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PATENTED MAR. 12, 1907.

W. T. SEARS.

PLUNGER CLEANING MEANS FOR FLUID OPERATING MACHINES.

APPLICATION FILED MAR. 17, 1906.

Fig. 1.

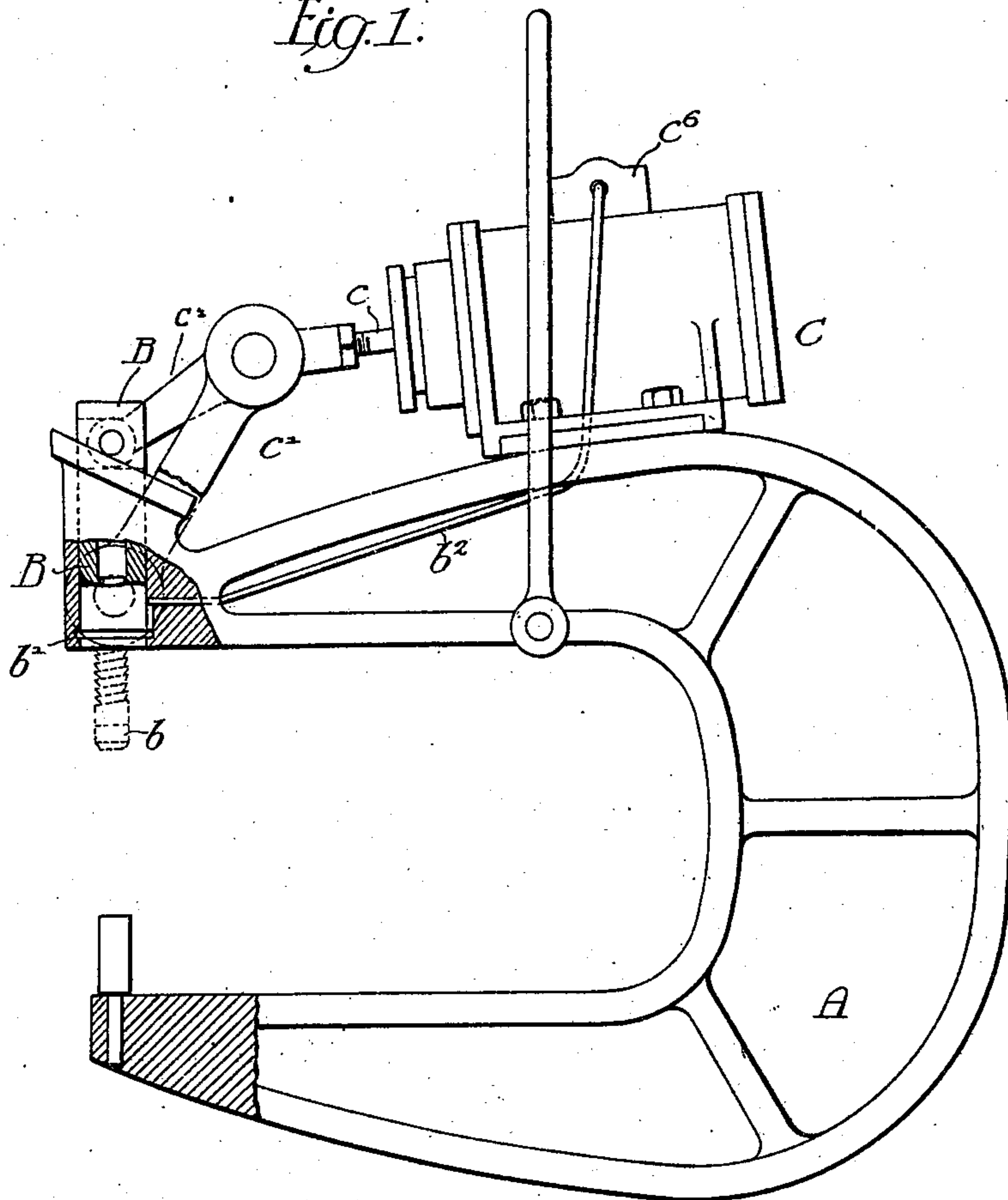


Fig. 2.

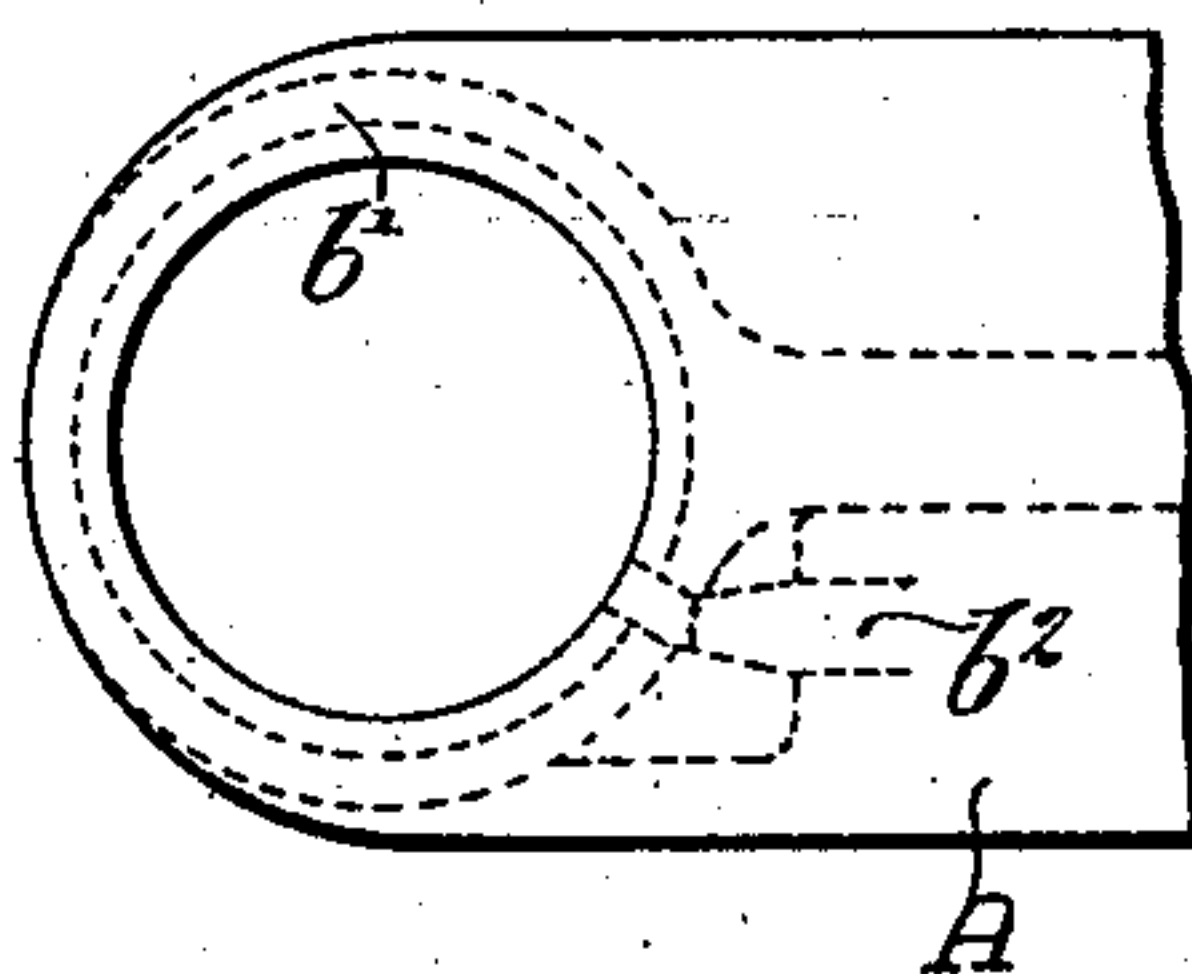
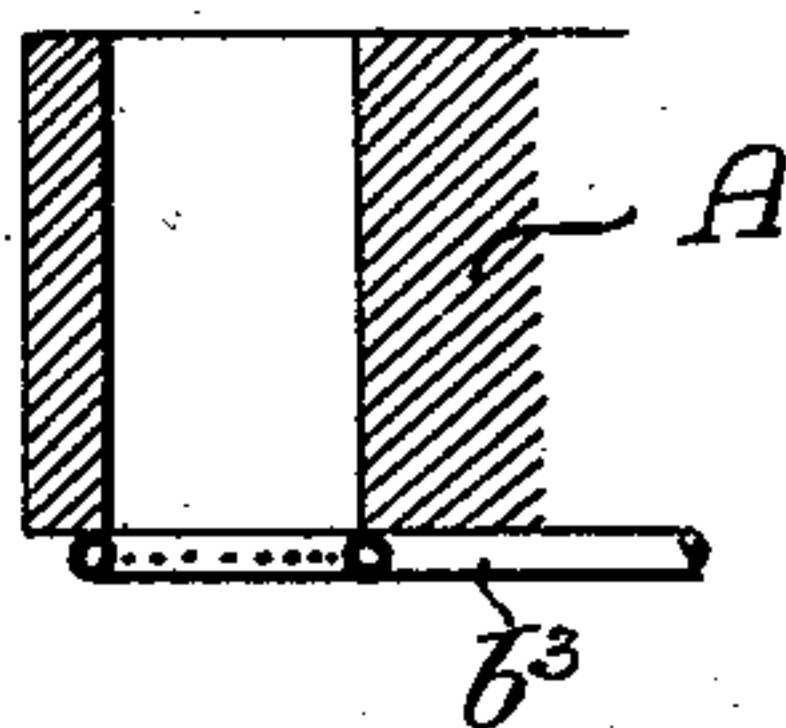


Fig. 3.



Witnesses:
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PLUNGER-CLEANING MEANS FOR FLUID-OPERATING MACHINES.

No. 847,119.

Specification of Letters Patent.

Patented March 12, 1907.

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To all whom it may concern:

Be it known that I, WILLARD T. SEARS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Plunger-Cleaning Means for Fluid-Operated Machines, of which the following is a specification.

The object of my invention is to prevent the gathering of scale or other foreign bodies by the plunger of fluid-operated machines, such as riveters, and the drawing of such bodies into the cylinder or guides in which said plunger operates, it being desired to avoid or obviate the cutting of the cylinder or guides and the plunger by such foreign bodies in machines of the type above noted. This object I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation illustrating, partly in vertical section, the application of my invention to a well-known form of fluid-operated machine. Fig. 2 is an inverted plan view of a portion of the frame of the machine illustrated in Fig. 1 further illustrating the invention, and Fig. 3 is a vertical section of a modified form of my invention.

In carrying out my invention, I provide means whereby fluid is directed upon the plunger or riveting-head as it is being drawn into its cylinder or guides, such fluid being in one of the cases illustrated obtained from the exhaust of the operating-cylinder of the machine, though, if desired, it may be delivered from any other available source.

In the above drawings, A is the frame of the riveting-machine, one branch of which carries the fixed die *a*, while the other carries a sliding plunger or head B, to which is fixed the second or movable die, (illustrated in dotted lines at *b*.) It is immaterial whether this sliding plunger be structurally independent of the operating-piston or whether, as in the other well-known types of machines, it is integral with or directly attached to a piston supported immediately over it. In any case I provide an annular cavity *b'*, formed in the frame A adjacent to the lower portion of the plunger-guides, connecting this by means of a pipe *b²* to a source of supply of fluid under pressure, in the present instance the exhaust-port of the cylinder-casing C. The piston operative in said cylinder-casing is connected to the plunger B through any suitable mechanism, in the present instance consisting of a piston-rod *c*, pivoted to one arm of a link *c'*,

which is in turn pivoted to the frame A. A second link *c²* extends from the point of junction of the piston-rod *c* and the link *c'* to the plunger B. Under operating conditions when the valve in the chest *c⁶* has been moved to exhaust the motive fluid, such as air, from the cylinder C after a working stroke has been made a portion of this exhaust-air passes through the pipe *b²* into the cavity *b'* and is discharged outwardly around the plunger B, so as to remove all foreign bodies from the surface thereof as it is drawn into its guides.

If desired, I may provide an annular conduit *b³*, as shown in Fig. 3, supported in such manner adjacent to the plunger as to direct fluid upon it from perforations formed as illustrated. This pipe may be connected to the engine-exhaust, as shown in Fig. 1, or may receive its supply from any other available source.

The need for such a device as that above described will be best understood when it is remembered that riveting-machines of the character illustrated are usually of the portable type and are frequently used in such a position that any scale falling upon the plunger tends to remain there by gravity until drawn into the guides or otherwise displaced.

By discharging the exhaust or, if desired, high-pressure motive fluid against the plunger as the latter is being drawn into the guides after having been extended to make a working stroke I very effectually keep its surface free from scale, sand, &c., thereby avoiding the damage commonly occurring in tools of this class.

I claim—

1. The combination of a fluid-operated tool having a guide and a reciprocatory member movable therein, there being a portion of said member placed to intermittently engage the guide, with means for delivering fluid upon said portion of the reciprocatory member to remove foreign bodies therefrom, substantially as described.

2. The combination of a fluid-operated tool having a reciprocatory portion and a guide therefor, means connected to a source of fluid under pressure for delivering such fluid to said reciprocatory portion, with means for causing such delivery of fluid only at such time as the reciprocatory portion is being drawn into its guide, for the purpose of removing foreign bodies from its surface, substantially as described.

3. The combination in a fluid-operated

machine having a reciprocatory plunger and a frame provided with guides for said plunger, of a device for delivering fluid under pressure to said plunger in an annular stream
5 around the same after each working stroke, substantially as described.

4. The combination with a fluid-operated tool, a plunger and guides therefor, of an engine for actuating said plunger, there being
10 an annular cavity surrounding the plunger and opening onto the surface thereof, said cavity being connected to a source of fluid under pressure, substantially as described.

5. The combination with a fluid-operated
15 tool having a plunger and guides, of an engine for actuating said plunger, there being an annular cavity surrounding the plunger and discharging onto the surface thereof, and a pipe connecting said cavity with a source of

fluid under pressure, the parts being arranged
20 to cause a discharge of fluid onto the plunger each time the latter is drawn into its guides, substantially as described.

6. The combination of a fluid-operated tool having a reciprocatory portion and a
25 guide therefor, with means for delivering fluid from within the guide to said reciprocatory portion in such manner as to remove foreign bodies from its surface, substantially
30 as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLARD T. SEARS.

Witnesses:

WILLIAM E. BRADLEY,
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