

No. 629,817.

Patented Aug. 1, 1899.

A. PRYM.

APPARATUS FOR CONVERTING LIQUID METAL INTO HOLLOW ARTICLES OR STRIPS OF METAL.

(No Model.)

(Application filed Jan. 11, 1899.)

Fig. 1.

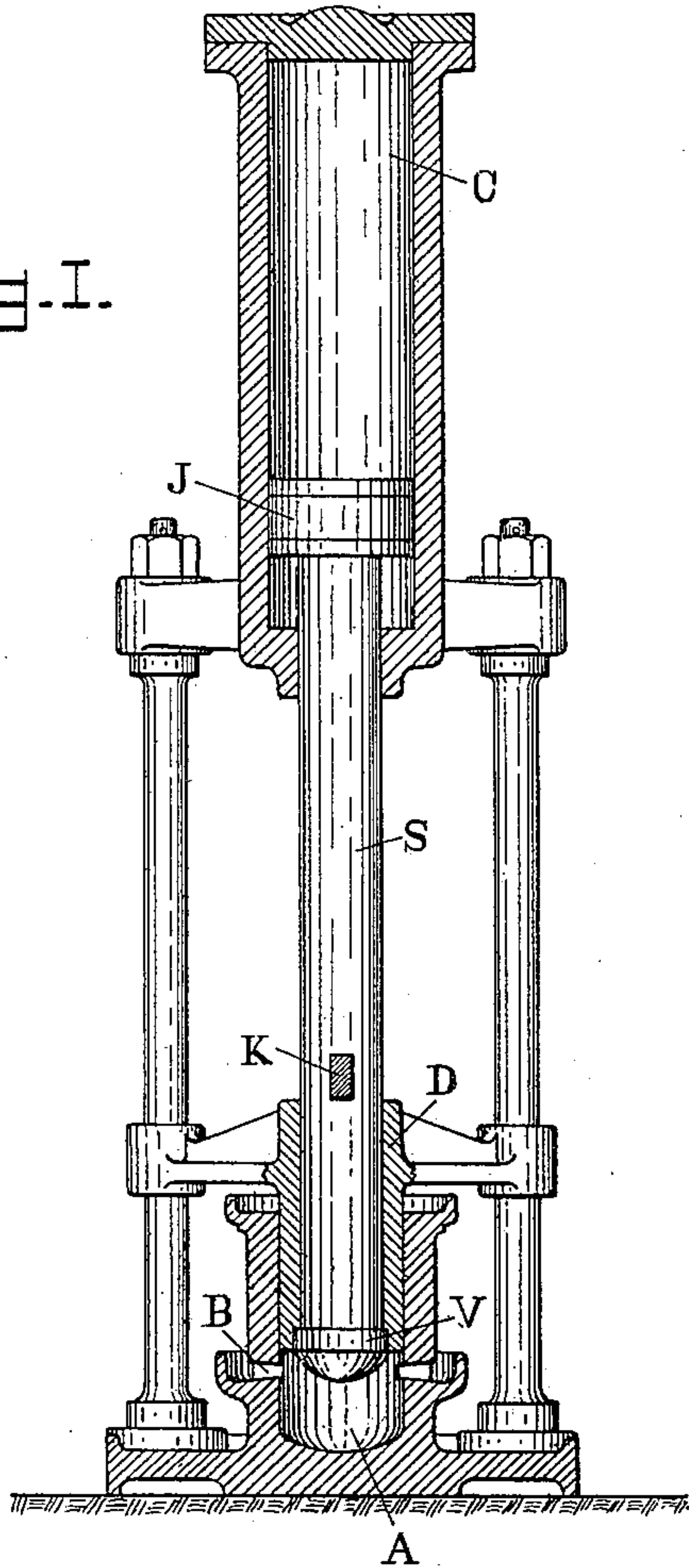
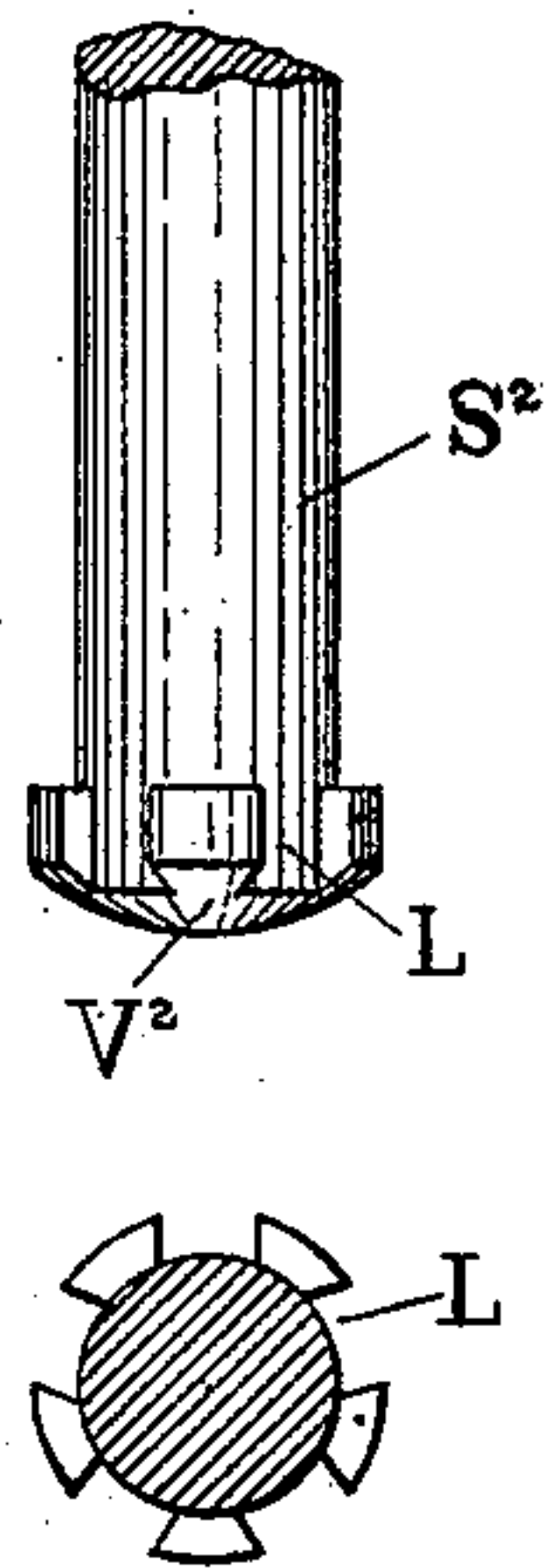


Fig. 2.



Witnesses:

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APPARATUS FOR CONVERTING LIQUID METAL INTO HOLLOW ARTICLES OR STRIPS OF METAL.

SPECIFICATION forming part of Letters Patent No. 629,817, dated August 1, 1899.

Application filed January 11, 1899. Serial No. 701,825. (No model.)

To all whom it may concern:

Be it known that I, AUGUST PRYM, manufacturer, a citizen of Germany, residing at Stolberg, Rhineland, Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Means for Converting Liquid Metal into Hollow Articles or Strips of Metal; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide means for converting liquid metal into hollow articles or strips of metal consisting of pure and homogeneous metal of great density with only a single heating operation, the upper part of the fused metal being removed and the remainder being then subjected to a strong hydraulic pressure. The subsequent conversion into the form desired takes place in the usual manner in which such articles—as, for instance, projectiles—are generally made from molten metal, the only difference being that in the process according to this invention the material does not escape freely from the press-cylinder, but is forced out under a counter-pressure.

The accompanying drawings show my invention in the best form now known to me; but many changes in the details might be made by a skilful mechanic without departing from the spirit of my invention as set forth in the claims at the end of this specification.

Figure 1 is a vertical section of an apparatus vertically arranged and serving for said process, and Fig. 2 is a special form of the pressing-plunger for manufacturing strips of metal.

In the vertically-arranged apparatus, Fig. 1, A is a press-cylinder for taking up the liquid metal. In it is a plunger S, on which the pressure-sleeve D is secured by means of a removable key K. In the cylinder C moves piston J, part of plunger S. On the end of plunger S which moves in the cylinder A a head V is arranged. The cylinder A has side openings B.

For manufacturing strips of metal the head V² of the press-plunger S² has apertures L, Fig. 2.

When liquid metal is introduced into the

cylinder A until its level reaches openings B, formed therein, plunger S, on which sleeve D is adjustably mounted and secured by means of a removable key K, is lowered, whereupon a certain amount of metal is displaced by the plunger-head V and forced out through the openings B. This continues until the lower edge of sleeve D closes the openings B. All slag and impurities floating on the surface of the fused metal are thus removed. The closure of the passages B is effected by the exuding slags, impurities of the metal, and small quantities of the metal itself, which, as experience teaches, chill quickly enough to make any special means for closing the passages unnecessary. Plunger S, together with sleeve D, is forced down by hydraulic pressure acting upon piston J in the pressure-cylinder C, so that the metal is strongly compressed. After the metal has been condensed the key K is removed and sleeve D becomes free. The pressure in the hydraulic cylinder C is then increased and the metal forced upward along the sides of the cylinder A. The rising metal has to force out sleeve D. After the metal has been suitably forced out the hydraulic pressure is cut off from above the piston J and pressure applied below it. The piston then rises, together with the plunger S, and withdraws the compressed hollow article until sleeve D strikes against the end of pressure-cylinder C. The plunger S, however, continues to move, and the sleeve D effects the final removal of the hollow object. The apparatus is then ready for receiving a fresh quantity of molten metal and repeating the operation described.

It is obvious that metal can be pressed out by means of this apparatus into other than hollow forms. For instance, it may be pressed into strips, in which case the plunger-head must be suitably shaped, as illustrated in Fig. 2.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An apparatus to convert liquid metal into hollow articles, comprising in combination with a hydraulic pressure-cylinder C, a plunger S, a piston J and pressure-head V, both of which are securely mounted on the respective ends of said plunger, a cylinder A

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adapted to receive liquid metal, openings B in said cylinder to serve as overflow for the slag and impurities of the liquid metal, a sleeve D adjustably mounted and longitudinally movable in cylinder A, and a removable key K seated in plunger S, by means of which said sleeve is secured to plunger S, substantially as described.

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10 2. An apparatus to convert liquid metal into strips of metal, comprising in combination with a hydraulic pressure-cylinder C, a plunger S², a piston J and a pressure-head V², both of which are securely mounted on the respective ends of said plunger, suitably-
15 shaped notches L in the pressure-head V², a

cylinder A adapted to receive liquid metal openings B in said cylinder to serve as overflow for the slag and impurities of the liquid metal, a sleeve D adjustably mounted and longitudinally movable in cylinder A, and a removable key K seated in plunger S², by means of which said sleeve is secured to the plunger S², substantially as described. 20

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

AUGUST PRYM.

Witnesses:

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