

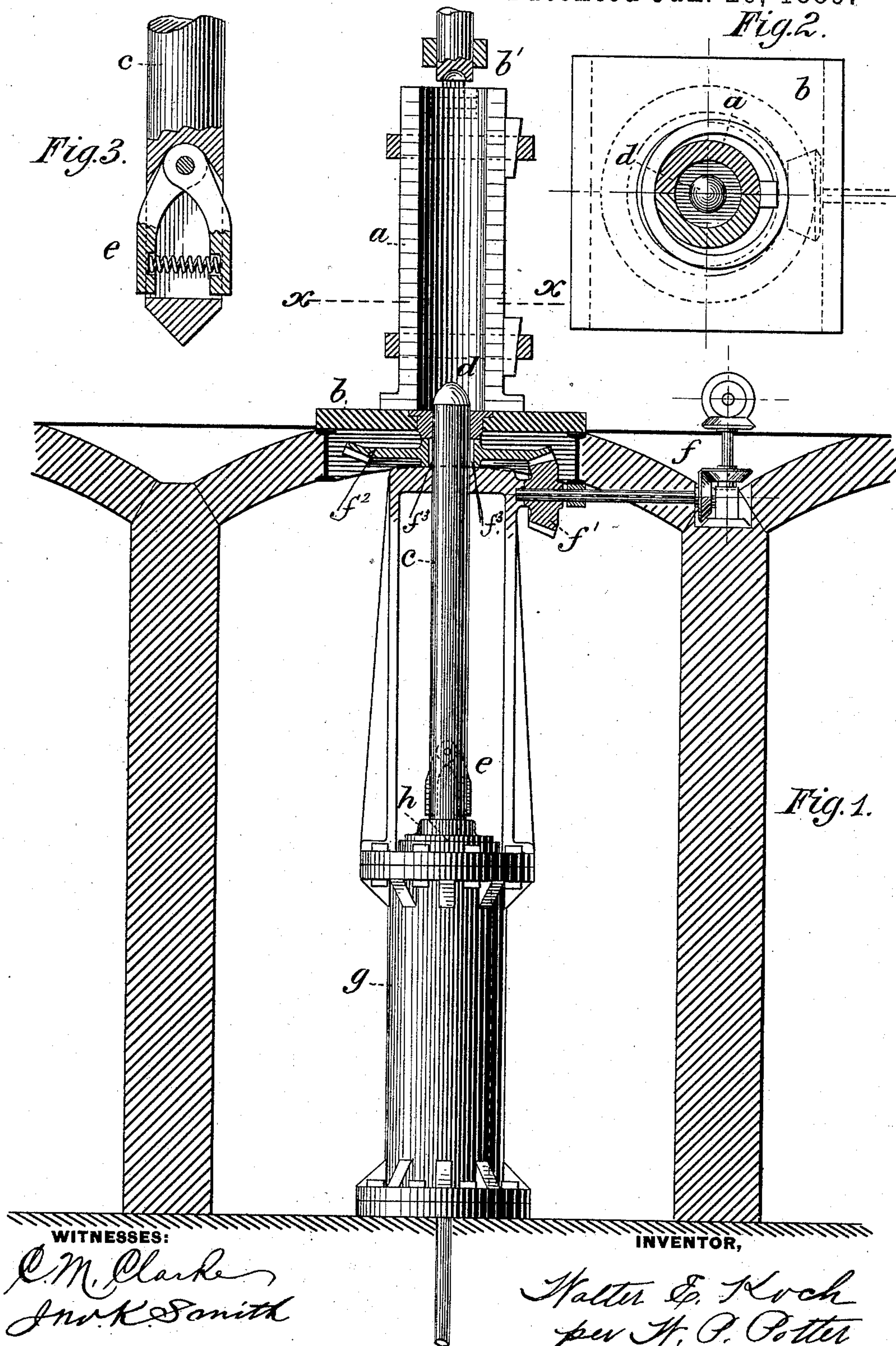
(No Model.)

W. E. KOCH.

APPARATUS FOR CASTING STEEL PIPES.

No. 396,747.

Patented Jan. 29, 1889.



WITNESSES:

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Att'y.



# UNITED STATES PATENT OFFICE.

WALTER E. KOCH, OF SHARPSBURG, PENNSYLVANIA.

## APPARATUS FOR CASTING STEEL PIPES.

SPECIFICATION forming part of Letters Patent No. 396,747, dated January 29, 1889.

Application filed May 8, 1888. Serial No. 273,162. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER E. KOCH, of Sharpsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Apparatus for Casting Steel Pipes; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view, partly in elevation and partly in section, of my improved apparatus for casting steel tubes. Fig. 2 is a cross-section taken on the line  $x x$  of Fig. 1 the same being shown as at a time when the mold is charged. Fig. 3 is a detailed view of the portion of the spindle bearing spring-fins for engagement with the bevel-wheels.

My invention relates to an improved apparatus for making solid tubes of cast-steel; and it consists in the arrangement and construction of parts, as hereinafter pointed out and described.

Referring to the drawings, I represent at  $a$  an iron mold, which may be either split or solid, but which is preferably a split mold. This is set firmly on a base,  $b$ , over a pit suitably arranged and fitted to contain a hydraulic ram and cylinder. The base  $b$  has an opening for the passage through it of a spindle,  $c$ , which is fitted loosely in the ram  $h$  of the hydraulic cylinder  $g$  in such a manner that the spindle  $c$  may be readily elevated into the mold by any suitable means.

On the top of the spindle  $c$  is fixed a knob,  $d$ , of fire-clay, for the purpose of preventing fusion of the end of the spindle when in contact with the molten steel. The spindle  $c$  also has a bearing at the top of the mold at  $b'$ , which receives and steadies it when elevated and in process of rotation. At  $e$ , on the lower portion of the body of the spindle, are adjusted the spring-fins, which are shown more in detail in Fig. 3.

At  $f$  are shown bevel-wheels connected with driving mechanism arranged to give rotation to the spindle  $c$  when elevated sufficiently to engage, by means of the spring-fins  $e$ , with slots  $f^3$  on the inner surface of the bevel-wheel  $f^2$ .

The mode of operation of my improvement

is as follows: The mold  $a$  and spindle  $c$  being in position, as shown in Fig. 1, with no portion of the spindle except the fire-clay knob  $d$  extending into the mold, I pour into the mold a sufficient quantity of molten metal to form the size of tube desired. Then when the metal has set sufficiently (which point will appear from the observation of the skilled workman) the spindle  $c$  is, by means of the hydraulic ram, pushed up through the yet molten core of metal into the bearing  $b'$ , and as soon as the spindle  $c$ , by means of the fins  $e$ , is in gear with the wheel  $f^2$  a slow rotation of the spindle is commenced. This action results in giving to the inner face of the hollow tube thus formed within the mold a smooth and planished finish. When in the judgment of the operator this result has been attained and the metal is sufficiently cooled, the spindle  $c$  may be withdrawn by reversing the operation of the hydraulic ram, the tube taken out of the mold, and the operation repeated as often as desired.

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

1. In an apparatus for casting steel tubes, the combination of a vertical mold, a vertical rotary spindle adapted to be forced into said mold from below, and mechanism for raising and rotating said spindle within the mold, substantially as specified.

2. The combination, with the vertical mold, of a solid spindle which closes the bottom of said mold and is capable of being raised and rotated in said mold, a bearing at the upper end of the mold to receive the upper end of the spindle, and mechanism for raising and rotating the spindle, substantially as specified.

3. The combination, with the vertically movable and rotating spindle  $c$ , of the spring-fins  $e$  at the lower end of said spindle, and the horizontal gear-wheel  $f^2$ , having seats in its hub into which the fins enter, whereby a slow rotation is given to the spindle when the same is raised into the mold, substantially as specified.

In testimony whereof I have hereunto set my hand.

WALTER E. KOCH.

Witnesses:

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