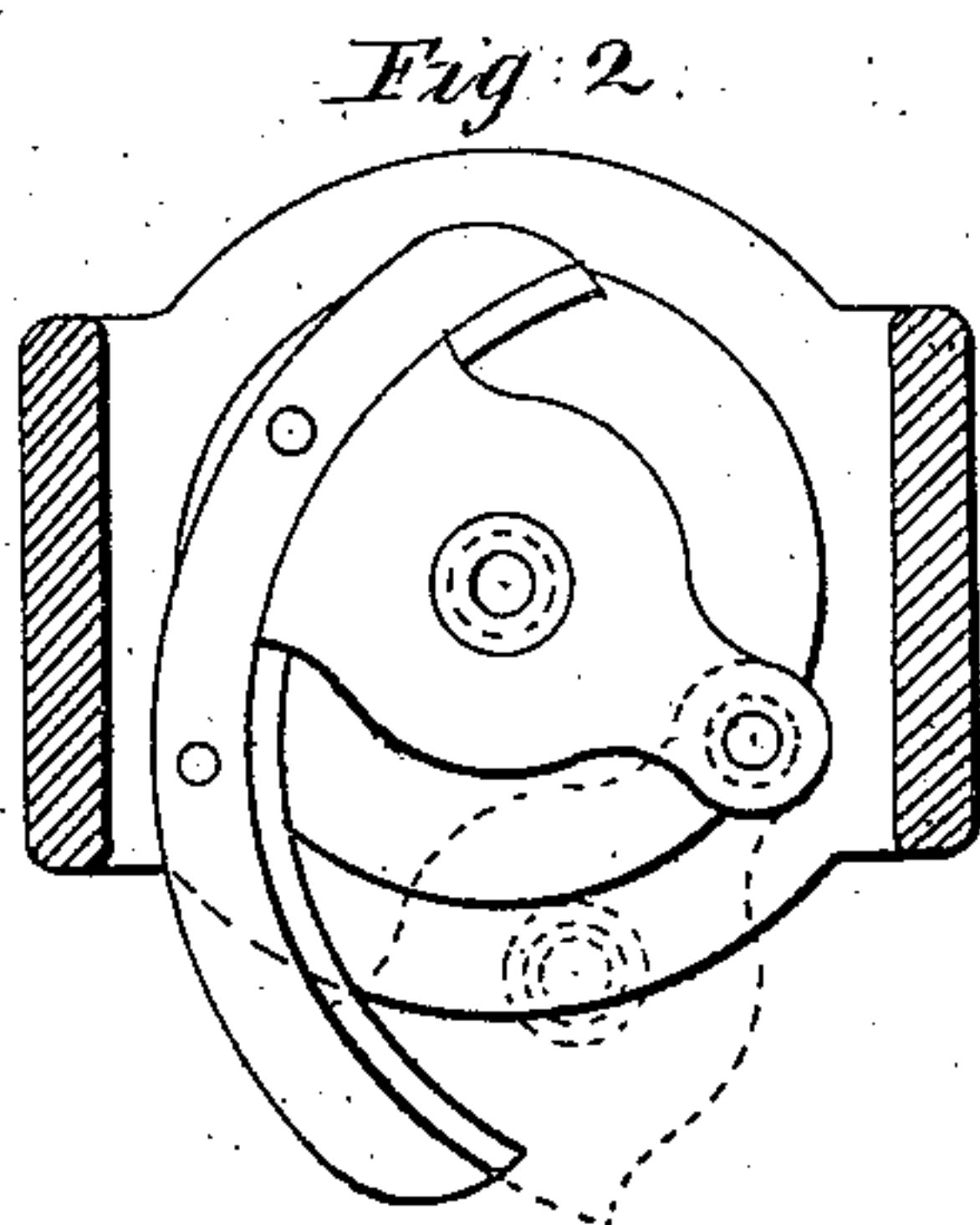
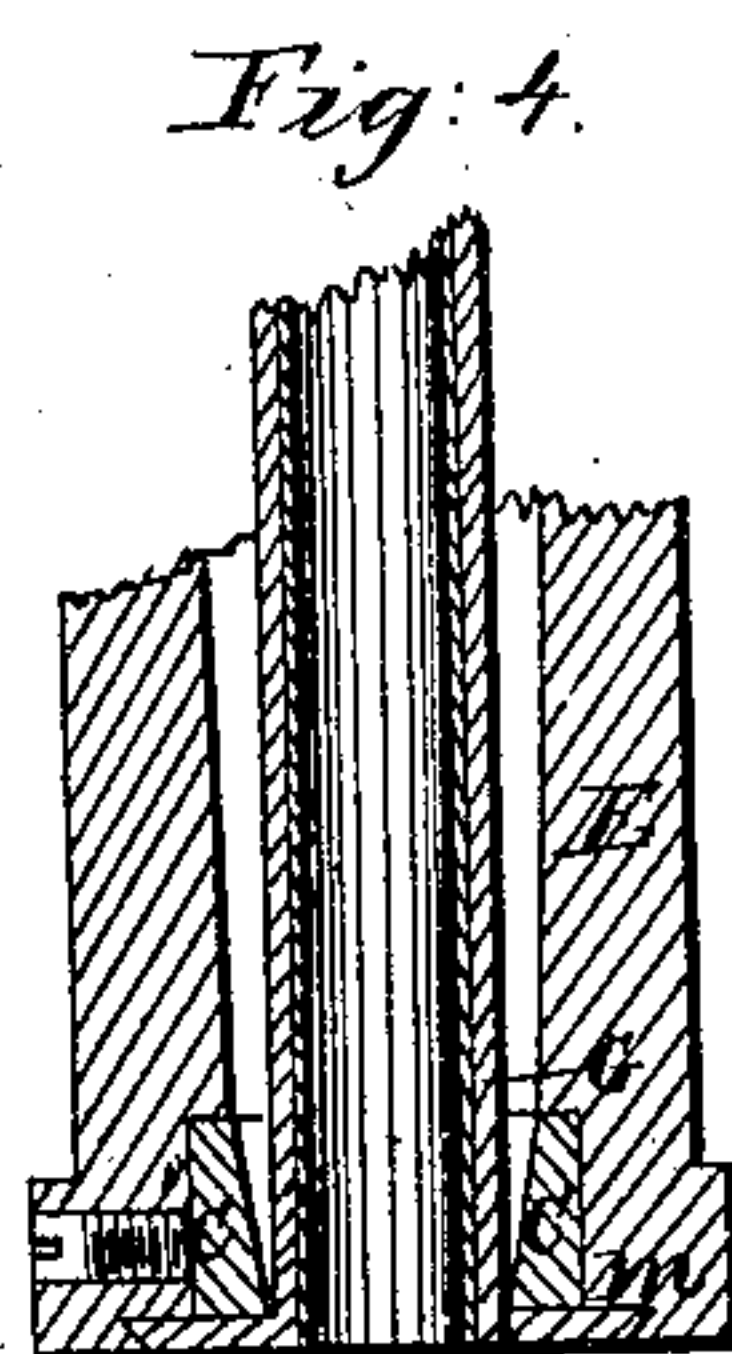
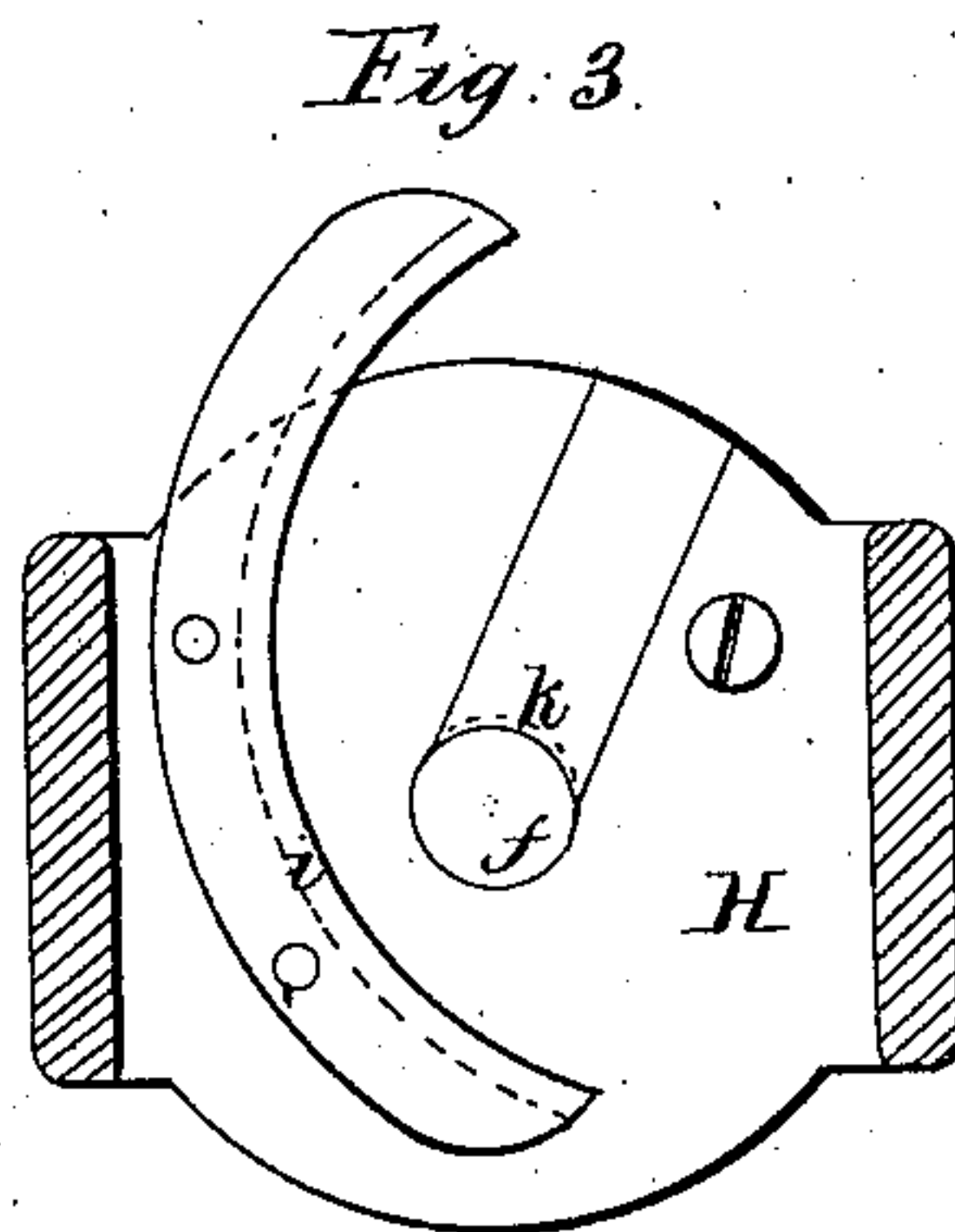
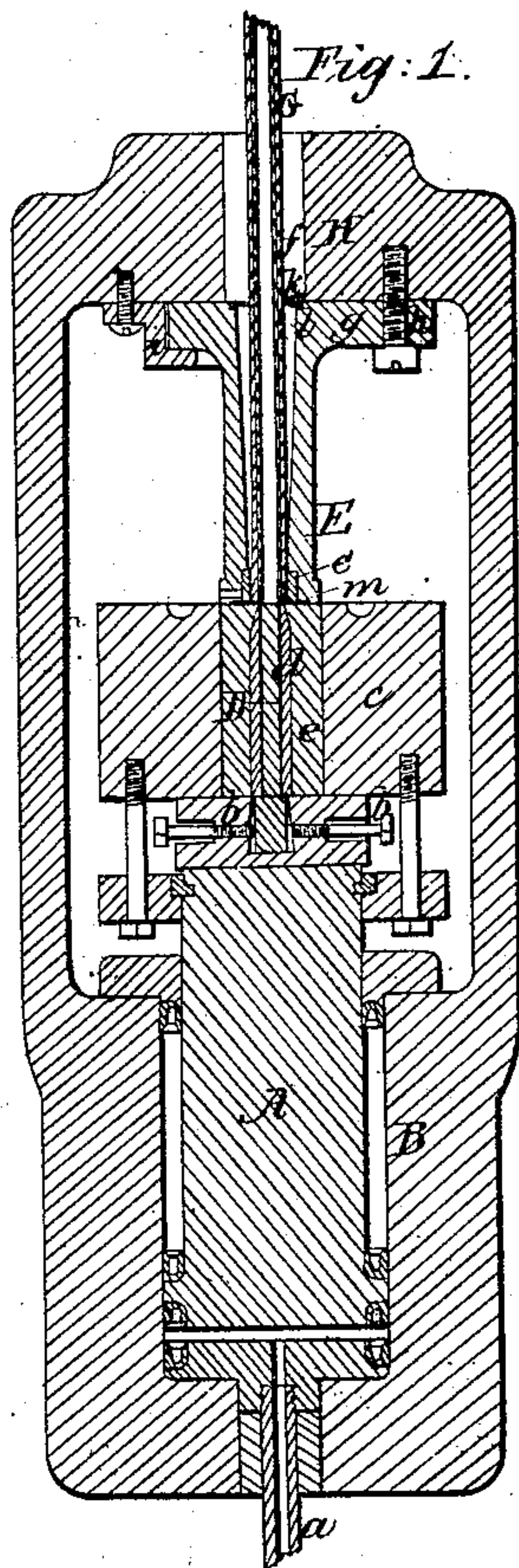


J. ROBERTSON.
MACHINE FOR MAKING TIN LINED LEAD PIPE.



Witnesses;
J. Brown
Geo. Haynes

Inventor,
J. Robertson.
per Brown & Haynes

The drawing in this patent
is not in print.

UNITED STATES PATENT OFFICE.

JOHN ROBERTSON, OF BROOKLYN, NEW YORK.

IMPROVED MACHINE FOR MAKING TIN-LINED LEAD PIPE.

Specification forming part of Letters Patent No. 90,872, dated June 1, 1869.

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in the Manufacture of Lead-Incased Tin Pipe, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 represents a vertical section of a press or apparatus for making lead-incased block-tin pipe constructed in accordance with my improvement; Fig. 2, a horizontal section taken immediately below the head of the press, and showing a plan of a swinging lead-ram attached thereto; Fig. 3, an inverted plan of the head portion of the press, in illustration of the knife secured thereto; and Fig. 4, a sectional view, on a larger scale, of the lower portion of the lead-ram, with a made pipe or remaining portion of a made pipe arranged therein after said ram has been slid or swung to one side of the lead-cylinder.

Similar letters of reference indicate corresponding parts.

My improvement has reference to the manufacture of lead-incased block-tin pipe by the combined action of a lead-cylinder containing the lead, and tin ingots or castings within it, a steel or other like core arranged to occupy an axial relationship to the cylinder, and a die or dies, through which the combined metals are forced, and that gage and give shape to the exterior of the pipe, while the core forms and gages the interior of it, the tin ingot, through which the core passes, being surrounded or incased by the lead ingot, and the necessary power to force out said metals through the die or dies being effected by hydraulic pressure or action.

In this connection the invention consists in a peculiar construction of the base of the lead-ram, whereby the slug or remnant of the lead ingot is retained or held by it and the friction of the pipe in the lead-ram, so that said slug may be afterward cut or removed from the pipe or after portion of it, instead of being retained in the cylinder to be worked up with a succeeding ingot, which latter utilization of the slug or remnant makes imperfect pipe; secondly, the invention consists in the combination of a knife in the head of the press and a cutter in the top of the swinging or slid-

ing lead-ram, for cutting the pipe, by or through the lateral action of the ram, for the purpose of facilitating such adjustment of the latter.

Referring to the accompanying drawings, A represents the water-ram, and B the water-cylinder, of the press, into which water is supplied or forced through a pipe, *a*, at its base by pump or otherwise. This ram serves to carry on its top, by or through suitable connections, the lead cylinder C and core D, the latter being centered and held within the cylinder C by lower set screws, *b b*, and being changed, if necessary, by a different core when a different-sized pipe is required. The upper end of this core D is represented as lying flush with the top of the lead cylinder, which the lead-ram E, carrying a die, *c*, at its base, is just arranged to clear, thus at the commencement of the work bringing the top of the core and bottom of the die or dies flush, or nearly so. Said die is held to its place by a set screw or screws, so that when the lead-ram is swung or slid to one side, as hereinafter described, it may be changed for a die of different size, if required, such swinging or sliding of the lead-ram also facilitating the changing of the core, besides possessing other advantages, which will be hereinafter explained.

The tin or tin ingot *d* may either be cast alone or run into the lead ingot *e*, and said castings, when prepared ready for putting into the cylinder, as represented in Fig. 1, may be kept till required to be made into pipe in an oven of a proper temperature, but not so as to fuse any portion of them. The lead-cylinder C may also be kept at a given temperature by any known means for keeping the ingots at a uniform heat in working them into pipe. The pipe G, as it is made by the ascent of the lead-cylinder and its core, acting in concert with the stationary lead-ram and its die or dies, is forced or delivered up through the hollow of the ram and out through a hole, *f*, in the head H of the press.

It is an important feature in this arrangement that while the lead-cylinder and its core travel, the lead-ram E with its die or dies remains stationary, and that said ram has a firm bearing against or under the head H of the press.

To economize time and labor in working under such an arrangement of parts or devices, I attach said ram to the head H of the press

in such manner as that it may be slid or swung out horizontally. Thus said ram may be formed or provided with a top plate, *g*, pivoted, as at *h*, to the head of the press, and suitably supported on a track or way, *i*, so that it may be swung to one side, out of line with the lead-cylinder *C*, as shown by red lines in Fig. 2, and whereby the castings or ingots may be put into said cylinder without backing the full length of them, or otherwise lowering the water-ram a greater distance than is necessary for the lead-ram to clear the top of it. As the core always remains stationary in the lead-cylinder the ingots or castings may very readily be dropped to their place in the lead-cylinder when the lead-ram is slid or swung to one side, as described. Before, however, said ram is fully moved to one side the pipe previously made in it may be clipped or cut at a point or on a level a little below the head of such ram or upper surface of the plate on its top, to allow of the ram being freely slid or swung laterally. This I effect by arranging in the head *H* a knife, *k*, and providing the top of the lead-ram with a ring or other suitable cutter, *l*, whereby the swinging of the ram to facilitate charging of the lead-cylinder effects the cut of the pipe.

In the bottom of the lead-ram, immediately below the die or dies therein, I cut or form a dovetail or other suitably-shaped cavity, *m*, of such character as that in the finishing portion of the upstroke of the lead-cylinder the slug

or remnant of the casting therein is forced or pressed into said cavity and there retained, the frictional hold or fit of the pipe or portion of it in the lead-ram aiding to effect such retention. After the ram *E* has been swung to one side the portion of the pipe in said ram, with the slug or remnant attached to it, may be forced or driven out and the slug cut off. In this way no pipe is lost, whereas the leaving of the slug or remnant of ~~one~~ charge in the lead-cylinder to be worked up in connection with a succeeding charge invariably produces a long defective portion in the pipe.

This mode of producing lead-in-cased tin pipe is superior to making it with a long core-holder, which has to be drawn the full length of the cylinder away from the ram before the castings can be put into the cylinder, and then the core require to be pushed back through the casting to its original position relatively to the ram.

What is here claimed as new, and desired to be secured by Letters Patent, is—

1. The improved laterally-swinging die-holding ram *E*, having a countersink or cavity, *m*, as and for the purpose specified.

2. The arrangement of the swinging lead-ram *E*, knives *k l*, and stationary frame *H*, in the manner shown and described.

JOHN ROBERTSON.

Witnesses:

FRED. HAYNES,
HENRY PALMER.