

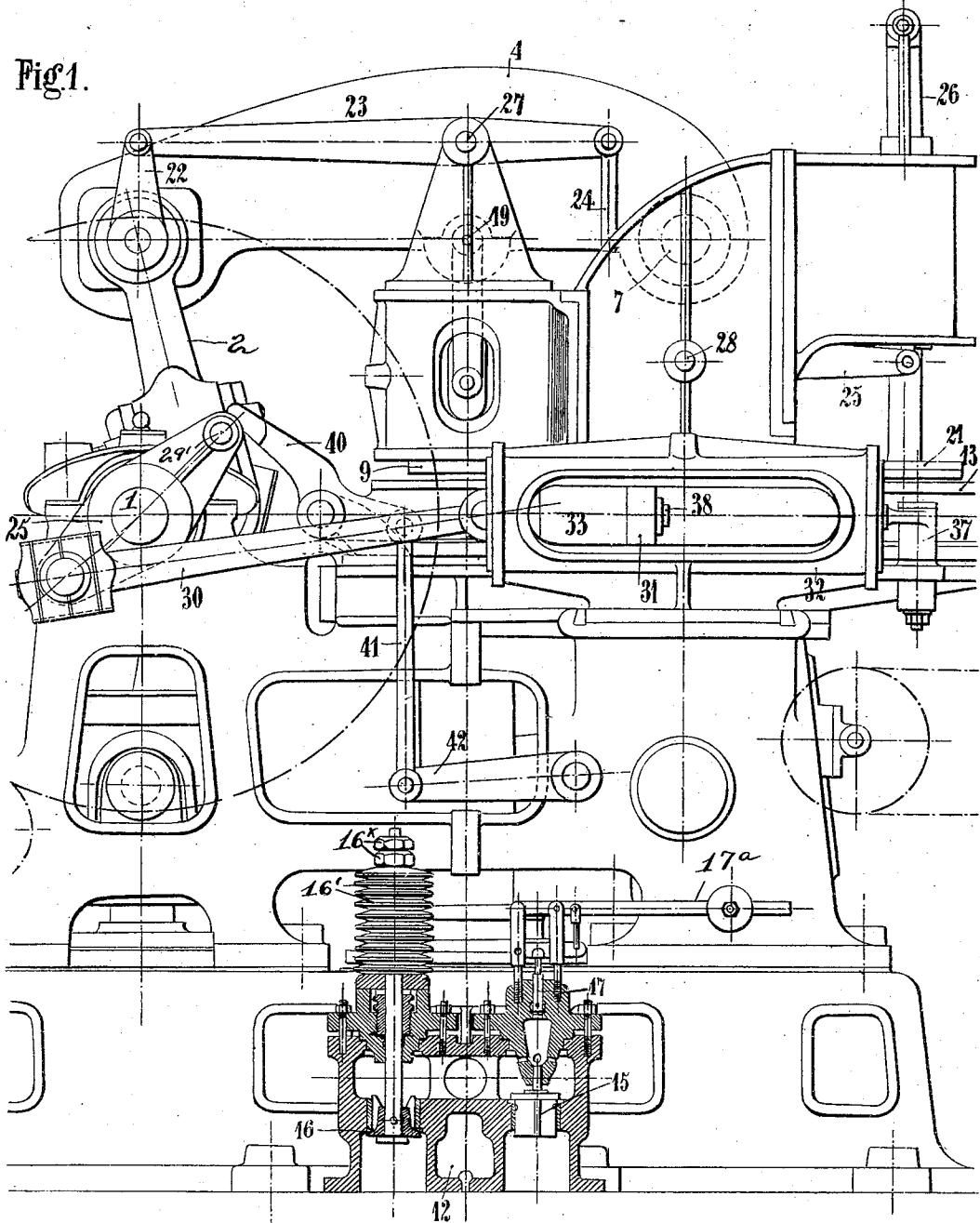
O. CROCHET.
 AGGLOMERATING MACHINE.
 APPLICATION FILED MAY 4, 1907.

938,217.

Patented Oct. 26, 1909.

6 SHEETS—SHEET 1.

Fig 1.



WITNESSES

W. P. Burke
 A. J. Heuman

INVENTOR

Octave Crochet

BY

Am. M. Co.
 ATTORNEYS

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6 SHEETS—SHEET 2.

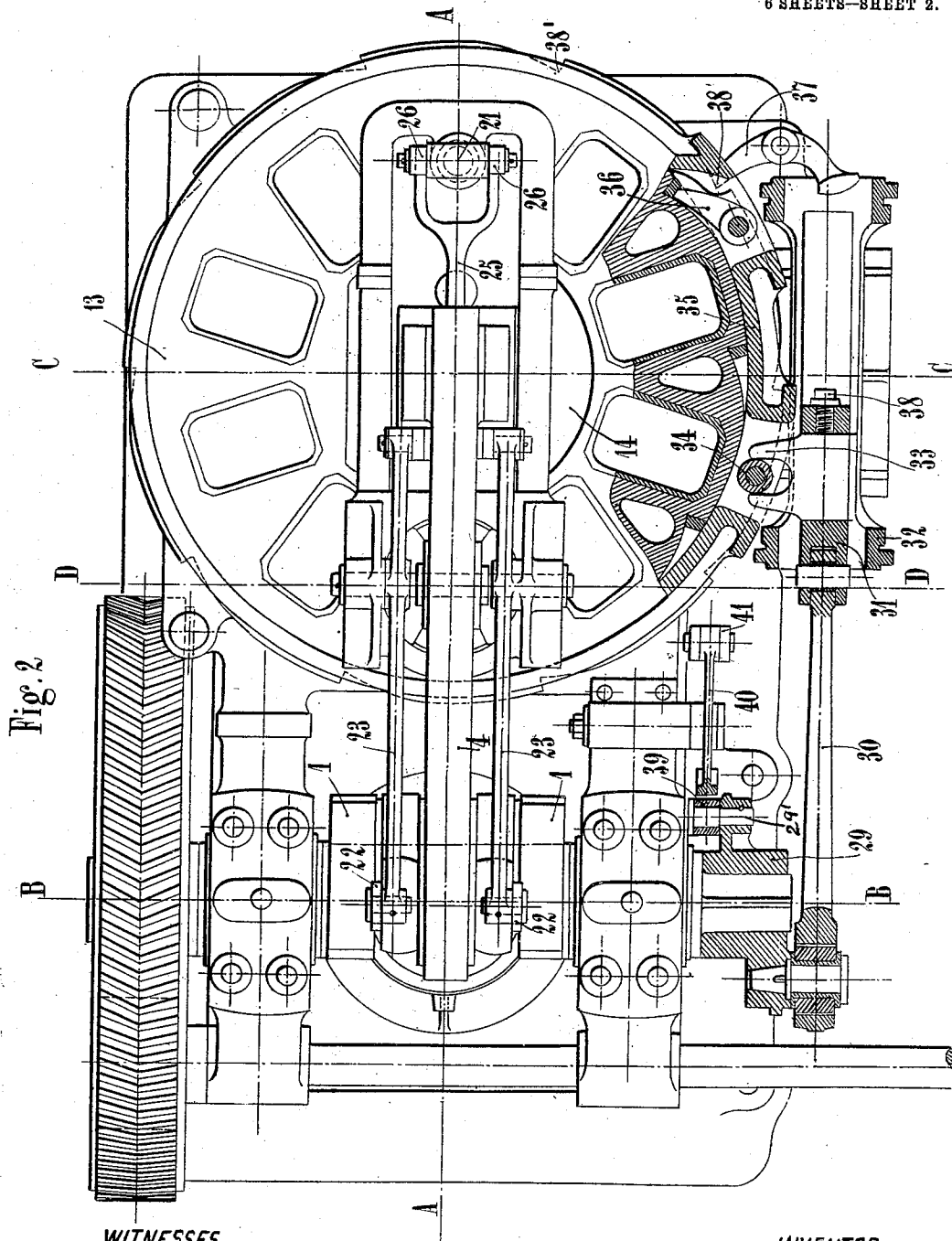


Fig. 2

WITNESSES

W. P. Burke

H. J. Heuman

INVENTOR

Octave Crochet

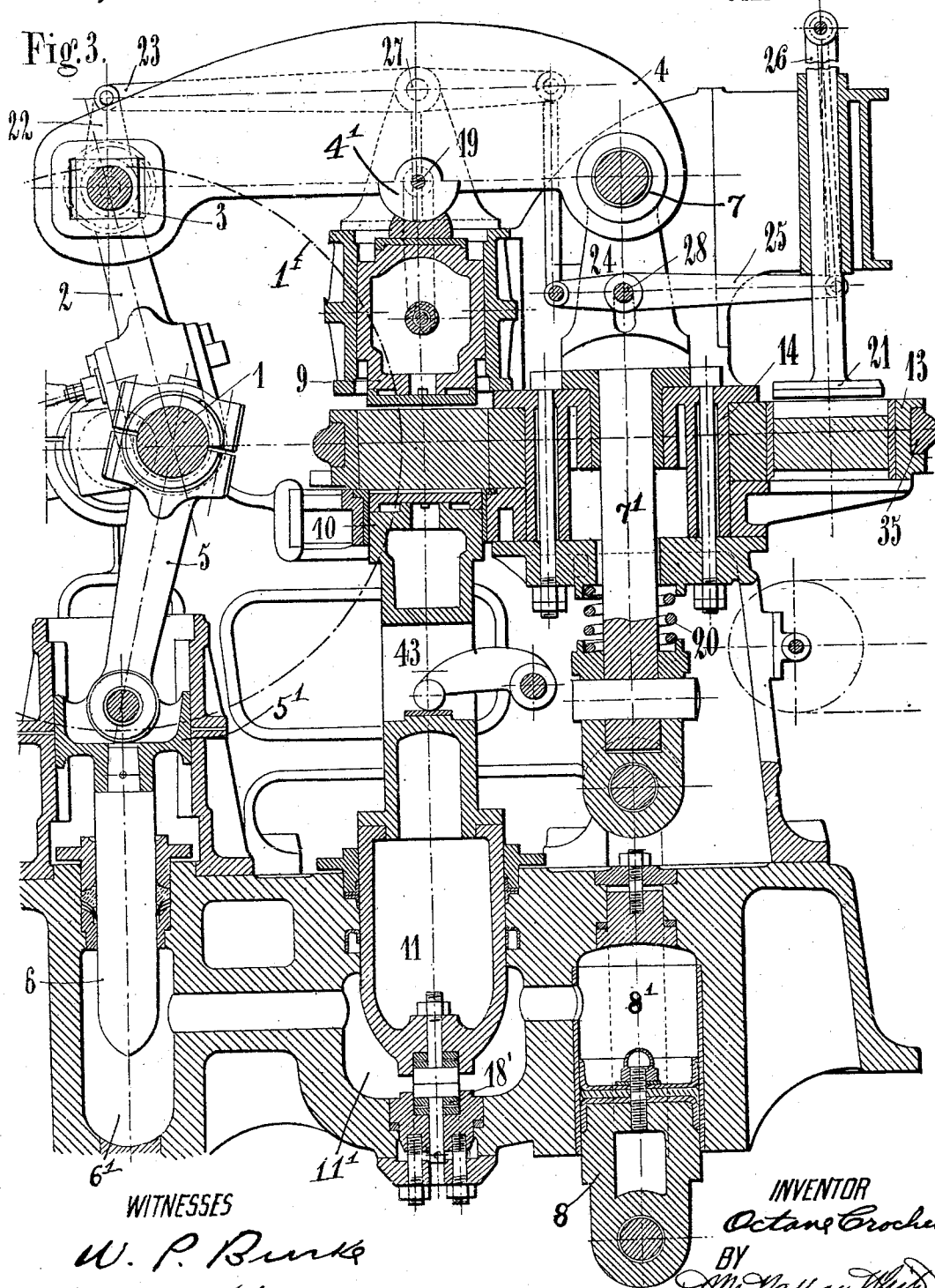
BY

Attorneys

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6 SHEETS—SHEET 3.

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WITNESSES

W. P. Burke
A. F. Heuman.

INVENTOR

O. Crochet

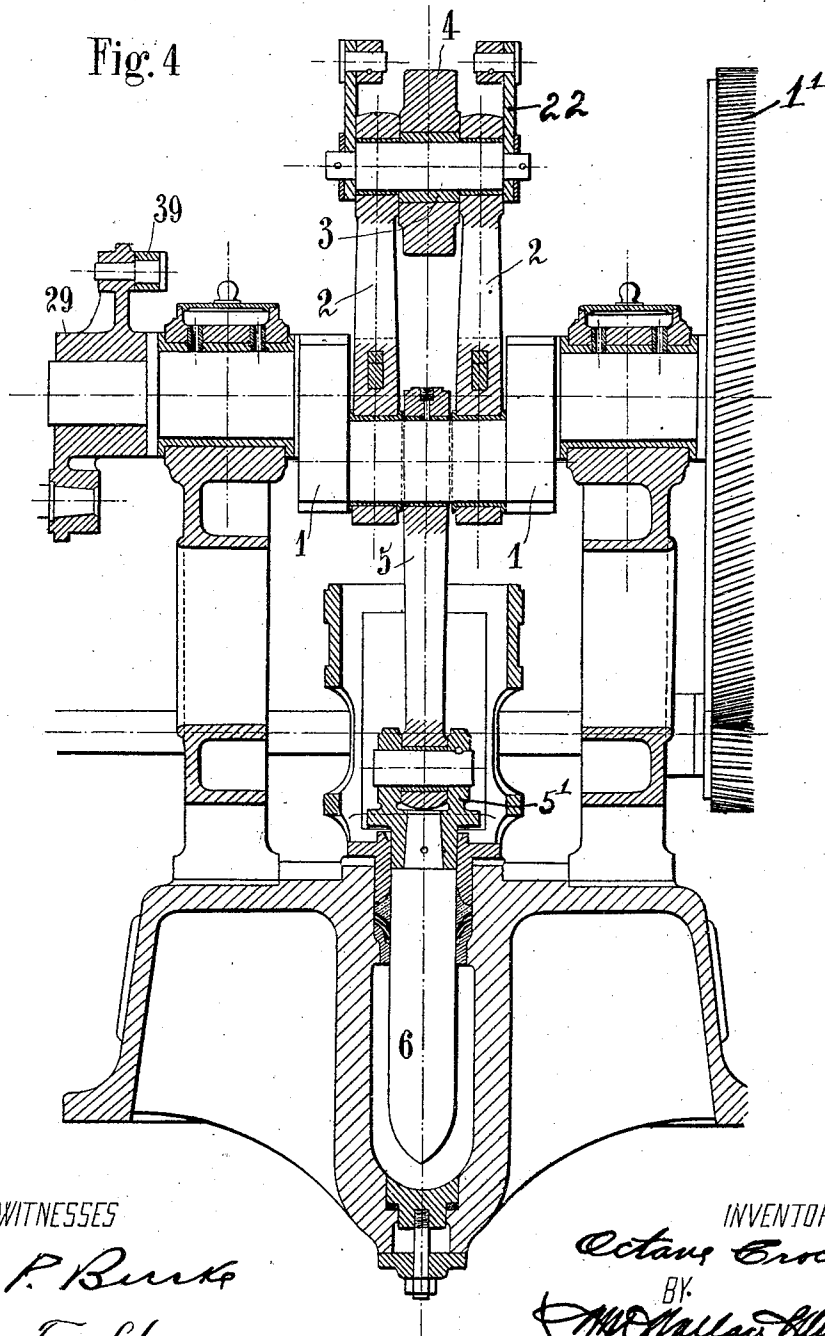
BY

M. Mallon & Co.
ATTORNEYS

O. CROCHET.
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6 SHEETS—SHEET 4.



WITNESSES
W. P. Burke
A. F. Skuman.

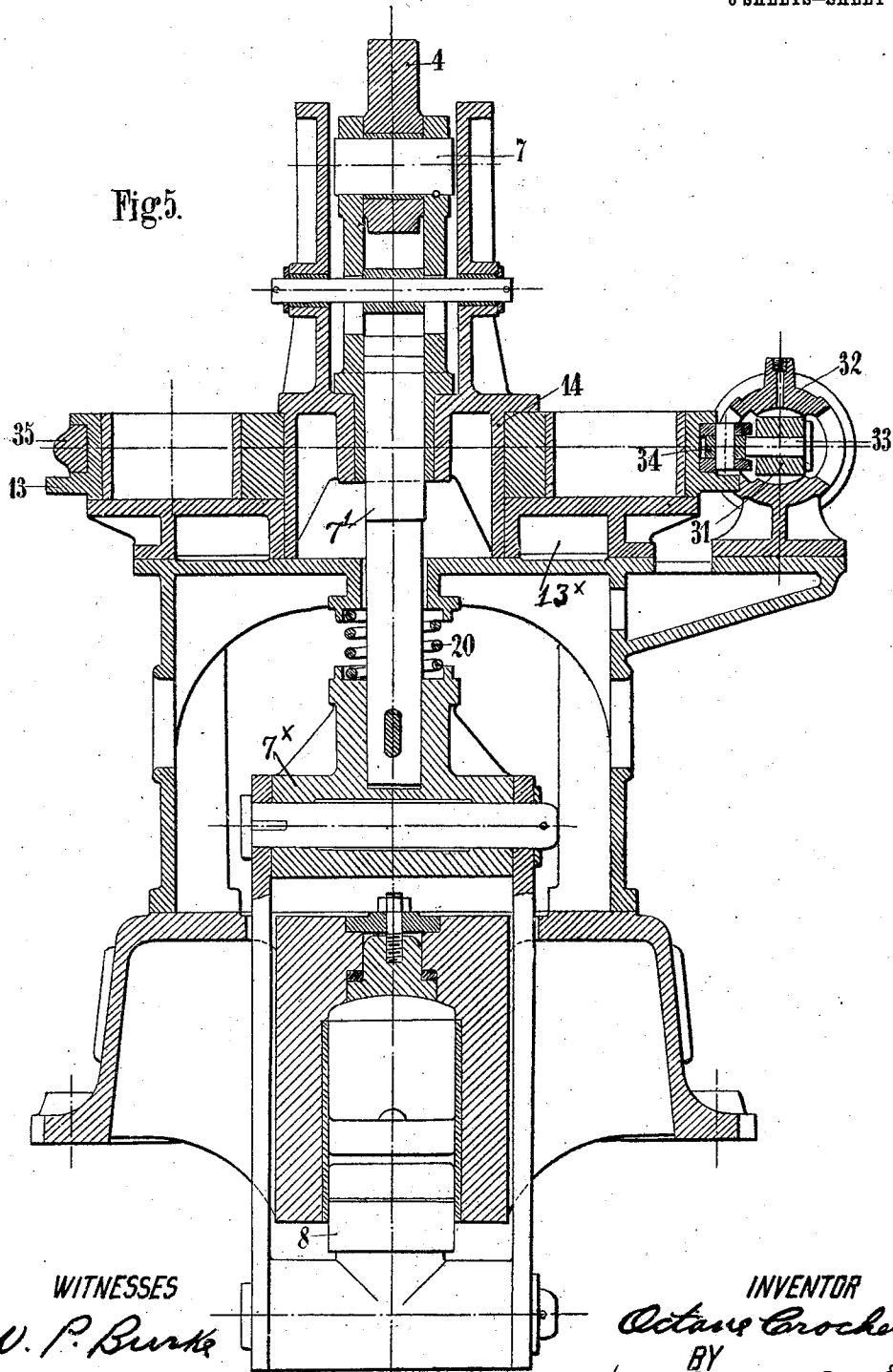
INVENTOR
Octave Crochet
BY
M. J. Mallon
ATTORNEYS

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 6 SHEETS—SHEET 5.

Fig. 5.



WITNESSES

W. P. Burke

A. F. Heuman

INVENTOR

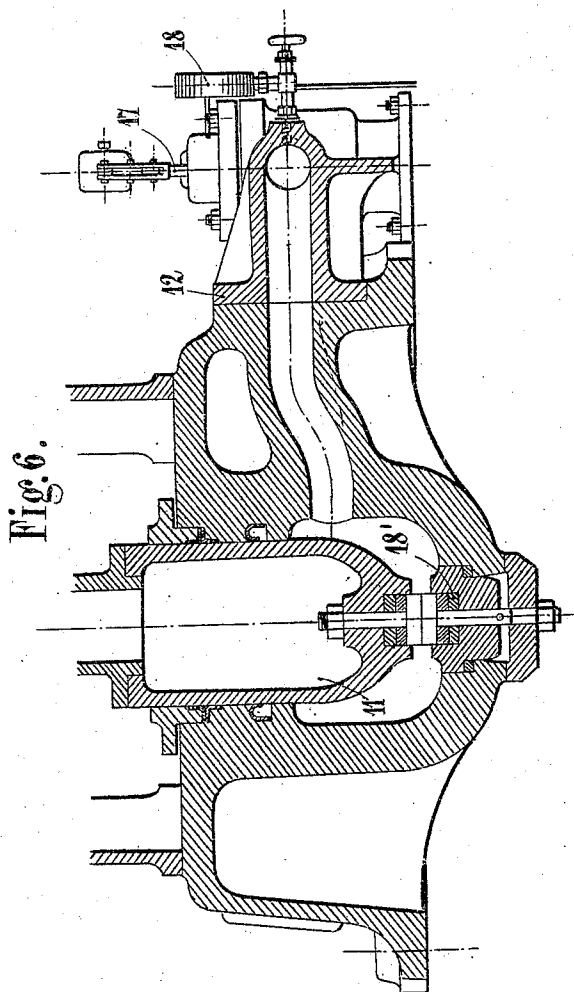
Octave Crochet

BY

AM. M. & H. H. H. H.
 ATTORNEYS

938,217.

Patented Oct. 26, 1909.
6 SHEETS—SHEET 6.



WITNESSES
W. P. Burke
A. F. Human.

INVENTOR
Octave Crochet
BY
Wm. McLean Blair
ATTORNEYS

UNITED STATES PATENT OFFICE.

OCTAVE CROCHET, OF ALAIS, FRANCE, ASSIGNOR TO LA SOCIÉTÉ DE CONSTRUCTIONS MECANIKES D'ALAIS, OF ALAIS, FRANCE.

AGGLOMERATING-MACHINE.

938,217.

Specification of Letters Patent.

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Application filed May 4, 1907. Serial No. 371,947.

To all whom it may concern:

Be it known that I, OCTAVE CROCHET, a citizen of the Republic of France, and resident of Alais, France, have invented a new and useful Improvement in Agglomerating-Machines, which improvement is fully set forth in the following specification.

This invention relates to a press with two rams and an intermittingly revolving molding table with molds open on both sides, in which one of the rams is driven directly by means of a hydraulic piston which is under hydraulic pressure capable of regulation, and the other by the hydraulic press through the medium of a lever system, and both rams exert a simultaneous double pressure on the material to be pressed which is contained in the molds.

In the invention a double transmission of the regulatable pressure of the press cylinders is striven for. To this end the lever driving the upper ram is so connected by means of crank drivers with a compression piston which the fluid in the press cylinder places under regulatable pressure, that the respective lever arm makes a stroke corresponding to the stroke of the compression piston and therefore always even. On the other hand a special hydraulic piston likewise exposed to the regulatable pressure of the press cylinder operates on the other arm of this lever.

Figure 1 shows a side view of the briquet press. Fig. 2 is a plan view. Fig. 3 is a section on the line A—A of Fig. 2. Fig. 4 is a cross section on line B—B of Fig. 2. Fig. 5 is a cross section on the line C—C of Fig. 2. Fig. 6 is a cross section through the connection between the press pot and the valve box.

In the lower part of the frame are three cylinders 6', 11', 8', connected with each other. In the cylinder 6' operates a compression piston 6 driven by a cranked shaft 1; in cylinder 11' operates the hydraulic piston 11 bearing the press ram 10, and in the cylinder 8' operates the hydraulic piston 8 connected with one end of the lever 4.

At one end of the cranked shaft 1 is a toothed wheel 1' in which engages a second toothed wheel driven by a motor. To the crank of shaft 1 are attached two driving rods 2 extending upwardly and to which are attached a bar 3 borne by one end of the lever 4. To the crank is also attached a driv-

ing rod 5 extending downwardly and to which is linked a sliding shoe 5' which bears underneath the hydraulic compression piston 6. The other end 7 (Fig. 1) of the lever 4 is connected by means of a rod 7' and yoke 7* to the hydraulic piston 8 (Figs. 3 and 5). Secured to the under side of the central part of lever 4 is a semi-cylindrical pressure piece 4' which operates upon the upper press ram 9, (Fig. 3.) The lower press ram 10 is connected at its lower end with the hydraulic piston 11 which rests upon an elastic cushion 18'.

A valve box 12 is in communication with the three cylinders 6', 8' and 11' and this box contains an inlet valve 15 and an outlet valve 16, the inlet valve controlling the flow of water to the box and cylinders from a suitable supply. A plate 13, capable of being revolved on a table 13* around a cylindrical frame piece 14, (Fig. 5) bears a certain number of mold openings (Figs. 2 and 3) lying in a circle, of a size corresponding to the cross section of the press rams. This plate 13 intermittingly rotated by means hereinafter-described comes to rest in a position in which one briquet can be pressed in one opening and a finished briquet out of another and the press rams withdrawn in order to allow the plate to again be given a partial revolution.

The molding of the briquets is accomplished in such a way that the cranked shaft 1 when its crank goes upward and the press ram 9 moves up raises the hydraulic compression piston 6, whereby the suction or inlet valve 15 is raised so as to fill the press cylinders. At the beginning of the downward stroke of the crank shaft the suction valve 15 is closed, and this movement being maintained, the upper press ram 9 is moved downward, and under the action of the hydraulic compression piston 6 the lower press ram 10 is moved upward, and under pressure of both rams 9 and 10 the material contained in the mold is pressed.

For each kind of material the pressure must have for the measuring unit of surface, a measured strength. The pressure or outlet valve 16 (Fig. 1) opens downwardly and compresses by means of its rod a plate spring 16' which presses against the valve box 12 and said spring can be adjusted by a nut and a check nut 16*, according to the measure of the pressure which is to be at-

tained on both sides of the briquet. A safety valve 17 (Figs. 1 and 6) with weighted rod 17^a and a manometer 18 (Figs. 1 and 6) serve for the supervision of this regulation. The measurement of the longer arm of the lever 4 and the diameter of the compression cylinder 6 are so proportioned that the lift of the lower press ram 10 amounts to only two-thirds of that of the upper press ram 9.

If the pressure for the measuring unit of surface exceeds the determined measure, the valve 16 allows water to flow from the box 12 until equilibrium in the press cylinders is produced; the upper press ram 9 presses the briquet downward and under this influence the hydraulic piston 11 bearing the lower press ram 10 presses against its elastic cushion 18' (Fig. 3). Upon further pressure the lever 4 rocks on the pin 19 and raises the piston 8 so that the pistons 9 and 10 are not moved. In the upward movement of the crank the lever 4 is returned to normal position by the spring 20 which has been compressed and by the water flowing into the box 12 and acting on piston 8. There cannot therefore be produced an excessive pressure leading to the injury of the parts of the machine. The piston 21 effects the ejection of the briquet from the mold. This is moved by a link 22 (Fig. 1) attached to one end to the lever 4 and with its other end attached to a lever 23 capable of turning on 27. This operates by means of the rod 24 on a lever 25 capable of turning on 28 (Fig. 3) which by means of the rod 26 is connected to the upper end of the rod of the piston 21. The movement of the ejecting piston 21 is therefore independent of the hydraulic regulation. Therefore a briquet is with certainty ejected each time from the mold.

The intermittent revolution of the molding-table plate 13 is transmitted by the shaft 1. One end of the latter bears a crank 29 (Fig. 2) which by means of a driving rod 30 moves a sliding piece 31, which slides in a guide. A fork 33 of the sliding piece embraces constantly a pin 34, the end of which is fixed on a two-parted collar 35, which is revolved back and forth in a circular groove of the molding table plate 13 by means of the crank and driving rod.

In the groove of the molding table plate there are a number of teeth corresponding to the number of molds on which the pawl 36 which is fastened to the ring 35 operates. By this means a partial revolution of the molding table plate is produced at each revolution of the shaft 1. On the front part of the sliding piece there is an adjusting screw 38, which at the end of the revolution of the molding table 13 strikes the arm of a trigger pin 37 and this presses into a depression 38' of the plate. The latter is

then stopped exactly at the moment in which the briquet to be pressed finds itself opposite the two press rams 9 and 10.

It sometimes occurs that on account of too strong friction of the lower press ram 10, that this does not fully withdraw from the molding table 13 and thus hinders the movement of the table. In order to avoid this a roll 39 (Fig. 2) set on an opposite arm of the crank 29 acts on the arm of a lever 40 (Fig. 1), the other arm of which is connected by means of a rod 41 with the arm 42 whose axle carries a pressure lever 43. This, under the action of the roll 39, presses upon the bottom of a notch in the rod connecting the hydraulic piston 11 with the press ram 10 and withdraws the latter from the opening of the molding table 13.

I claim as my invention:—

1. An agglomerating machine comprising a mold carrying element, upper and lower molding pistons, a crank shaft, a hydraulic press pot, a piston 6 operating in said pot and connected to the crank shaft, a piston 11 also operating in the said pot and connected directly to the lower molding piston; a piston 8 also operating in said press pot, an upper lever 4 having one end connected with said piston 8 and its other end connected with the crank shaft and bearing at an intermediate point on the upper molding piston; and means for rotating the crank shaft.

2. An agglomerating machine comprising a hydraulic press pot, an inlet valve thereto, an adjustable outlet valve therefrom, a crank shaft, a piston 6 connected to said crank shaft and operating in the press pot, a piston 11 operating in said press pot, and a lower molding piston carried by said piston 11, a piston 8 operating in the press pot, an upper lever 4, means for connecting one end of said lever with the piston 8 and the other end with the crank shaft, an upper molding piston operated by the lever 4, and means for rotating the crank shaft.

3. An agglomerating machine comprising a hydraulic press pot, an inlet valve thereto, an adjustable outlet valve therefrom; a crank shaft, a piston 6 connected to said crank shaft and operating the press pot, a piston 11 operating in said press pot, and a lower molding piston carried by said piston 11, a piston 8 operating in the press pot, an upper lever 4, means for connecting one end of said lever with the piston 8 and the other end with the crank shaft, an upper molding piston operated by the lever 4, means for rotating the crank shaft, and a yielding support for the piston 11.

4. An agglomerating machine, comprising a crank shaft, means for operating the same, a hydraulic press pot, a piston 6 operating therein and connected with the crank shaft, a piston 11 operating in said press

pot, a lower molding piston connected with said piston 11, an upper molding piston, a mold carrying element, a lever 4 having one end connected with the crank shaft and
5 adapted to operate the upper molding piston, a piston 8 operating in the press pot, rods connecting said piston 8 with the other end of the lever 4, and a coiled spring 20 adapted to be compressed by the upward
10 movement of the rods connecting said lever 4 with the piston 8.

5. An agglomerating machine comprising upper and lower molding pistons, a crank shaft, an upper lever pivoted at one
15 end, links connecting its other end to the crank, said lever being connected at an intermediate point to the upper molding piston, a hydraulic press, a piston therein connected with the lower molding piston, a second pis-

ton in the hydraulic press connected to the 20 crank shaft, a mold carrying element, means for operating said element from the crank shaft, a discharging device of constant stroke, a lever 23 pivoted at an intermediate
25 point above the point of connection between the upper lever and the upper molding piston, a series of links connecting one end of said lever 23 with the discharging device, and a link 22 connecting the other end of said
30 lever 23 with the link connecting the crank shaft with the upper lever.

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

OCTAVE CROCHET.

Witnesses:

PIERRE CORROID,
FRANÇOIS GRÀVELY.