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 APPARATUS FOR MANUFACTURING LEAD TRAPS BY HYDRAULIC PRESSURE.  
 APPLICATION FILED AUG. 4, 1906.

907,077. Patented Dec. 15, 1908

Fig. 1

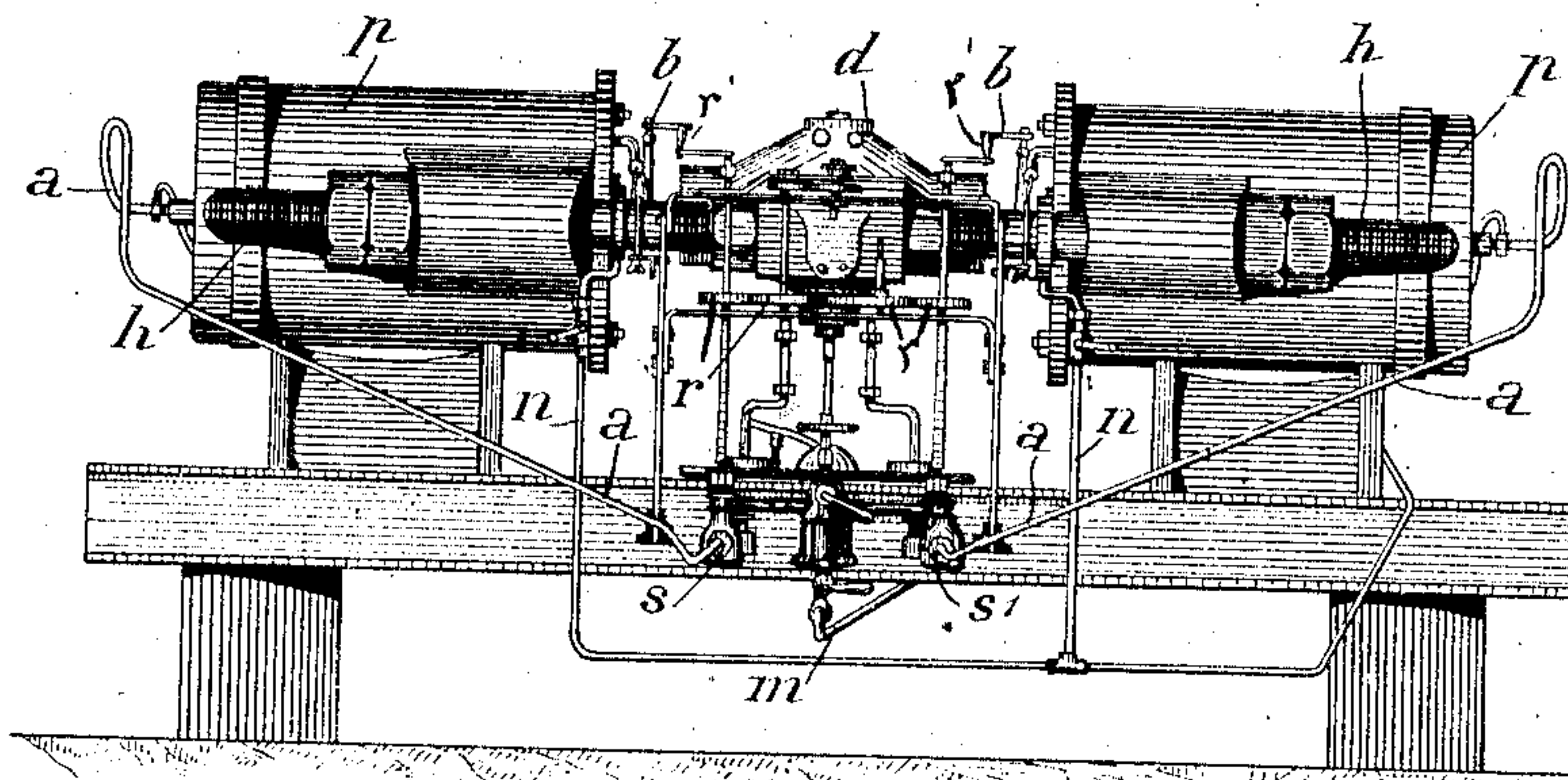


Fig. 2

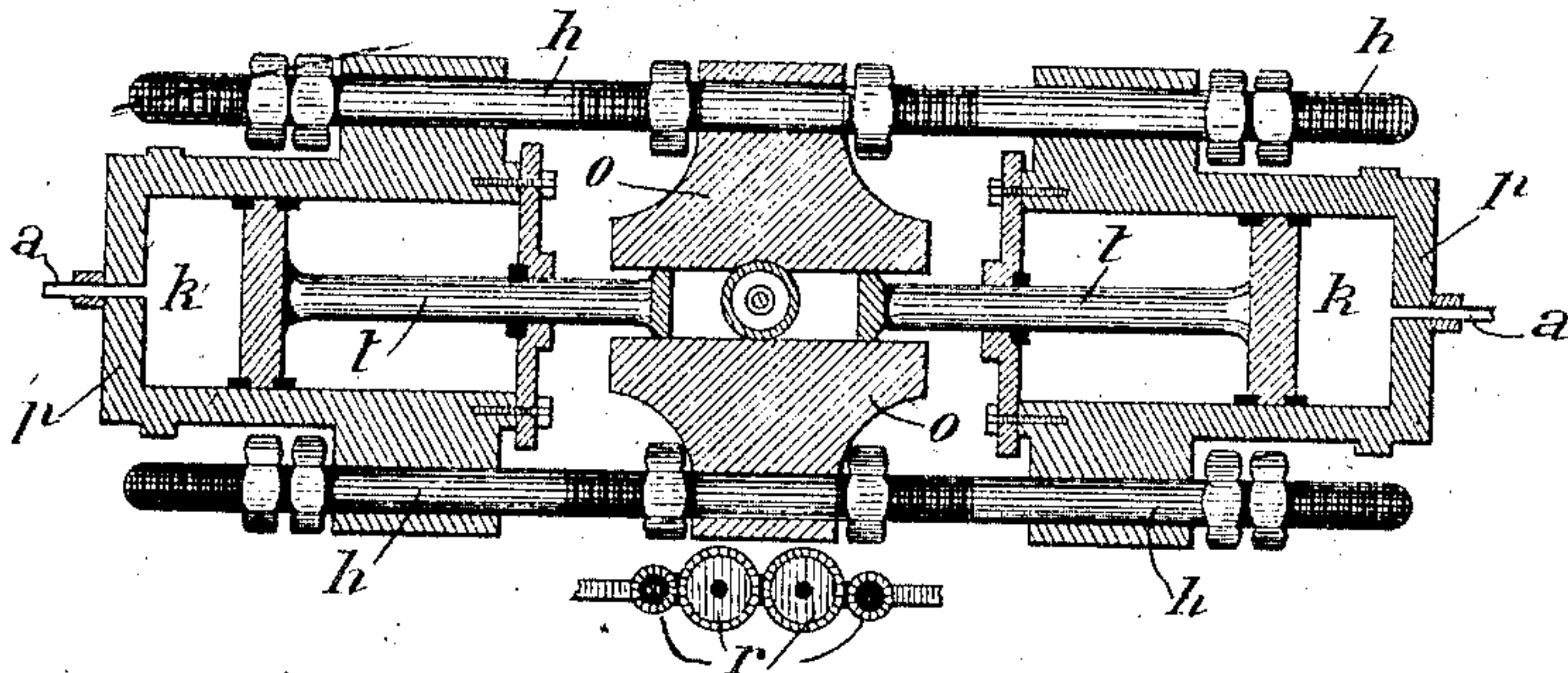


Fig. 3

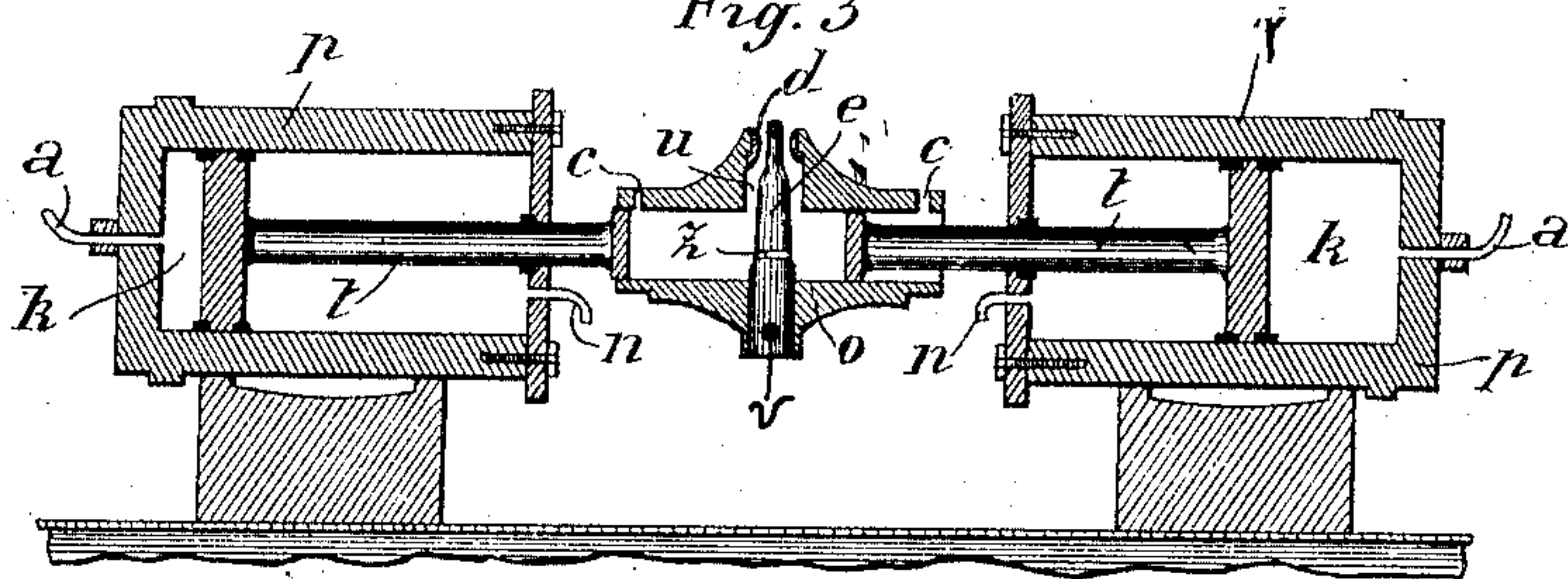
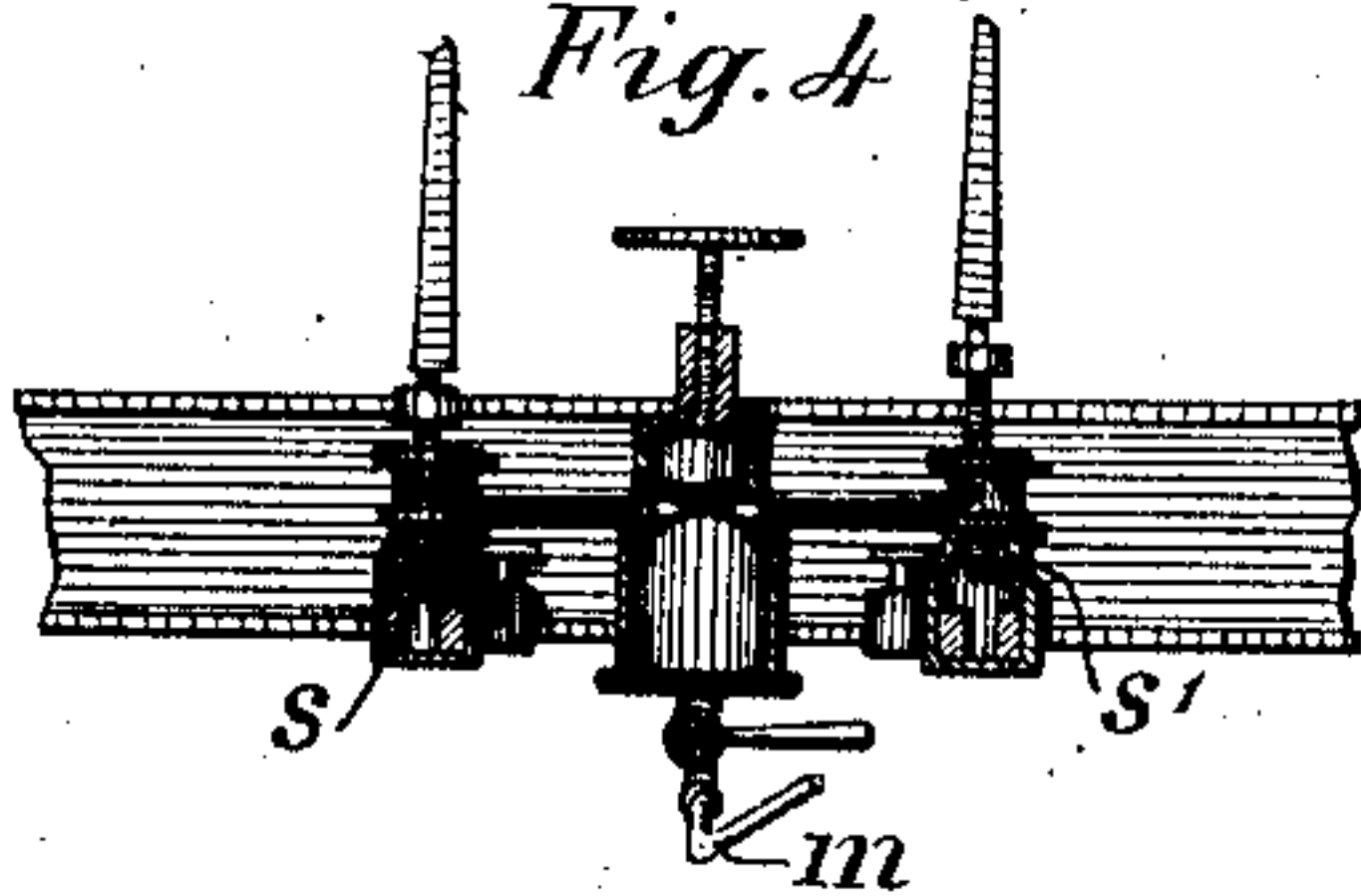


Fig. 4



Witnesses:  
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 Att.



# UNITED STATES PATENT OFFICE.

GIUSEPPE MERETA, OF GENOA, ITALY, ASSIGNOR TO "LA PIOMBIFERA", SOCIETÀ ANONIMA ITALIANA PER L'INDUSTRIA DEL PIOMBO E GENERI AFFINI, OF GENOA, ITALY, A COMPANY.

## APPARATUS FOR MANUFACTURING LEAD TRAPS BY HYDRAULIC PRESSURE.

No. 907,077.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed August 4, 1906. Serial No. 329,219.

*To all whom it may concern:*

Be it known that I, GIUSEPPE MERETA, subject of the King of Italy, residing at Genoa, Italy, have invented new and useful  
5 Improvements in or Relating to Apparatus for Manufacturing Lead Traps by Hydraulic Pressure, of which the following is a specification.

This invention relates to an apparatus for  
10 the manufacture of lead traps (siphons) by hydraulic pressure which apparatus is chiefly constituted by

1. Two cylinders having each a pressure operated piston.
- 15 2. A lead chamber.
3. A special valve gear for distributing the pressure on the lead.

A simple form of construction of the apparatus is shown, by way of example, in the accompanying drawing.

In the said drawing, Figure 1 is a general view of the complete apparatus, Fig. 2 a sectional plan, Fig. 3 a vertical section, and Fig. 4 a detail view of the special valve gear for  
25 the liquid under pressure.

As will be seen on examining the drawings, the lead chamber is constituted by a chamber proper, inner core or die —*e*— and a removable ring —*d*— for regulating the thickness of the trap.

The object of the use of the ring —*d*— is (a) to facilitate the making of very narrow curves and (b) to facilitate the separation of the residue of lead when it is desired to remove the core —*e*—. The inner core —*e*— is tapered and is arranged in the lead chamber where it is held in place by a slightly conical key —*v*—. The said core is provided with two grooves —*u*— through which on  
40 being forced by the pistons —*t*—, the lead rises to the orifice of the lead chamber —*d*—. Opposite the centers of the pistons —*t*—, a hole —*z*— is provided in the core *e* for the purpose of being used as a supply and compensation hole.

The lead chamber is provided with two holes —*c*— (Fig. 3) for introducing the lead.

The valve gear shown in detail in Fig. 4, serves to facilitate the regulation or change of  
50 pressure in the cylinders —*p*—. It is constituted by two valves —*s*—*s'*— the spindles of which are connected together by means of a system of toothed wheels —*r*— and operated by means of cranks —*r'*—. The use of

toothed wheels offers the very great advantage of enabling the opening and closing of the said valves to be regulated from a maximum to a minimum.

The driving power required for working this machine is about 2 HP for 180 atmospheres with lead at a temperature of 150°.

The operation is as follows. As soon as the lead chamber has been properly heated lead is introduced through the holes *c*, and as soon as the lead has solidified, the manufacture begins. If the valves —*s*—*s'*— are left uniformly open, the result will be that a straight pipe will come out from the orifice of the lead chamber for both pistons will uniformly advance toward the core *e*. But if  
70 one of the valves, for instance —*s'*—, is closed, the pipe will be bent towards the side of the closed valve as only the piston *t* will then advance.

The supply and the compensation take place in the following manner. If the right hand piston —*t*— is cut off and consequently standing still, while the left hand piston continues to work, a small portion of the lead, instead of escaping through the groove —*u*— on the left hand side of the core, will pass through the hole —*z*—, and as it will meet the fixed right hand piston, it will supply the inner curve of the trap curvature through the groove —*u*— on the right hand side of  
85 the core. As it is impossible to maintain the lead chamber —*o*— at a constant temperature up to one-tenth of a degree, and the lead could be more or less liquid according to the degree of heat, it follows that, in order to obtain curves or bends not only always equal, but also more or less wide, the two cylinders must be provided each with a discharge valve —*b*— the working of which is as follows:—If the right hand piston is cut  
95 off, that is to say, standing still, and the left hand one exercises a pressure, if the supply hole *z* admits an excessive quantity of lead, so that the inner curve becomes too wide, and if the discharge valve of the cylinder is opened to a greater or less extent, it will follow that, under the effort of the left hand piston, the lead supplied through the hole *z*, instead of rising through the right hand groove of the core *e*, will force the right hand  
105 piston back, so that the supply through the right hand groove failing, the curve will become narrower. The same thing will hap-



pen when the left hand piston is standing still, and the right hand one working. The working of the valve gear for regulating the hydraulic pressure on the pistons *t* is very simple. Water under pressure, supplied by a pump or other suitable means, is carried to the valves *s*, *s'* by the pipe —*m*— (Fig. 4) under a pressure varying between 150 and 200 atmospheres. If the two valves —*s*— *s'*— are equally wide opened, water under pressure passes in equal parts into the chambers —*k*— of the two cylinders —*p*—, both pistons *t* uniformly advance, and the lead will rise straight in the shape of a pipe. But if one valve, for instance —*s'*—, is closed, the other valve, owing to the gear connection will be opened to a greater extent, and consequently the whole pressure will be admitted into one cylinder only, the advance of one piston alone toward the core *e* thus forcing the lead pipe to bend towards the other piston. By opening the closed valve, and by closing the one that was open, the lead pipe will be forced to bend in the other direction. By opening the valves to an equal extent, the curvature will stop at once, and the pipe will rise straight again.

In order to prevent the pistons from continuing to advance under the influence of the expansion of the air which is always contained in water, instead of stopping at once after the closing of the respective valve, the cylinder is drained by means of a valve —*b*— which can be connected directly to the pressure pipe *a* connecting the cylinder with its valve.

Low pressure is supplied by a pump and

admitted by a pipe —*n*— to the front portion of each cylinder in order to enable the pistons *t* to return so as to leave disengaged the hole —*c*— through which lead is introduced into the chamber —*o*—.

The filling of the lead chamber, which can be done in about 10 minutes, can be effected through the holes —*c*— or the orifice of the lead chamber through which the lead is forced out.

Having now fully described my said invention and the manner in which the same is to be performed, what I claim and desire to secure by Letters Patent of the United States is:—

In an apparatus for manufacturing lead traps, the combination with a lead chamber and a core therein, of two hydraulic cylinders arranged on opposite sides of said lead chamber, a plunger projecting from each of said hydraulic cylinders and adapted to enter said lead chamber on opposite sides thereof, means to regulate the hydraulic pressure applied to said plungers, said means comprising two valves, gearing operatively connecting said valves, a crank connected with each of said valves to operate said gearing so as to close one valve while opening the other valve and two discharge valves (*b*) and cranks for operating the same.

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

GIUSEPPE MERETA.

Witnesses:

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CARL FRYMANN.