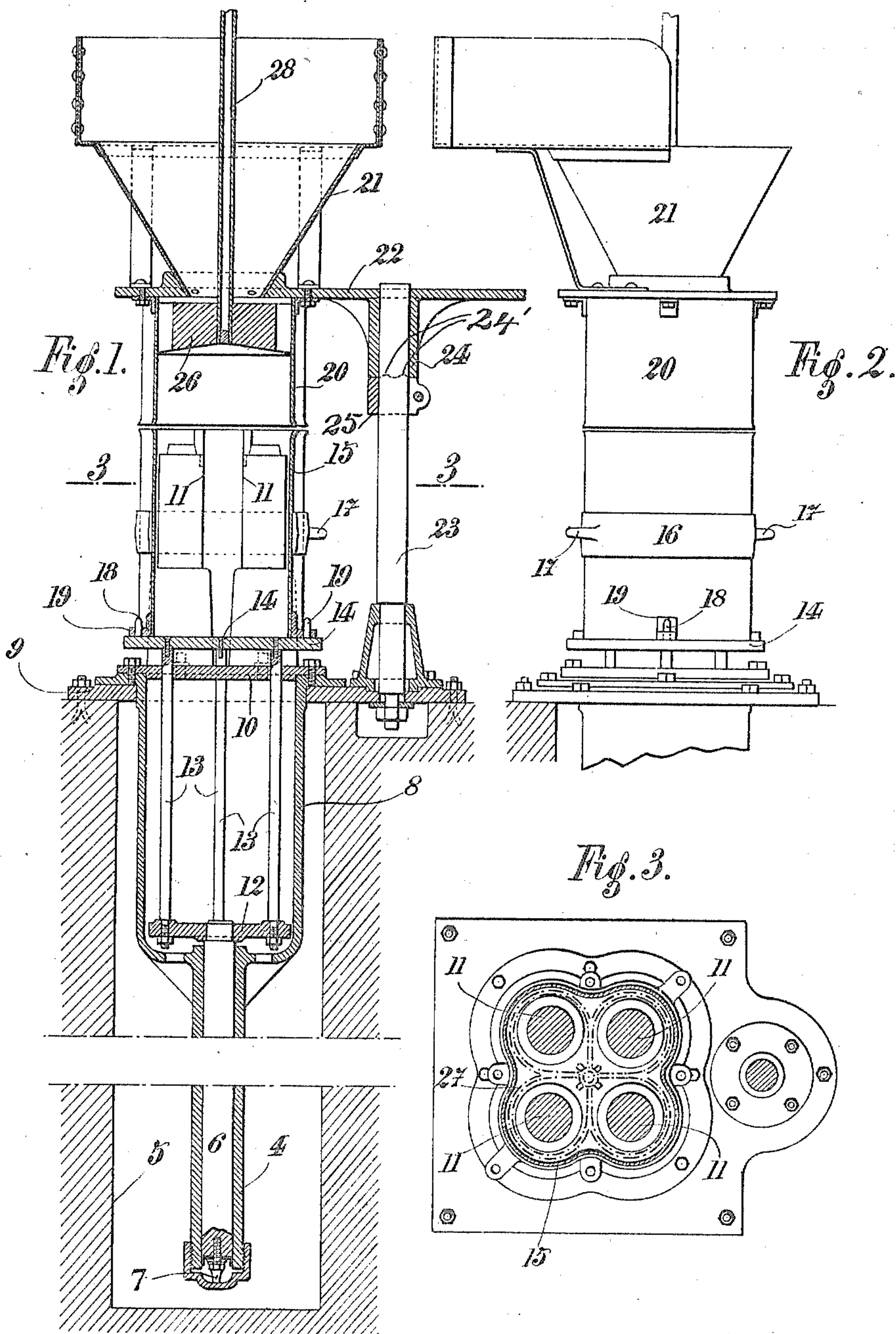


No. 812,004.

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P. BONVILLAIN.
MOLDING MACHINE.
APPLICATION FILED APR. 24, 1905.



Witnesses=
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UNITED STATES PATENT OFFICE.

PHILIBERT BONVILLAIN, OF PARIS, FRANCE.

MOLDING-MACHINE.

No. 812,004.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed April 24, 1905. Serial No. 257,056.

To all whom it may concern:

Be it known that I, PHILIBERT BONVILLAIN, a citizen of the Republic of France, residing at Paris, France, have invented new and useful Improvements in or Relating to Molding-Machines, of which the following is a specification.

This invention relates to a hydraulic machine for molding long parts even without any "taper"—such as, for instance, ordinary carriage axle-boxes, shells, &c., which it is difficult to mold by hand on account of their size. This machine is, moreover, intended to work very quickly with a minimum of hand labor.

A machine according to this invention is illustrated, by way of example, in the accompanying drawings, in which—

Figure 1 shows the whole machine in sectional elevation. Fig. 2 is a side elevation of the part of the machine which is above ground. Fig. 3 is a horizontal cross-section on line 3 3 of Fig. 1.

A hydraulic cylinder 4 is arranged at the bottom of a pit 5, and the piston 6 can rest on the bottom of the cylinder on a stop 7, which limits its downward stroke. The cylinder is cast together with a casing 8, also arranged in the pit 5 and provided with a flange which is secured to a foundation-plate 9, suitably secured to the ground. To the casing 8 is bolted a table 10, to which is secured a suitable number of patterns 11. For manufacturing ordinary carriage axle-boxes, which will be described here by way of example, four identical patterns 11 of axle-boxes are placed on the table 10. This number can, however, be increased or reduced without departing from the spirit of this invention, and these patterns may be replaced by patterns of such other parts as can be molded under the same conditions.

To the upper end of the piston 6 is secured a plate 12, to which are secured four rods 13, provided at the top with a stripping-plate 14, which surrounds the bottom portion of the four patterns, as shown in Fig. 1. On the stripping-plate 14 rests the frame 15, which incloses the patterns 11 at a suitable distance, as clearly shown in Fig. 3. As will be seen, the outer surface of the mold 15 is practically parallel to the outer surfaces of the four patterns, and there are concave or inwardly-curved joining portions of the frame or flask between two adjoining patterns, so as to require only the exact quantity of sand neces-

sary for molding and also in order that the whole mass of sand should be properly compressed, as will be described hereinafter. This frame or flask is surrounded by a hoop 16, of the same shape as the frame, provided with handles 17 for facilitating its handling. The frame 15 rests on the stripping-plate 14, provided outside with pins 18, intended to engage with lugs 19 of the frame in order to adjust the latter exactly in position.

Immediately above the frame 15 is arranged an additional part or superstructure 20 of the same shape, above which is arranged a hopper 21, surmounted by a box containing the sand required for several molding operations. The part 20 and the hopper 21 are secured to a disk 22, capable of freely revolving on a column 23, rigidly secured to the bed-plate 9, Fig. 1. This disk 22 is cast with a socket 24, which rests on a collar 25, tightened round the column for supporting the disk and adjusting its height. The upper face of the collar 25 and the bottom face of the socket 24 are corrugated, as shown at 24' in Fig. 1, (dotted,) so as to enable the disk 22 and the parts supported by it to be secured in certain positions.

In the interior of the part 20 a stamp or rammer 26 of a special shape is arranged so as to leave a certain amount of play. This stamp or rammer is constituted by four or more circular branches 26 of iron bar, bent as indicated by chain lines in Fig. 3 and rigidly connected to the end of a tubular handle 28. As will be seen on examining the drawing, the four circular branches of the rammer inclose the four patterns 11 and can move with sufficient play between these patterns and the frame 15 surrounding them. Moreover, the bottom face of the rammer is conical and has the shape similar to that of stuffing-boxes, as shown in Fig. 1.

In order to effect a molding operation, the disk 22 is turned on the column 23, so as to bring the part 20 exactly above the frame 15, and the disk 22 is secured in that position by the coincidence of the corrugations of its socket 24 with those of the collar 25. Sand from the upper box is then caused to fall gradually through the hopper 21 into the frame 15, and this sand is compressed as it falls by means of the rammer 26 until the patterns 11 are covered with sand and the latter is flush with the upper edge of the frame 15. It will be seen that, owing to its shape, the rammer compresses the sand

round the patterns as well as in the interior and outside, so that not a portion of the surface of the sand escapes its action. When this operation has been completed, the table 5 22 is turned on the column 24, so as to move the part 20 away from the frame 15, and this casing is made to make quarter of a revolution or more, if necessary. Water under pressure is then admitted into the bottom 10 portion of the cylinder 4. The piston rises with the disk 12, the rods 13, the stripping-plate 14, and the frame 15, while the patterns remain on the table 10. The taking out of the mold is therefore effected by the ascent 15 of the piston 6, and the stripping-plate 4 continually maintains the sand at its bottom part, so that not a particle of it can be broken off. When the piston has risen to a sufficient extent to disengage the mold 15 from 20 the patterns 11, the said mold is removed by the handles 17, and it only remains to place the cores into the mold in order to make the casting in the usual way. For the next operation the piston 6 is lowered down and a 25 new flask 15 placed on the stripping-plate 14. With this machine the taking out of mold is very easily and quickly effected, the pattern is not shaken, and no skill on the part of the attendant is required.

30 Having now particularly described and ascertained the nature of my said invention

and in what manner the same is to be performed, I declare that what I claim is—

In a molding-machine, the combination with a fixed table adapted to hold one or 35 more similar patterns, a stripping-plate for surrounding said patterns, vertical rods fixed to the stripping-plate and passing through the fixed table, a plate connecting the lower 40 extremities of said vertical rods, a piston having its upper extremity fixed to said plate, a cylinder in which the piston moves, said cylinder being rigidly connected with the fixed table, a frame for surrounding the patterns 45 and resting upon the stripping-plate, a vertical column fixed at the side of the machine, a rotatable support upon the column, a second frame of the same form as the one which surrounds the patterns, the same being fixed to 50 the said support, a hopper surmounting the second frame, and a rammer conforming to the interior form of said frames and fitted to surround the patterns, substantially as described and for the object specified.

In testimony whereof I have affixed my 55 signature in presence of two subscribing witnesses.

PHILIBERT BONVILLAIN.

Witnesses:

HENRI VIGNOME,
ARMAND ROBIN.