spring 22 or by means of a pneumatic cushion formed by the leakage of the pneumatic fluid about the piston valve plug into the space between the said valve plug and the closed end plug of the valve bushing. With the valve plug in this position the trigger 26 stands in the position shown in dotted lines in Fig. 1 with its operating arm 26° hanging down somewhat away from the crook of the handle. The handle may be easily gripped without touching the trigger and the tool body may be manipulated as usual to bring the tool carried by it into the required position. The pressure of the fore-finger upon the operating arm of the trigger will swing the trigger from the dotted position to the full line position shown in Fig. 1. In this movement the arm 26° of the trigger swings the valve stem to the right (as it appears in Fig. 1) and moves the valve plug to uncover the ports 20 whereupon the pneumatic fluid passing through the channels 25° in the valve stem head piece into the space within the valve bushing about the valve stem 24, will thence pass through the ports 20 into the operating valve of the tool.

It will be noted that in my improved construction the passage 16 is so disposed in the handle 16° that the supply hose for the pneumatic fluid is attached to a free end of the handle which is recognized as the most convenient place for the attachment of said hose for reason that the hose is out of road of the operator in the use of the tool to which the handle is attached. It will also be understood as has been pointed out that since the handle 15 is made in the form of a prolongation of the boss on the end wall of the head 13 and since the passage 16 and the valve plug 17 are arranged as shown and heretofore described, the head 18 may be made as a drop forging with the handle 15 in direct alinement with the boss 70 16°. The passageway 16 and the opening for the passage 21 may be then bored from opposite ends of the part comprising the continuous boss and handle and the handle may thereafter be bent to proper form as shown in the drawings. This not only simplifies and cheapens the construction but also provides a construction of superior strength, viz. a construction made of a drop forging instead of cast metal as has been usual heretofore. In addition the improved construction and arrangement of the valve passage and of the valve mechanism obviates all transverse passageways in the handle proper and provides a handle which is of substantially the same breaking strength throughout. These and many other advantages of the improved head and handle will be manifest to those familiar with the art.

I claim as my invention:

1. A device of the kind described, comprising a head having an end wall provided with a lateral extension bent to form an open grip handle, said head having a transverse bore and said extension having a longitudinal bore which forms an endwise prolongation of the bore in said head and constitutes a passageway for the pneumatic fluid, a valve mechanism including a valve plug in the said bore of the head, and a trigger fulcrumed in the crook of said handle and having an arm extending into the said bore of the head to actuate said valve plug.

2. A device of the kind described, comprising a tubular head having an end wall, said end wall, being provided with a boss extending transversely thereof and with an extension prolonged beyond said head to form an open grip handle said handle having a longitudinal passageway for the pneumatic fluid and said boss having a longitudinal bore which meets said passageway, a valve bushing fixed in said boss, a valve plug reciprocable in said bushing, and a trigger fulcrumed in the crook of said handle and having an arm extending through said boss and said bushing and adapted for the operation of said valve plug.

3. A device of the kind described, comprising a tubular head having an end wall, said end wall having a boss extending transversely thereof and an extension prolonged beyond said head to a crooked handle, said handle having a longitudinal passageway for the pneumatic fluid and the said boss having a longitudinal bore which meets said passageway, a valve bushing fixed in said boss and said valve bushing and boss having a slot adjacent to the crook of the
handle, a valve plug reciprocable in said bushing, a trigger fulcrumed in the crook of said handle and having an arm extending through the slots in said boss and in said bushing, and said head piece having a channel or channels formed parallel to the plane of said recess for connecting the inlet passage in said handle with the interior of said valve bushing.

4. A device of the kind described, comprising a tubular handle having an end wall, said end wall having a boss extending transversely thereof and an extension prolonged beyond said head to a crooked handle, said handle having a longitudinal passageway for the pneumatic fluid and the said boss having a longitudinal bore which meets said passageway, a valve bushing fixed in said boss and said valve bushing and boss having a slot adjacent to the crook of the handle, a valve plug reciprocable in said bushing, a trigger fulcrumed in the crook of said handle and having an arm extending through the slots in said boss and in said bushing, and said head piece being provided with ports connecting the passageway of said handle with the interior of the valve bushing.

5. A device of the kind described, comprising a tubular head having an end wall, said end wall having a boss extending transversely thereof and an extension prolonged beyond said head to a crooked handle, said handle having a longitudinal passageway for the pneumatic fluid and the said boss having a longitudinal bore which meets said passageway, a valve bushing fixed in said boss and said valve bushing and boss having a slot adjacent to the crook of the handle, a valve plug reciprocable in said bushing, a trigger fulcrumed in the crook of said handle and having an arm extending through the slots in said boss and in said bushing, and said head piece being provided with ports connecting the inlet passage in said handle with the interior of said valve bushing, a supply port in the end hole of said head and said valve bushing having ports in line with said supply port.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 28th day of January A. D. 1916.

MATHEW J. BURKEL.

Witnesses:
A. F. McDOWELL,
T. H. ALFREDS.

Copies of this patent may be obtained for five cents each, by addressing the “Commissioner of Patents, Washington, D.C.”