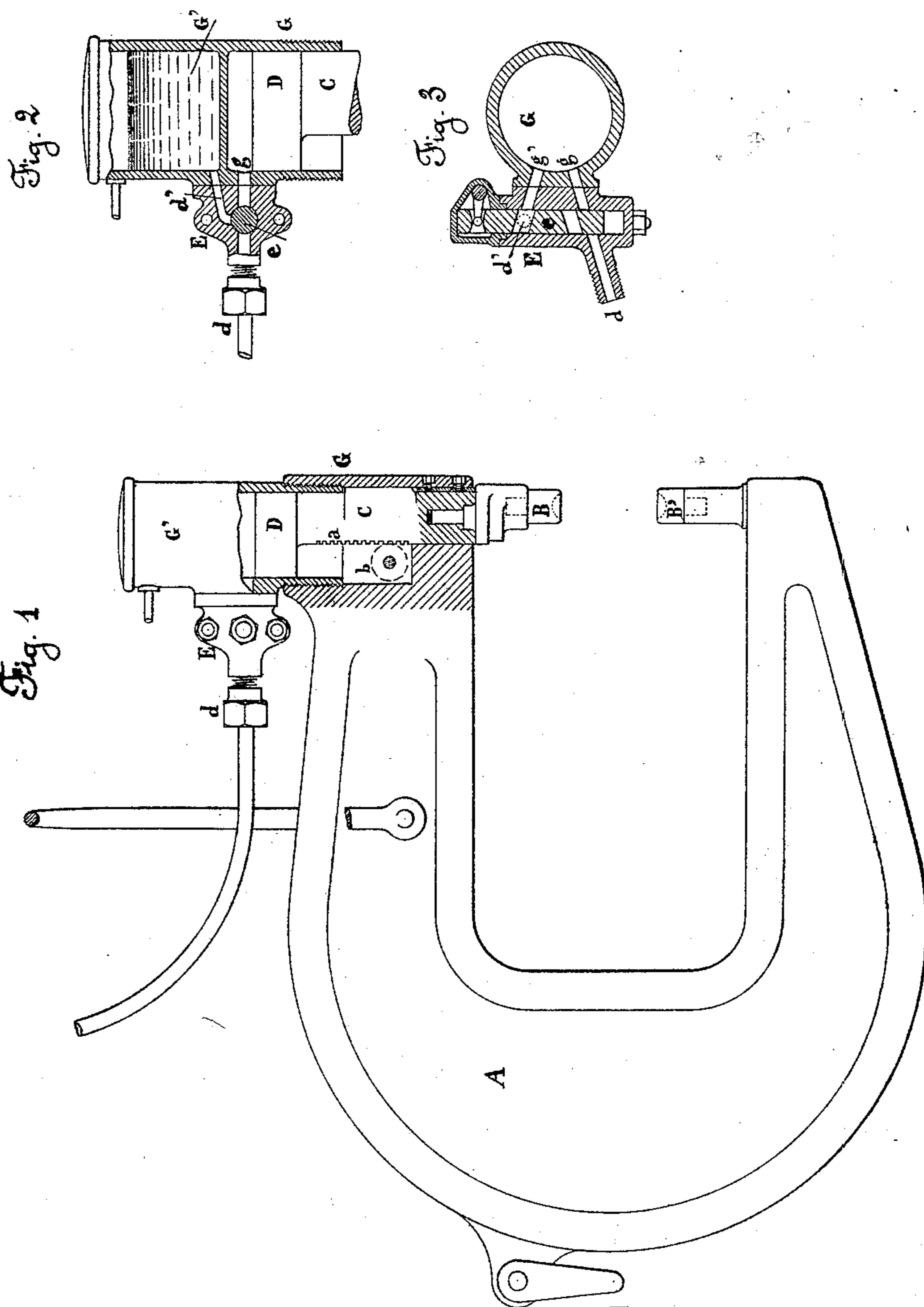


(No Model.)

L. DELALOE & A. PIAT.
RIVETING MACHINE.

No. 409,393.

Patented Aug. 20, 1889.



Attest:

James F. DuKamel
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their Attys.

UNITED STATES PATENT OFFICE.

LÉON DELALOE AND ALBERT PIAT, OF PARIS, FRANCE.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,393, dated August 20, 1889.

Application filed May 26, 1887. Serial No. 239,594. (No model.) Patented in Belgium August 25, 1885, No. 69,999; in France December 7, 1885, No. 172,754; in Germany March 13, 1886, No. 37,341; in Austria-Hungary March 15, 1886, No. 11,600; in Luxemburg March 15, 1886, No. 661; in Italy March 31, 1886, No. 19,702, and in Spain April 10, 1886, No. 9,550.

To all whom it may concern:

Be it known that we, LÉON DELALOE and ALBERT PIAT, of Paris, in the Republic of France, have invented certain new and useful Improvements in Riveting-Machines, (for which we have received Letters Patent in Belgium, August 25, 1885, No. 69,999; France, December 7, 1885, No. 172,754; Germany, March 13, 1886, No. 37,341; Austria-Hungary, March 15, 1886, No. 11,600; Luxemburg, March 15, 1886, No. 661; Italy, March 31, 1886, No. 19,702, and Spain, April 10, 1886, No. 9,550,) of which the following is a specification.

The object of our improvements is the same as that explained in an application for patent filed by us November 16, 1886, Serial No. 219,102, referring, however, to the case when the compressed water is generated and furnished to the machine by accumulators.

The improvements are represented in Figures 1, 2, and 3 of the accompanying drawings, Fig. 1 being a view of the whole machine in elevation, while Figs. 2 and 3 are respectively a vertical and horizontal section through the axis of distribution.

The frame A has the ordinary swan's-neck shape, as already illustrated in our previous application. The particular arrangements for operating by hand the rod C of piston D, so as to make it perform the first part of its stroke down the cylinder G', up to the point when the dies B B' begin to work, and for raising said piston, are also described and claimed in our previous application.

It is the object of our improvements to combine the working-piston D, such as we have constructed it, with a distributing mechanism E, which serves, first, to admit the water from the accumulator upon piston D, said piston having been previously lowered by hand, and, secondly, to allow the water after having done its work to escape through the reservoir G', which has an opening to the outside and always contains a quantity of water sufficient to fill the space left empty by that part of the descent of the piston which is effected by

hand. The water from the accumulator arrives through the channel *d*, and enters the cylinder G as soon as the opening in piston *e* stands opposite the openings *d g*. After being used the water escapes, through the channels *g' d'*, into the reservoir G', from where it can flow out, the piston *e* having now a different position.

The machine is operated as follows: By means of piston *e* of the distributing mechanism E the reservoir G' is made to communicate with cylinder G. Then piston D is lowered by hand with the aid of rack *a* and pinion *b* until the rivet is firmly grasped by the two dies B B'. At this moment piston *e* is pushed back so as to shut off all communication between cylinder G and reservoir G', and the compressed water from the accumulator is admitted through channel *d* on piston D, which will now perform the crushing of the rivet. When this is accomplished, the working-water is cut off and cylinder G is again placed in communication with reservoir G'. Finally, by raising piston D by hand, the water above it is made to flow out. It will be seen that by proceeding in this way a minimum volume of water is consumed—indeed, only the amount corresponding to the period of crushing the rivet, since the space left empty by that part of the descent of the piston which is effected by hand is filled by water without pressure taken from reservoir G'.

We are aware of British Patents 3,056 of 1856 and 1,781 of 1868, and make no claim to anything therein shown.

No claim is made herein to anything shown or described in our former application hereinbefore referred to.

Having thus described our invention, what we claim is—

In a machine for riveting, shearing, punching, &c., the combination, with a cylinder G and a reservoir G', of a piston D, working in the cylinder and provided with a rack *a*, a pinion *b*, engaging said rack and adapted to actuate the piston to perform the prelimi-

nary cutting or riveting operation, a valve-chamber E, provided with passages *g g'*, communicating with the cylinder, and a passage *d'*, communicating with the reservoir, an inlet *d*, and a valve *e*, adapted to connect the passages *d'* and *g'* and *d* and *g* alternately, all substantially as shown.

In witness thereof we have signed this speci-

fication in the presence of two subscribing witnesses.

LÉON DELALOE.
ALBERT PIAT.

Witnesses:

I. DUPONT,
S. MAMERON.