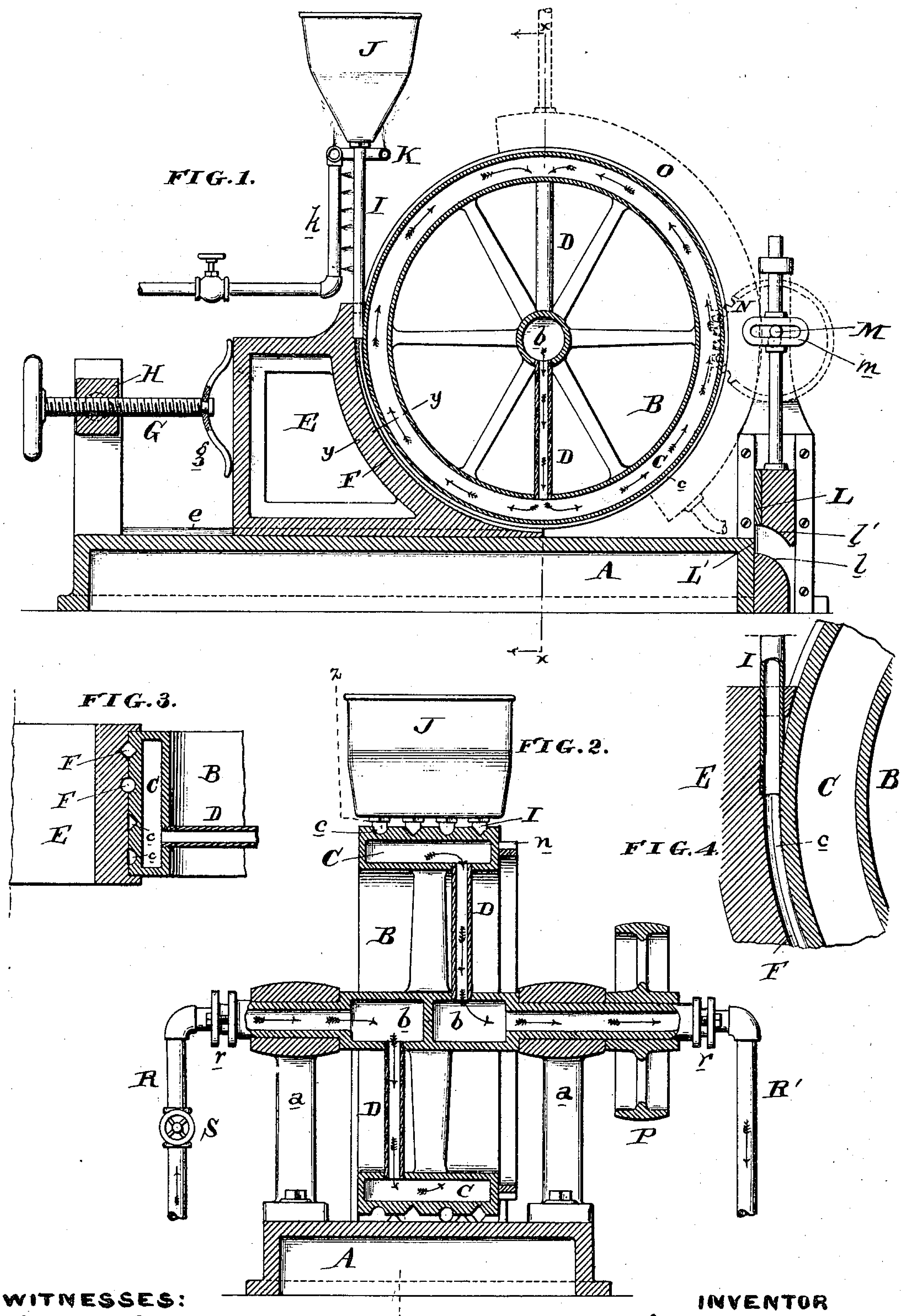
(No Model.)

T. J. CLOSE.

MACHINE FOR CASTING METALS.

No. 441,643. Patented Dec. 2, 1890.



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MACHINE FOR CASTING METALS.

SPECIFICATION forming part of Letters Patent No. 441,643, dated December 2, 1890.

Application filed September 5, 1889. Serial No. 323,087. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. CLOSE, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in a Machine for Casting Metals, of which the following is a specification.

My invention relates to machines for casting metals; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

More particularly my invention is concerned with the casting of metal in the form of strips or wires, and is especially adapted to the casting of solder in wire form for use in can-soldering and similar operations.

My invention is not limited, however, to the casting of any particular kind of metal.

The object of my apparatus is to draw out the metal while in a heated and ductile state into the strip or wire form, at the same time molding or casting it into the desired shape in cross-section, and causing it to become cool and hardened. This cross-sectional shape which is given to the metal varies according to the use to which the metal is to be put, and my apparatus may be made to cast the metal into any shape desired.

In carrying out my invention I employ a wheel or rotating part and a stationary part relative thereto with grooves or molds for casting the metal formed in their surfaces, into which the metal, in a heated and highly-ductile condition, is introduced from suitable feeding devices. The molding-grooves may be formed entirely upon the periphery of the wheel or rotating part, or partially in the wheel and partially in the stationary part, according to the cross-sectional shape which it is desired to impart to the metal. The motion of the rotary part draws out the metal from the feeding devices into the molding-grooves, casting it into the desired shape, and by means of suitable cooling devices the metal is cooled and hardened.

Solder used in canning operations is usually cut into short segmental pieces, and for the purpose of cutting and forming the metal into this shape I employ a cutter and former operating in unison with the casting devices and adapted to receive the cast solder as it is drawn out by the wheel and to cut it into the proper lengths and form it into the desired shape, the details of which are more particularly set out hereinafter.

In the drawings, Figure 1 is a sectional side elevation of my improved apparatus on the line *z z* of Fig. 2. Fig. 2 is a vertical sectional view of the same on the line *x x* of Fig. 1. Fig. 3 is a cross-sectional view through the stationary and rotatable mold on the line *y y* of Fig. 1; and Fig. 4 is a sectional side elevation, on an enlarged scale, of a portion of Fig. 1, illustrating the manner of introducing the molten metal into the molds.

A is the main frame of the machine, provided with uprights or supports *a a*, in which is journaled a wheel or cylinder B. This cylinder is provided on its periphery with one or more continuous grooves *c*, the shape of which conforms to the cross-section of the cast wire.

E is a frame working on suitable guides *e* on the frame A and having a curved surface adapted to fit snugly against the grooved periphery of the wheel or cylinder B. The length of this curved surface of the frame E in contact with the periphery of the wheel B is preferably one-quarter of the circumference of the wheel, as shown. This curved surface may be provided with grooves or recesses F F, corresponding to the shape of the grooves *c c* in the wheel B, and adapted to fit evenly with them to form the molds for the metal, as shown in the upper part of Fig. 3, or the face of the curved surface may be smooth and the molds formed entirely within the periphery of the wheel B, as shown in the lower portion of Fig. 3, according to the shape to be given to the cast metal. The frame E is movable to or from the wheel B on the guides *e*.

H is a pivoted block on an upright of the frame A, carrying an adjusting-screw G, which is provided on its end with a spring *g*, adapted to press against the frame E to hold it in contact with the wheel B. By means of the adjusting-screw G the contact between the periphery of the cylinder B and the curved face of the frame E may be regulated, while by means of the pivoted block H the screw G may be swung out of the way when it is desired to move the frame E.

J is a receptacle or trough to contain the

metal, having one or more feeding-tubes I opening into the molds formed between the wheel B and frame E to introduce the metal therein, the opening to the mold in the frame E being slightly enlarged to receive the end of the tube I, so that the sectional area of the passage-way of the tube I may be the same as that of the mold in order that the exact quantity of metal may be introduced. I prefer that the tubes I should be arranged tangentially to the surface of the wheel B, as shown in Fig. 4, for the purpose of more conveniently introducing the metal and allowing it to run down into the molds.

K are gas or heating pipes about the base of the trough or receptacle J to keep the metal therein in a molten state. I prefer to arrange these pipes with portions *k* arranged in proximity to the tubes I to keep them in a heated condition and prevent the hardening of the metal before it is introduced into the molds.

In practice I prefer to form the grooves *c* slightly roughened to increase the friction between the metal to be cast and the surface of the grooves, that the metal may be more easily drawn out by the rotation of the wheel or cylinder B.

C is a hollow annular water-chamber formed within the periphery of the wheel B and connecting by means of tubes D with the hollow hub *b*. This hollow hub *b* is formed with a partition dividing it into compartments connected, respectively, with opposite portions of the annular chamber C by the tubes D, so that the water entering the hub upon one side may pass through one tube D into the chamber C, and may circulate thence through the other tube D out through the other side of the hub *b*, as indicated by the arrows in Fig. 2.

R R′ are water inlet and outlet pipes, respectively, opening into the hollow hub *b* through the water-tight stuffing-boxes *r*.

S is a valve to control the flow of water. By these devices water is caused to circulate through the chamber C in the wheel B, for the purpose of keeping the periphery cool to harden the metal in the molds.

In dotted lines in Fig. 1 is shown a modification of the devices for cooling the periphery of the wheel, consisting of a metallic chamber O, arranged in contact with the surface of the wheel B, through which a flow of cold water is maintained. It is apparent, however, that the devices for accomplishing this cooling of the rotary portion of the mold may be varied in many other ways without changing the character of my invention, which consists, broadly, in the combination of the rotary and stationary molding-surfaces between which the metal is cast and drawn out into the desired shape.

For the purpose of cutting and forming the cast metal into the segmental pieces of short length heretofore referred to, I employ a reciprocating cutter L and former *l′*, adapted to cut off the metal into the proper length and shape it by pressing it against the curved surface of the die *l*.

Motion may be imparted to the reciprocating cutter and former by means of a cam or eccentric pin M, carried upon a pinion N and working in a slotted part *m*, carried by the cutter and former. The pinion N is driven by the gearing *n*, carried on the shaft *b*.

P is the driving-wheel by which motion is imparted to the wheel or cylinder B.

The operation of the machine will now be readily understood. The metal from the trough J, kept in a molten state by the heating-pipes K and *k*, is allowed to flow into the molds *c* F, and the rotation of the wheel B draws out the metal into the wire or strip shape, which is cooled and hardened in the manner heretofore described and conveyed by the rotation of the wheel B to the former and cutter L *l l′*, where it is cut and formed into the proper lengths.

I prefer the details of construction which are here shown, but do not desire to limit my invention to them, as it is apparent that they may be modified in many ways without departing from the principles of it.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a metal-molding machine, the combination of a rotary cylinder provided with molding-grooves, a frame independent of said rotary cylinder movable to and from it, having a curved face adapted to be brought in contact therewith, a spring pressing against said movable frame to press its surface in contact with the periphery of the cylinder with a yielding pressure, an adjusting-screw to adjust the pressure of the spring, a pivoted block carrying the adjusting-screw, and means to introduce metal in a molten state into the molding-grooves.

2. In a metal-molding machine, the combination of a rotary cylinder having a grooved periphery, a frame having a curved surface provided with grooves and adapted to be brought in contact with the periphery of the cylinder, with its grooves coinciding with the grooves of the cylinder to form molding-spaces, and one or more supply-pipes for the molten metal projecting down into said molding-spaces and fitting tightly, the upper portions of said grooves in the frame being slightly enlarged to receive the ends of the pipes, the sectional area of the passage-way of which is equal to the sectional area of the molding-spaces.

3. In a machine for molding metal, the combination, with a rotary wheel or cylinder, of a frame having a curved surface adapted to be brought in contact with the periphery of said wheel or cylinder, and molds formed between said adjacent surfaces into which the metal is introduced to be formed into strips, a cutter to cut said strips into short lengths, and a former to form said strips when cut into a curved or segmental shape, and driv-

ing-connections between said cutter and former and wheel.

4. The combination of a frame having a curved surface, a wheel or cylinder the periphery of which rotates in contact with the curved surface of said frame, molding-grooves formed between said adjacent surfaces, an annular water-chamber formed within the periphery of said wheel, a hollow hub for said wheel divided into two compartments by a central partition, connecting-passages between the two compartments of said hub and water-chamber, and inlet and outlet pipes for the water opening into the opposite ends of said hub.

In testimony of which invention I have hereunto set my hand.

THOMAS J. CLOSE.

Witnesses:
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ERNEST HOWARD HUNTER.