

(No Model.)

2 Sheets—Sheet 1.

G. A. GOODWIN & W. F. HOW.
FOUNDRY LADLE.

No. 377,747.

Patented Feb. 14, 1888.

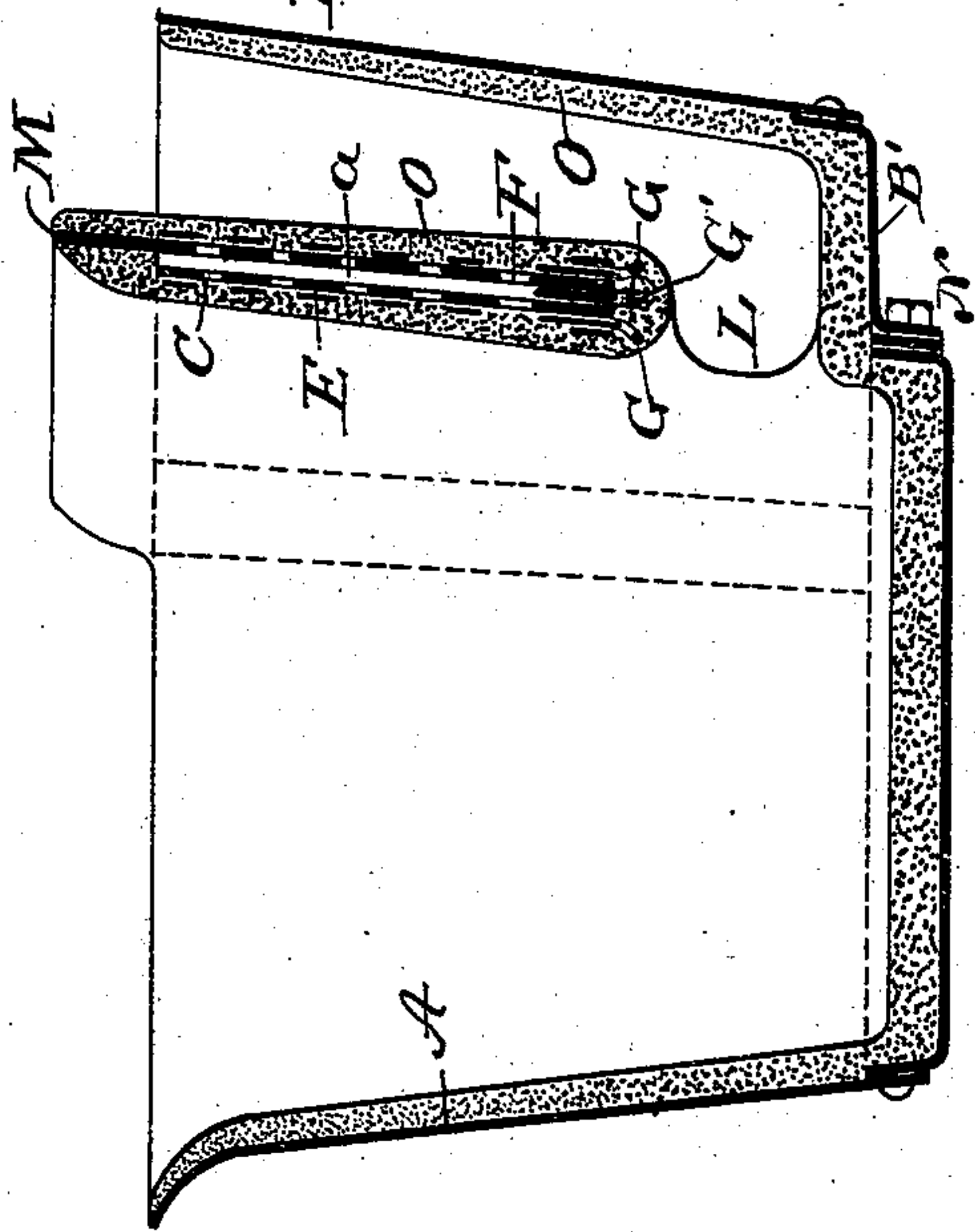


Fig. 3.

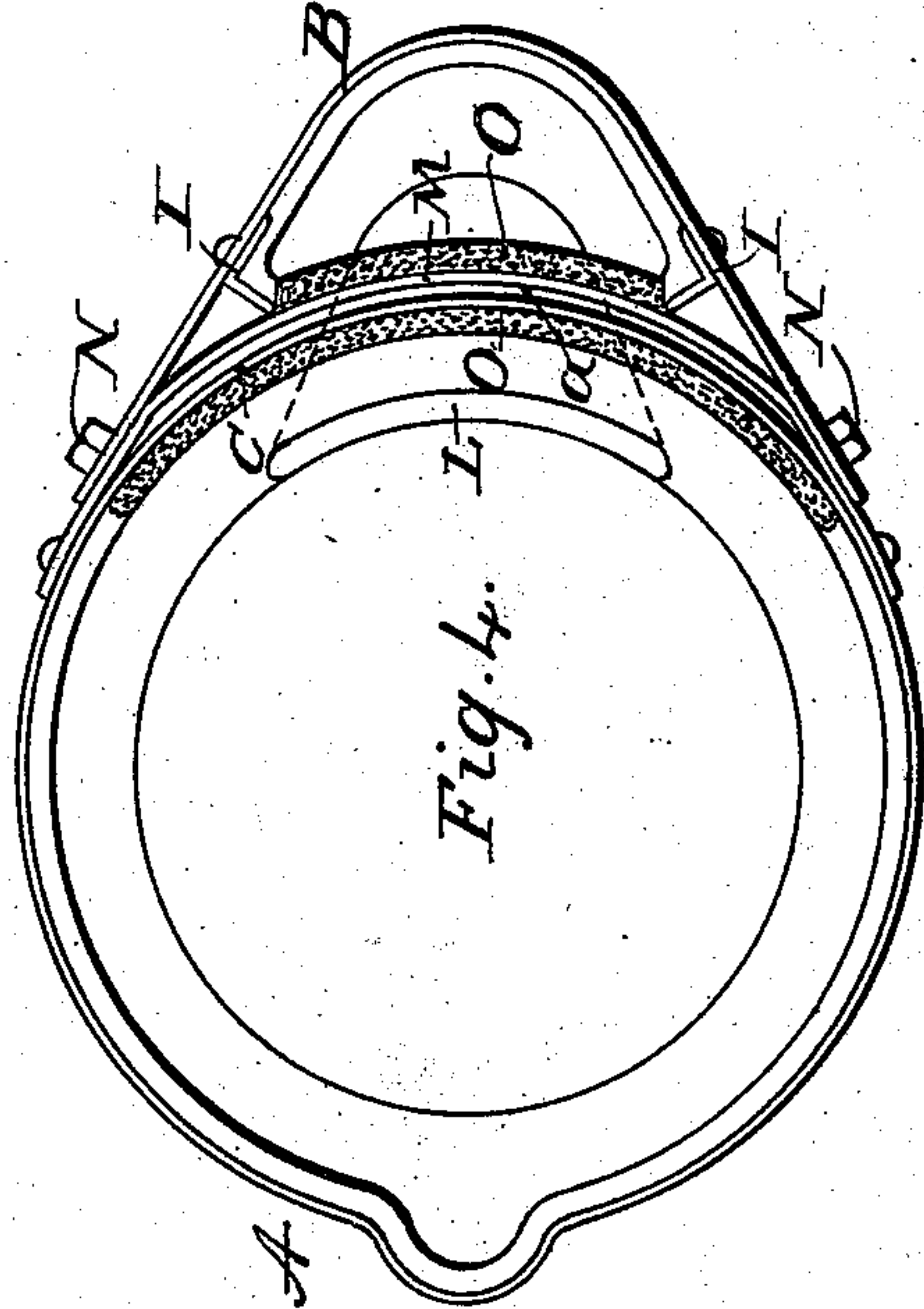


Fig. 4.

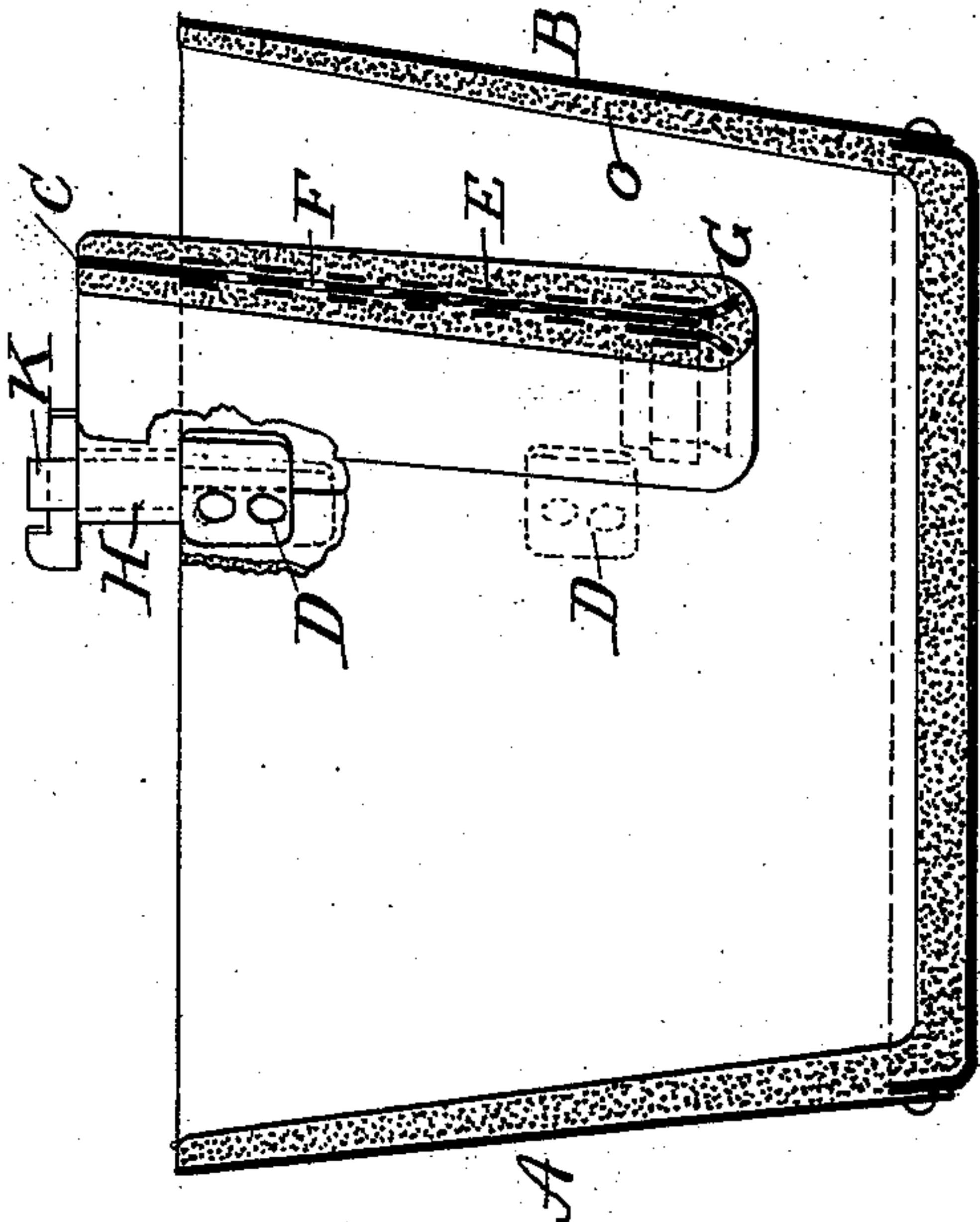


Fig. 1.

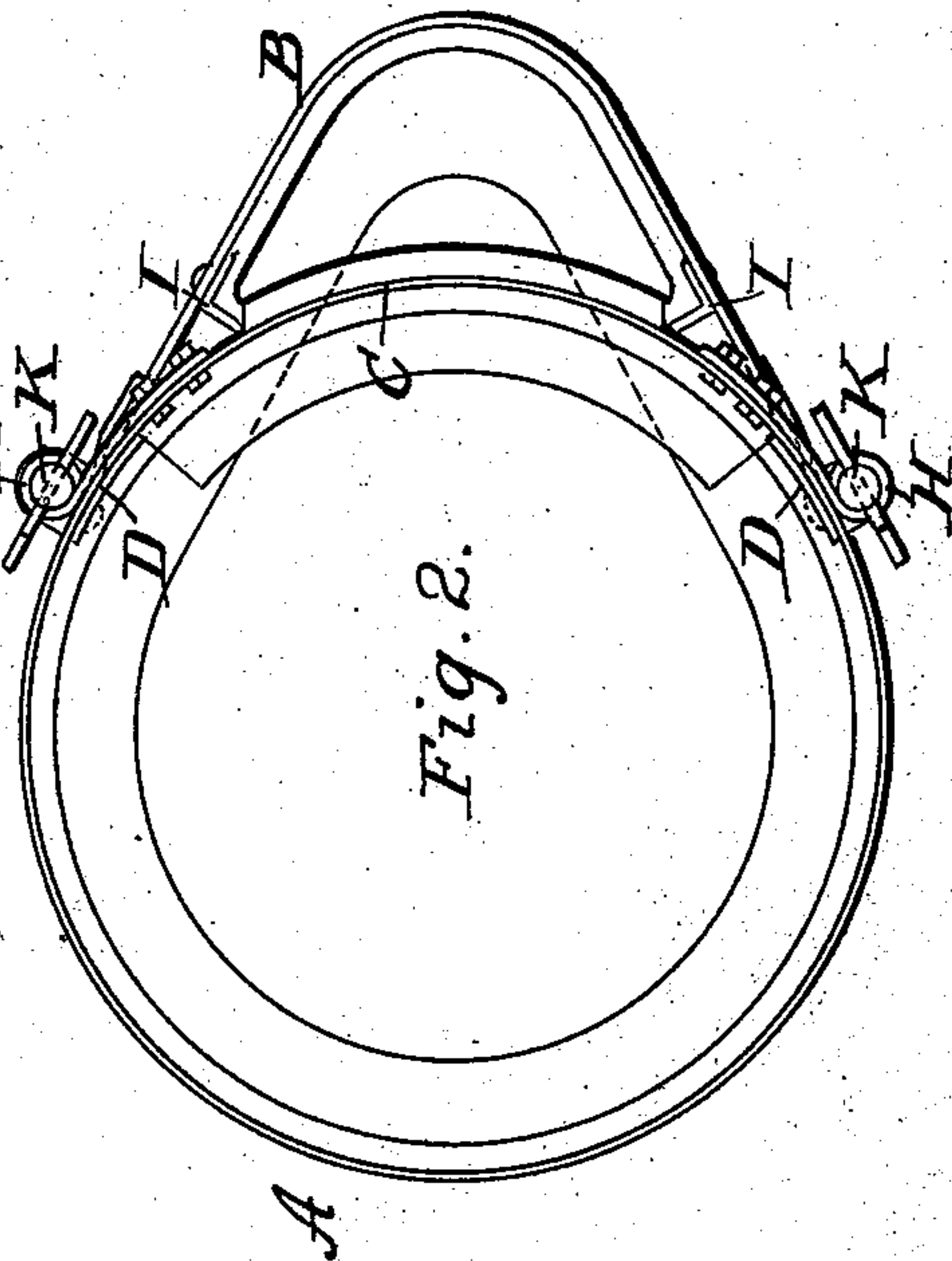


Fig. 2.

Witnesses:
Lloyd B. Knight.
Alex. Scott.

Inventors.
GEORGE ABRAHAM GOODWIN,
WILLIAM FIELD HOW,
By their Attorney *M. L. Ewing.*

(No Model.)

2 Sheets—Sheet 2.

G. A. GOODWIN & W. F. HOW
FOUNDRY LADLE.

No. 377,747.

Patented Feb. 14, 1888.

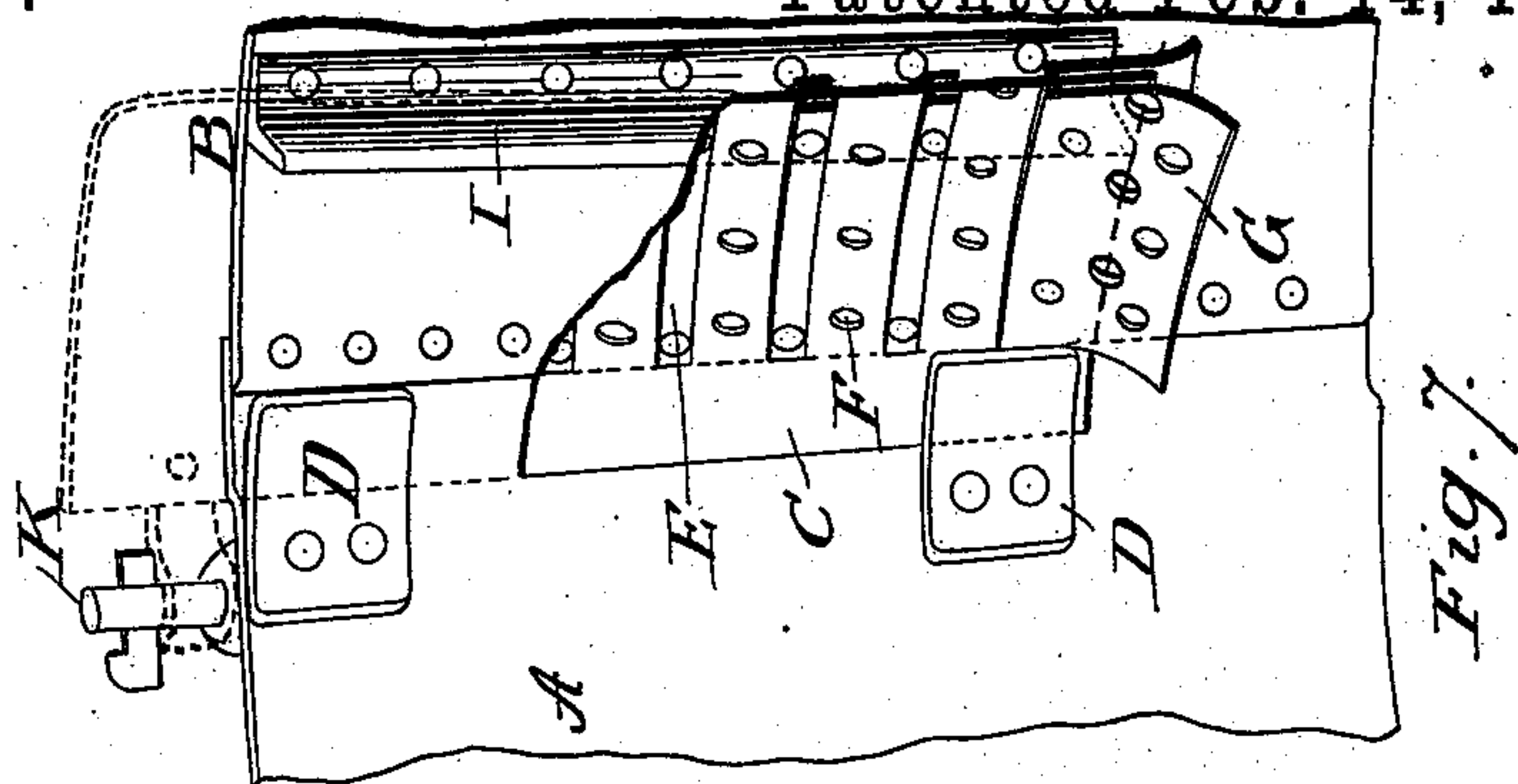


Fig. 7.

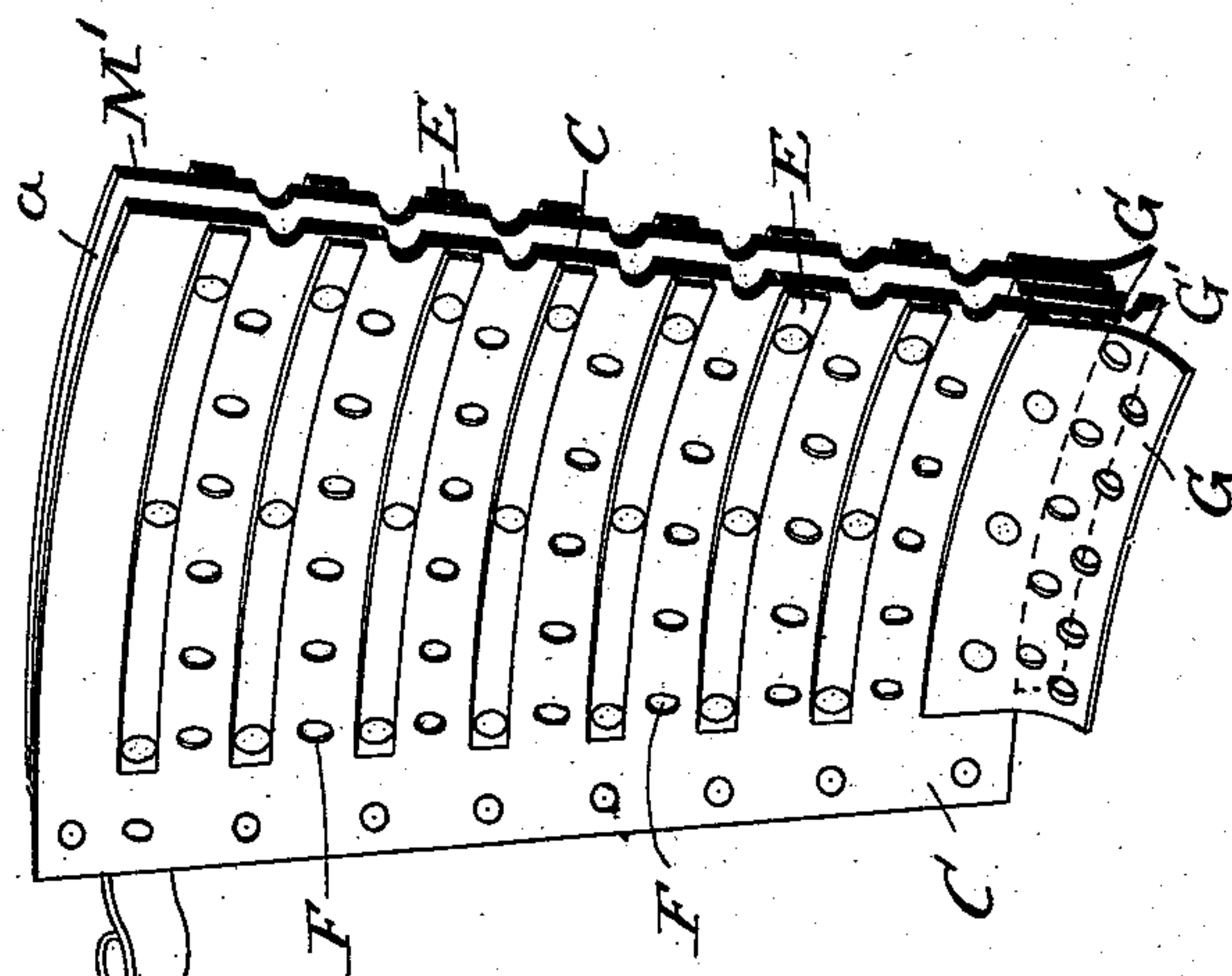


Fig. 6.

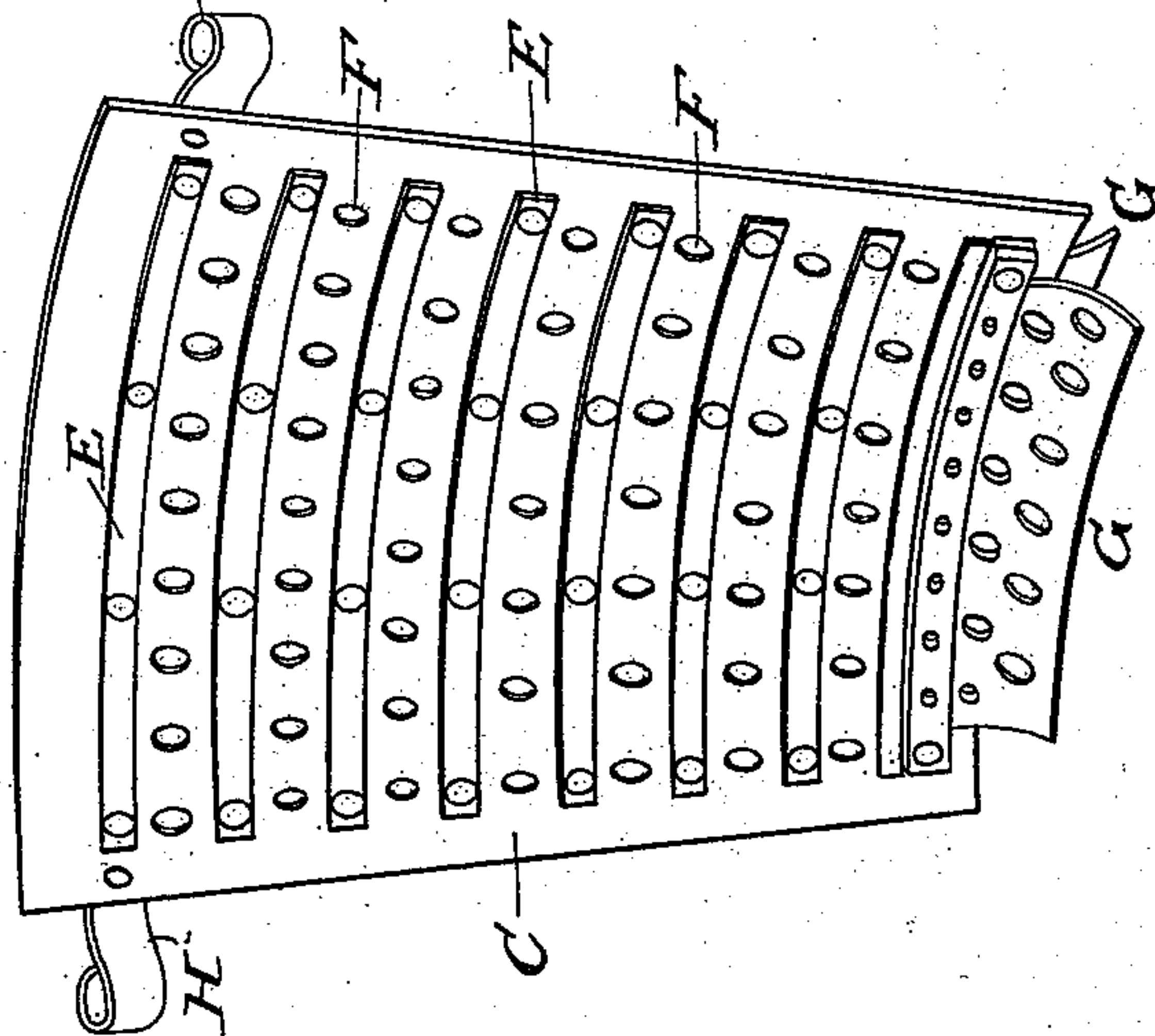


Fig. 5.

Witnesses:
Lloyd B. Knight.
Ally Scott.

Inventors.
GEORGE ABRAHAM GOODWIN,
WILLIAM FIELD HOW,
By their Attorney. *R. L. Ewin.*

UNITED STATES PATENT OFFICE.

GEORGE A. GOODWIN AND WILLIAM FIELD HOW, OF LONDON, ENGLAND.

FOUNDRY-LADLE.

SPECIFICATION forming part of Letters Patent No. 377,747, dated February 14, 1888.

Application filed September 21, 1886. Serial No. 214,186. (No model.) Patented in England February 8, 1886, No. 1,827; in France September 27, 1886, No. 178,744, and in Canada October 9, 1886, No. 25,092.

To all whom it may concern:

Be it known that we, GEORGE ABRAHAM GOODWIN and WILLIAM FIELD HOW, both of London, England, engineers, have invented an Improvement in Foundry-Ladles, of which the following is a specification.

Our invention relates to ladles such as are used in foundries for pouring molten metal for the production of castings, and particularly to that construction of such ladles whereby the metal may be poured from the top, but drawn, free from scoria or other dross, from the bottom of the ladle, (patented to us in Great Britain and Ireland by Letters Patent No. 1,827, dated February 8, 1886; in Canada by Letters Patent No. 25,092, dated October 9, 1886, and in France, No. 178,744, dated September 27, 1886.)

Our present invention consists, primarily, in a peculiar construction of the scoria stopper or partition, as hereinafter described and claimed, with reference to insuring the perfect adhesion of the refractory coating to both sides thereof.

It consists, secondly, in a peculiar construction of the lower edge of the same, which is subjected to the greatest strain and wear, whereby the coating of refractory material is afforded additional support at this point.

Our invention consists, thirdly, in a novel combination of parts, whereby the partition is rendered easily removable, to facilitate repairs, relining, or cleaning, and is held in place by devices removed from contact with the molten metal.

Two sheets of drawings accompany this specification as part thereof.

Figures 1 and 2 of the drawings are respectively a vertical section and a plan view of an improved foundry-ladle illustrating this invention. Figs. 3 and 4 are like views of a modified foundry-ladle, illustrating the same invention in part, Fig. 4 being partly in section. Figs. 5, 6, and 7 are detail views in perspective, Figs. 6 and 7 being also partly in section, illustrating, respectively, the construction of the removable partition shown at C in Figs. 1 and 2, an alternative construction of the same, and the means whereby it is held in place.

Like letters refer to like parts in all the figures.

To carry out our invention, we may permanently unite the shell of the ladle A and the outer wall, B, of the spout, Figs. 1 and 2, and then insert a curved partition, C, projecting above the top of the ladle, and which is made to slide in guides D, Fig. 7, attached to the sides of the ladle-shell. This partition C divides the body of the ladle from the spout. It does not descend to the bottom of the ladle, but leaves a suitable orifice or exit for the molten metal at the bottom of the spout. This removable partition may be conveniently rendered double by means of a bent plate, M', Fig. 6, forming an air-chamber, *a*, for extra durability; or the partition may be of a single sheet, as shown in Figs. 1 and 2 and in Figs. 5 and 7, but in each case is prepared with horizontal strips E and with perforations F, while on each side, at the bottom, are attached projecting wings G, perforated with holes, so as to retain the fire-clay covering or other refractory material, with which it is coated like the interior of the ladle and spout. This partition C may be provided at each of its upper edges with an eye, H, or have eye-lugs bolted on, which are allowed to drop over pins K, attached to the framing of the ladle, so that it may be conveniently secured in position, as shown in Figs. 1 and 2 and in dotted lines in Fig. 7.

The above-described shutter or partition C is easily withdrawn at any time, thus facilitating repairs or replacement or cleaning when required. This arrangement further provides a most handy and convenient pouring-spout for concentrating the flow and maintaining a large body of metal at the exit.

Within the spout B, near its intersections with the partition C, we attach angle-irons I, which so support the refractory lining as to confine the passage for the molten metal to the central portion of the spout, or, in other words, to free the passage from contracted portions. We may produce the same construction by alteration from any ordinary ladle, thus: We remove or cut out the portion of the wall of the ladle toward the part at which the spout is to be formed, and then attach perma-

nently, as by riveting, the projecting spout B and floor B', Fig. 3. We then fit the sliding partition C in the guides D, and with its faces prepared for the better adhesion of the refractory lining, as heretofore described.

We may also adapt an ordinary ladle to our purpose in a cheaper and slightly modified but equivalent manner, as in Figs. 3 and 4, thus: We cut a hole, L, through the side of the ladle A close to the bottom, of such suitable dimensions, according to the size of the ladle, as will permit of an easy flow. Upon the outside of the ladle where this orifice is cut we attach a spout, B, and spout-floor B', as shown in Figs. 3 and 4, said spout extending from the bottom to the top of the ladle; and on the outside of the original wall of the ladle, now forming the partition C between the body and the spout, we attach a plate, M, projecting above the top of the ladle, to prevent the wash of the slag or dross. Said plate M conveniently forms an air-space, *a*, as before described, and, together with the underlying portion of the partition proper, C, is provided with horizontal strips E and perforations F, such as before described, while at the lower edge of said plate M and partition C perforated wings G, as before described, are attached to protect the coating at the lower edge of the completed partition. A spacing-strip, G', Fig. 3, between said plate and partition at their lower edges, may form a supplemental edge-guard. The united spout and spout-floor may be attached by means of bolts N, tapped into the ladle-body A, or otherwise removably attached to the body of the ladle, the partition being fixed. The interior of the spout and the exterior of said plate M, together with the lower edge of the partition, are coated with the refractory lining O before attaching the

The double removable partition, (repre-

sented by Fig. 6,) so far as it has not already been described, is substantially identical in structure with the double fixed partition just described, as represented in Figs. 3 and 4.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a foundry-ladle having a projecting trough-spout, a scoria stopper or partition having a metallic frame coated on both sides with refractory material, such as fire-clay, and constructed of a curved shape in horizontal section, and provided with horizontal strips on both sides and with holes between such strips, whereby the adhesion of its coating is insured, substantially as hereinbefore specified.

2. In a foundry-ladle having a projecting trough-spout, a scoria stopper or partition having a metallic frame coated on both sides with refractory material and provided at its lower edge with perforated wings G, to protect the coating at the top of the throat between the ladle-body and spout, substantially as hereinbefore specified.

3. The combination of a ladle body, A, having a fixed projecting trough-spout, B, extending from bottom to top, and provided with guides and cotter-pins, and a scoria stopper or partition, C, which slides in said guides, and is provided with strips and holes and with eyes which embrace said cotter-pins, whereby it is rendered removable, in the manner set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE A. GOODWIN.
WILLIAM FIELD HOW.

Witnesses:

JOHN C. FELL,
SAM. P. WILDING.