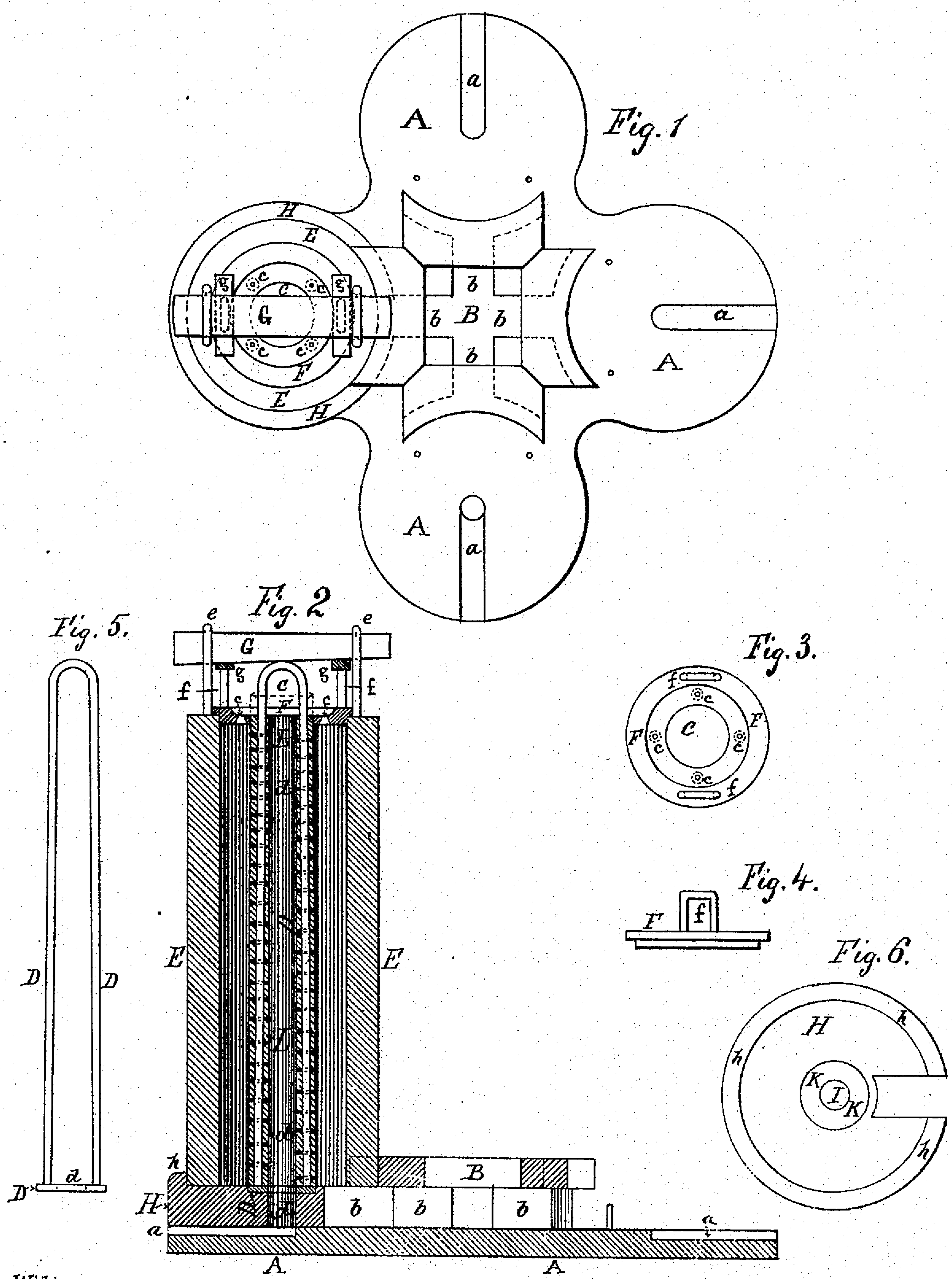
(Model.)

C. B. MORSE.

Mold and Core for Casting Hollow Ingots.

No. 235,796. Patented Dec. 21, 1880.



Witnesses:

Wm. F. Randel

James G. Smith

Inventor:

Cyrus B. Morse

By his Attorney

L. M. Morse

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CYRUS B. MORSE, OF RHINEBECK, NEW YORK.

MOLD AND CORE FOR CASTING HOLLOW INGOTS.

SPECIFICATION forming part of Letters Patent No. 235,796, dated December 21, 1880.

Application filed September 18, 1880. (Model.)

To all whom it may concern:

Be it known that I, CYRUS B. MORSE, of Rhinebeck, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Molds and Cores for Casting Hollow or Annular Ingots of Steel or Homogeneous Metal, of which the following is a specification.

The object of my invention is to overcome the difficulty hitherto experienced in casting steel or homogeneous metals in annular or tubular form free from gas or air cavities and imperfections caused thereby. This I accomplish by the construction and arrangement of a ventilated base and cap on the mold in connection with a ventilated hollow core having a combustible element and the metal entering the mold from the bottom.

In the accompanying drawings, which represent my mold, core, base, and cap, and their combination for casting hollow or angular ingots, Figure 1 is a plan view of the mold, core, base, and cap, and manner of connecting and securing the same to the runner-plate. Fig. 2 is a vertical section of the same. Fig. 3 is a plan view of the cap. Fig. 4 is a vertical section of the cap. Fig. 5 is a vertical section of the core-plate, rods, and loop. Fig. 6 is a plan view of the base.

In the drawings similar letters of reference represent like parts.

A is the runner-plate. *a a* are channel-openings in same. B is the center runner. *b b* are runners in base of mold, connecting with same. C is center opening in cap. *c c c c* are conical openings in same. D is the core-plate and connected rods and loop. *d* is the opening in the core-plate, and *d'* are the vents in the sides of the core. E is the mold. *e e* are the ears on same. F is the cap. *f f* are the ears on same. G is the bar that secures cap and core to mold. *g g* are small wedges for same. H is the base. *h* is the rim on same. I is the center hole through same. K is the circular recess to receive core-plate in same. L is the core.

The runner-plate A is provided with channel-openings *a a*, extending inward and connecting with the center hole, I, in the base of the mold to admit of a free escape of gas and air.

The base H has a rim, *h*, around it, to receive and hold in place the mold E. It has in its center a circular recess, K, to receive, center, and hold in place the lower end of the core L. In the center of this recess is a hole, I, running through the base H, forming, with the channel-openings *a a* in the runner-plate A and the opening *d* through the core-plate and vents *d'* in the core and cap C, a conduit for gas and air.

The core-plate has rods attached at opposite points. These rods are slightly longer than the core, and are united together, the top being arched, so as to form a loop above the core, for the purpose of carrying, setting, and holding the core in place. The core is made upon this plate around these rods, and has a hole through its center. The core is made of a mixture one element (for instance, unbolted flour, sawdust, pitch, &c.) of which is combustible, and the walls of the core are vented. The core is made slightly tapering from bottom up.

The top of the mold E is closed with a recessed cap, F, which fits inside of the mold and rests upon it. The cap has a hole through its center, C, to receive the core L and keep it central at the top of the mold. The cap F has conical openings or vents *c c c c*, to admit of the free escape of gas or air that may be between the mold and core while the metal is being poured. The cap F has two ears, *f f*, at opposite sides for the purpose of holding it in place.

The mold may be made of cast-iron or other suitable metal, may be of any convenient form, the interior to be slightly tapering from the bottom up. It is to be provided on the top with ears *e e* upon opposite sides, so constructed as to hold the bar G or other suitable device, to keep the cap and core in place. The cap F and core L are secured in place by a bar, G, passed through the ears *e e* on the mold E, over the top of the core-loop D, and over the ears *f f* of the cap F, the wedges *g g* making the connection firm and secure.

The metal enters the mold at the bottom *b b*, being poured through a center runner, B,

onnecting with each mold that may be in the luster. The gases and air escape through the onical openings in the cap and through the ents in the core. The gases which escape rough the vented core and the combustible lement of the core become ignited and are onsumed. The oxygen to support combus-on is supplied through the openings con-ected with the hollow core. A draft is thus stablished within the core and the gases are rawn through the vents and consumed.

The pressure caused by the metal being rced into the mold from the bottom up gainst the cap will solidify it.

What I claim is—

1. A mold having a ventilated base, in com-ination with a runner-plate and connecting hannel grooves or openings therein, and a ollow core to admit of the free passage of gas nd air through the base and core, substan-ally as and for the purpose described.

2. A hollow core having vents *d'* in its walls, in combination with a mold having a base and cap, substantially as and for the purpose described.

3. The combination of a mold with a ventilated base, ventilated cap, and hollow core having vents therein, substantially as and for the purpose described.

4. A hollow core having vents *d'* in its walls, and composed, in part, of combustible material, in combination with a mold having ventilating-openings at cap and base connected with the interior opening of the core, substantially as hereinbefore set forth.

CYRUS B. MORSE.

Witnesses:
THEODORE WENTZ,
WM. F. RANDEL.