

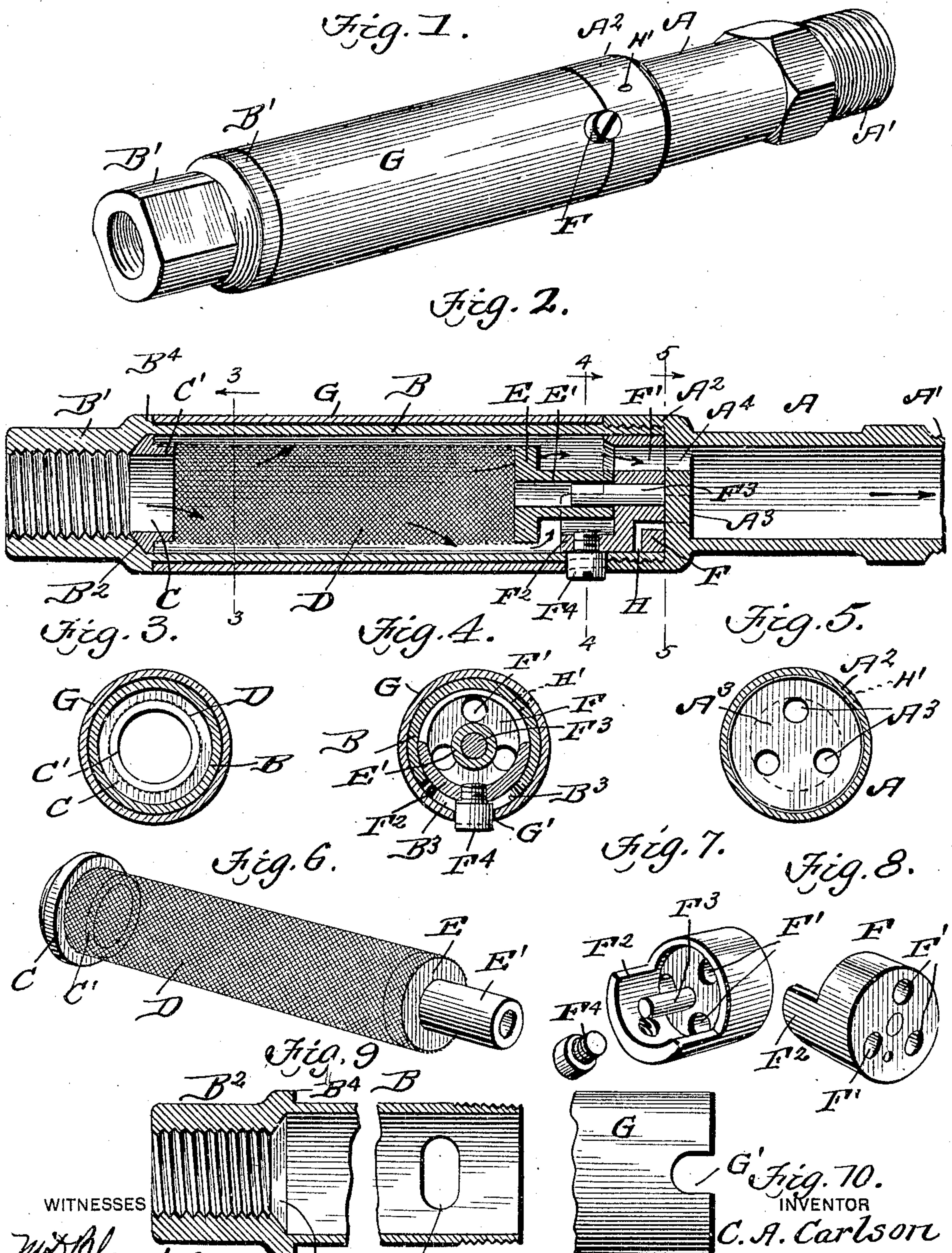
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C. A. CARLSON.

THROTTLE VALVE AND AIR STRAINER FOR PNEUMATIC DRILLS.

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WITNESSES
M. J. Blouet,
E. M. Venn.

Fig. 10.
INVENTOR
C. A. Carlson
BY
O'Leary & Brock,
ATTYS.

UNITED STATES PATENT OFFICE.

CARL ALBIN CARLSON, OF HOLYOKE, MASSACHUSETTS.

THROTTLE-VALVE AND AIR-STRAINER FOR PNEUMATIC DRILLS.

No. 844,776.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL ALBIN CARLSON, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented a new and useful Improved Throttle-Valve and Air-Strainer for Pneumatic Drills, of which the following is a specification.

This invention relates to an improved throttle-valve and air-strainer for pneumatic drills, and has for its object to provide a simple and efficient device by which the feed of the air to the tool may be quickly regulated or completely throttled.

A further object of the invention is to provide an air-strainer which will collect all the dust and dirt from the air before the air reaches the valve, and thus prevent any foreign particles from contact with the valve or valve-seat and assuring the perfect working of the valve at all times.

Still a further object of the invention is to provide a strainer of a greater area than the inlet or exhaust ports, so that all danger of the strainer becoming clogged by the dirt collected and the feed of air being retarded is reduced to a minimum.

With these briefly-stated objects in view the invention also comprises certain details of construction and peculiar combination and arrangement of parts, as will be fully set forth in the following specification and pointed out in the claims, reference being had to the drawings, in which—

Figure 1 is a perspective view of my improvement. Fig. 2 is a longitudinal sectional view of the same, showing the valve open. Figs. 3, 4, and 5 are detail cross-sectional views drawn on the lines 3-3, 4-4, and 5-5, respectively. Fig. 6 is a detail view in perspective of the strainer. Figs. 7 and 8 are detail perspective views of the valve. Fig. 9 is a detail sectional view of the cylinder, illustrating the seat for the end of the strainer; and Fig. 10 is a detail side view of one end of the operating-sleeve.

In the drawings I have illustrated only such parts of a tool to which my invention relates, as the invention is applicable to many styles or types of pneumatic tools, and its application to any particular form is thought unnecessary.

By reference to the drawings, A designates a tube having one end externally threaded, as at A', to facilitate connection to the drill, and

at the opposite end the tube is provided with a threaded flange A², at the base of which is arranged a partition A³ within the tube, which is provided with a series, preferably three, of ports A⁴, the outer surface of the partition being ground perfectly flat to provide a valve-seat. Threaded into the collar A² is a cylinder or casing B, the opposite end of which terminates in a collar B', having its exterior provided with a wrench-surface and its interior with screw-threads by which the cylinder is connected to the motor. The inner end of the collar adjacent the body of the cylinder is beveled and ground to provide a seat B², upon which is seated a flanged ring C. Upon the flange C' is held one end of a foraminated cylinder D, which may be a screen or a solid body with a number of minute perforations, and within the opposite end of this cylinder is held a disk E, from which projects a tubular extension E', which bears at its outer end against a valve F, that is arranged within the cylinder and bears against the partition A³ in the tube.

The valve F is provided with a series of ports F', which are designed to be brought into register with the ports A⁴ and of course has its inner surface ground smooth to permit the valve to snugly fit against the valve-seat. The outer edge of the valve is provided with an extension or flange F², that extends about half-way around its periphery, and projecting centrally from the valve is a stem F³, which projects into the tubular extension E' of the disk E, and provides a support for the end of the foraminated cylinder to hold it concentrically within the cylinder or casing.

The extension or flange of the valve is provided with a threaded aperture in which is held a screw F⁴, the head of which projects through a slot B³, formed in the cylinder, and snugly fits within a short slot G', produced in the end of an operating grip-sleeve G, which is arranged upon the cylinder or casing and held between the collar A² and a shoulder B⁴, produced exteriorly at the inner end of the collar B'.

By reference to Fig. 2 of the drawings it will be seen that the foraminated cylinder is held securely within the cylinder or casing and securely holds the valve to its seat irrespective of the position of the cylinder and the pressure of air from the motor.

The valve F is provided with an oil-port H,

which is designed to register with one of the ports A^4 in the partition A^3 in the tube A, and when turned out of register the port communicates with ports H' in the threaded flange A^2 and in the end of the sleeve B. This arrangement permits oil being fed into the tube A, from whence it is communicated to the drill-tool, it being understood that when the port H registers with port A^3 the valve will close the ports H' ; but when the valve is reversed to open the ports A^3 the ports H' will be open, permitting access to the oil-port H, and which may be filled with oil.

From the foregoing it will be readily seen that I provide an exceedingly cheap, simple, and efficient device of the kind stated, and it will be readily understood that as the air comes from the motor it will first pass through the foraminated cylinder or strainer, which will collect all foreign particles in the air before it reaches the valve, and is allowed to enter the tool, and by simply revolving the sleeve the valve is rotated and the supply of air to the tool may be quickly regulated or completely throttled.

The flange or extension of the valve is designed to completely cover the slot B^3 in the cylinder or casing irrespective of the rotary position of the valve, and the ends of the slot also provide stops to limit the rotary movement of the valve.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a casing having an annular seat adjacent one end and a valve-seat adjacent its opposite end, a valve rotatably held within the casing and coacting with the valve-seat, and a foraminated cylinder concentrically arranged within the casing and having one end engaging the said annular seat and its opposite end the valve, substantially as specified.

2. In a device of the kind described, the combination with a tube having a valve-seat, of a cylinder or casing connected to the tube, a valve rotatably held within the cylinder and engaging the valve-seat and a foraminated cylinder arranged concentrically within the said cylinder or casing and closed at the end adjacent the valve.

3. In a device of the kind described, the combination with a tube having a valve-seat at one end, of a cylinder or casing connected at one end to the tube and having its opposite end provided with an internal beveled seat, a valve rotatably held within the cylinder and bearing against the valve-seat, a foraminated cylinder arranged within the cylinder or casing, said foraminated cylinder bearing at one end against the beveled seat and at its opposite end against the valve, and means for operating the valve.

4. In a device of the kind described, the combination with a tube having a partition arranged at one end and in which is arranged a series of ports, the outer surface of the partition being ground to provide a valve-seat, of a cylinder or casing connected at one end to the tube and having its opposite end provided with an internal beveled seat, a valve rotatably held within the cylinder and bearing against the partition, said valve having ports which are designed to register with the ports in the partition, a foraminated cylinder having one end provided with a flanged ring, the outer surface of which is beveled to snugly fit the seat in the cylinder, and its opposite end provided with a tubular extension into which extends a stem projecting from and carried by the valve, an extension or flange extending from the valve and having a bolt projecting therefrom which extends through a slot in the cylinder, and a sleeve rotatably held upon the cylinder and having a recess through which the end of the bolt extends for the purpose specified.

5. A device of the kind described comprising a tube having a partition adjacent one end in which is arranged a series of ports and a threaded collar projecting from the tube adjacent the partition, a cylinder or casing connected at one end to the threaded collar and having its opposite end terminating in an internally-threaded collar, the inner end of which adjacent the body of the cylinder, is beveled to provide a seat, a disk valve rotatably held within the cylinder and against the said partition, said valve having a series of ports which are designed for registering with the ports in the partition, a foraminated cylinder, arranged within the cylinder or casing, said foraminated cylinder having one end provided with a flanged sleeve, the outer end of which is beveled to snugly fit the seat at the end of the threaded collar, the opposite end of the foraminated cylinder being closed by a disk having a tubular extension, the end of which bears against the valve and into which extends a stem carried by the said valve, an extension or flange formed upon the valve and having a screw connected thereto which projects through a slot formed in the cylinder and into a recess produced in the end of a sleeve that is revolvably retained upon the cylinder, the said extension or flange of the valve being designed to close the slot in the cylinder irrespective of the rotary position of the valve.

6. In a device of the kind described the combination with a casing having a valve-seat adjacent one end, of a valve cooperating with the seat and having a stem, a foraminated cylinder arranged within the casing and provided at a point adjacent the valve with a tubular guide to receive the said stem.

7. In a device of the kind described, the

combination with a casing having an annular seat adjacent one end and a valve-seat adjacent its opposite end, of a valve rotatably held within the casing and coacting with the
5 valve-seat, a foraminated cylinder held within the casing and having one end engaging the said annular seat and its opposite end en-

gaging the valve and a sleeve held upon the casing and adapted for operating the valve substantially as specified.

CARL ALBIN CARLSON.

Witnesses:

A. K. WHEELER,
JOHN MORLIN.