

No. 722,770.

PATENTED MAR. 17, 1903.

F. W. TAYLOR & H. L. GANTT.
PYROMETER.

APPLICATION FILED AUG. 13, 1900.

NO MODEL.

FIG. 1.

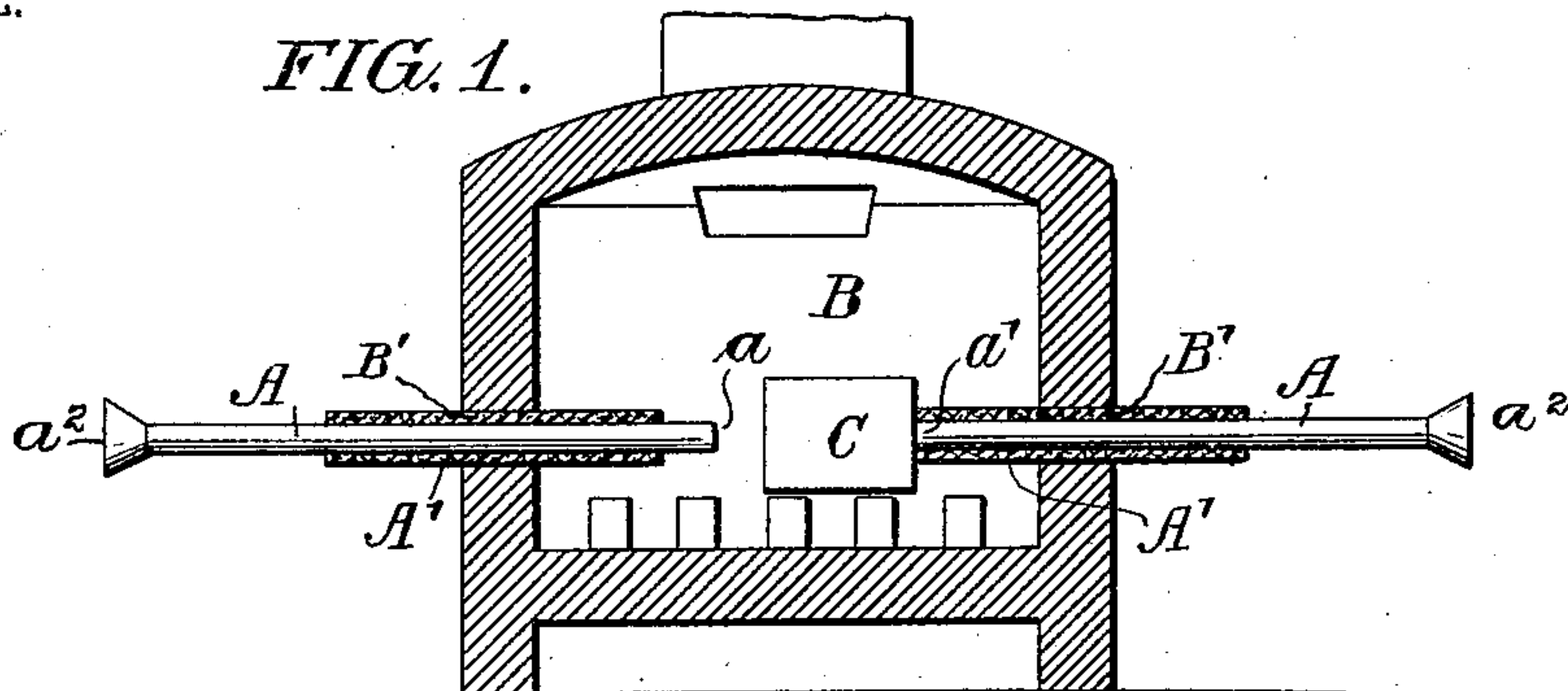


FIG. 5.

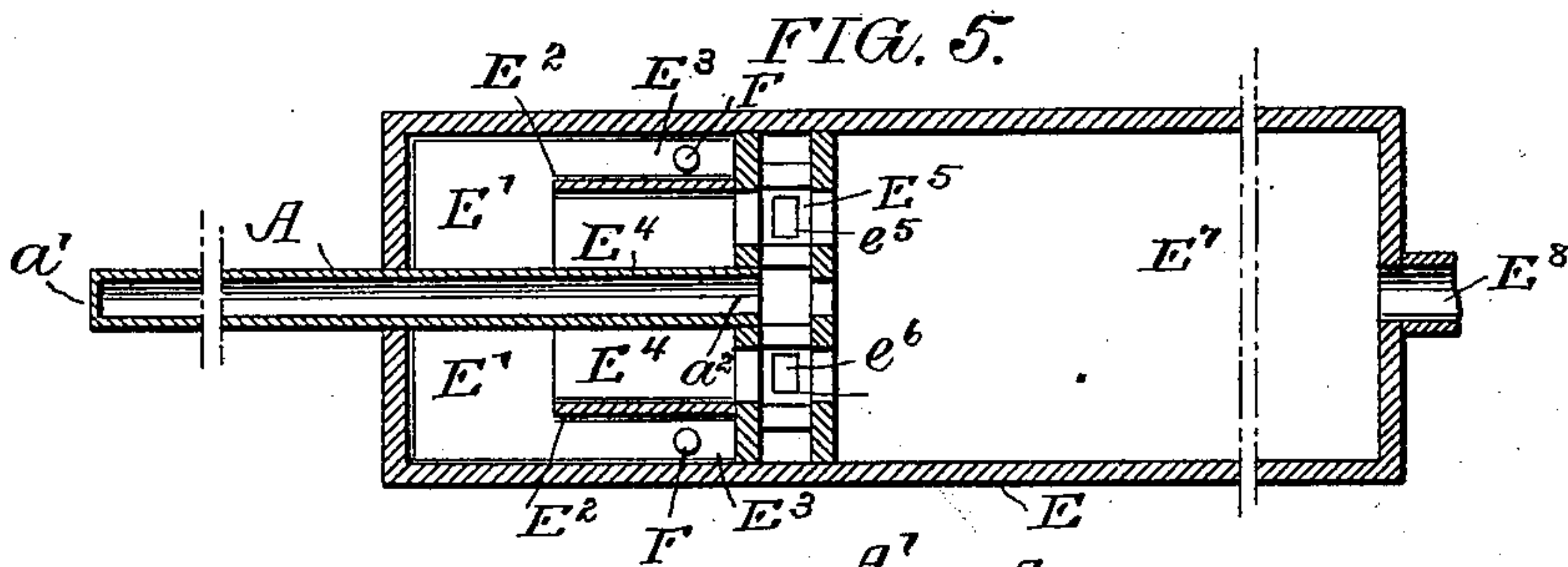


FIG. 3.

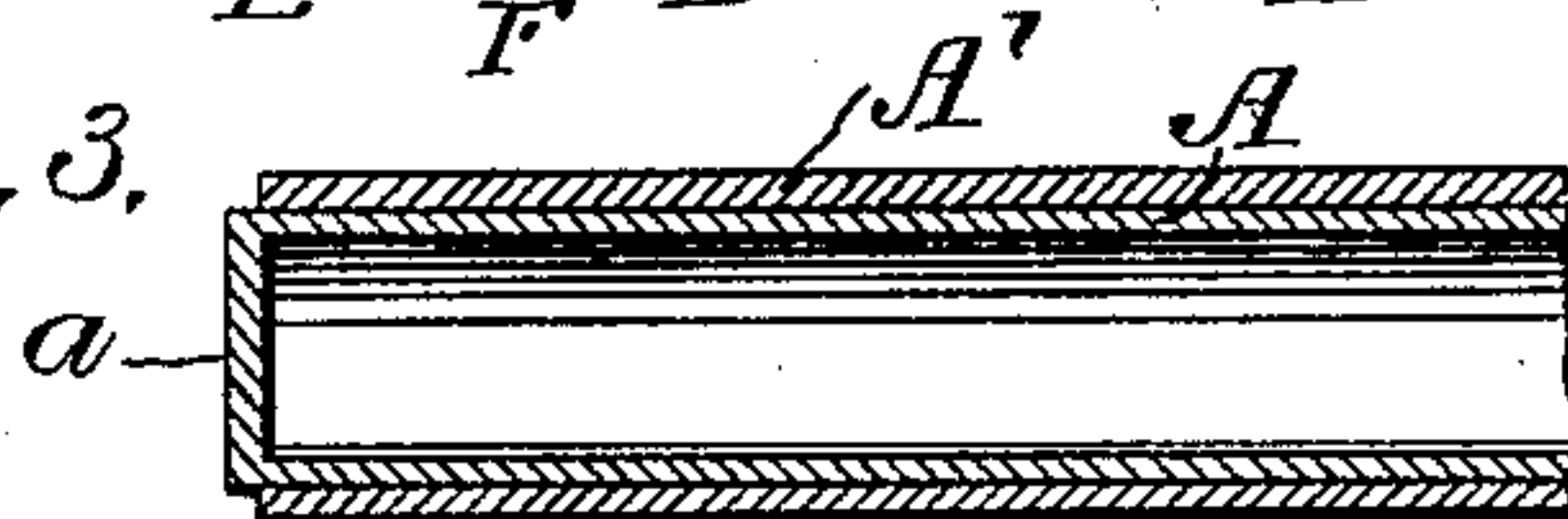


FIG. 4.

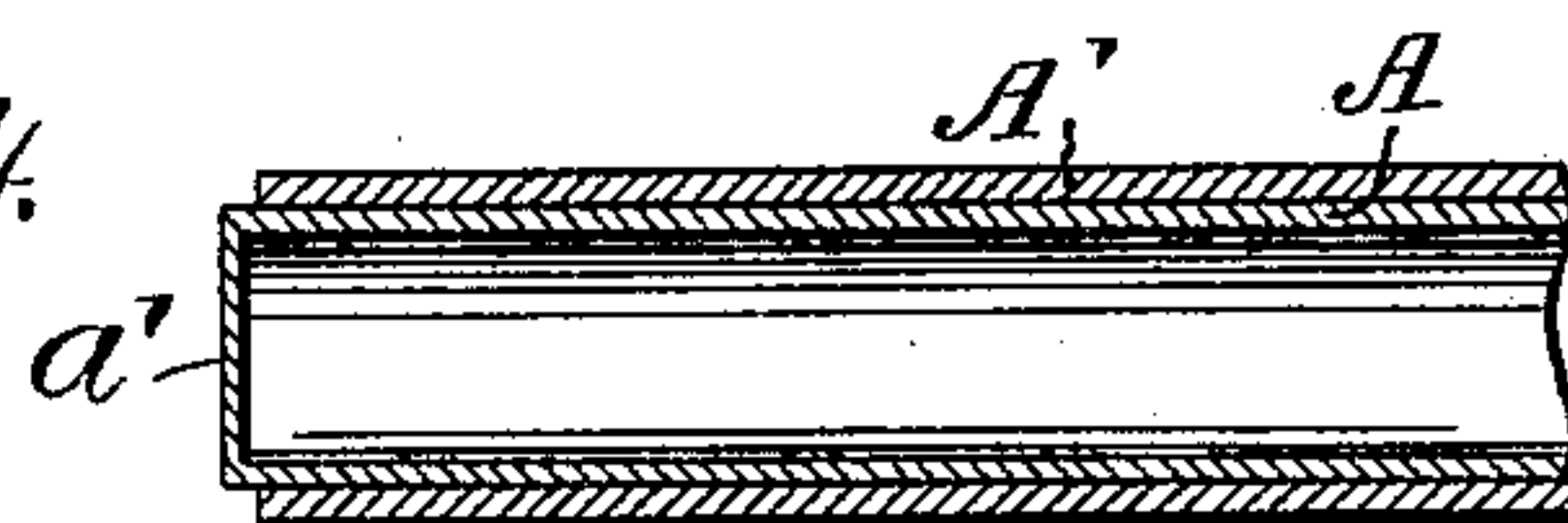
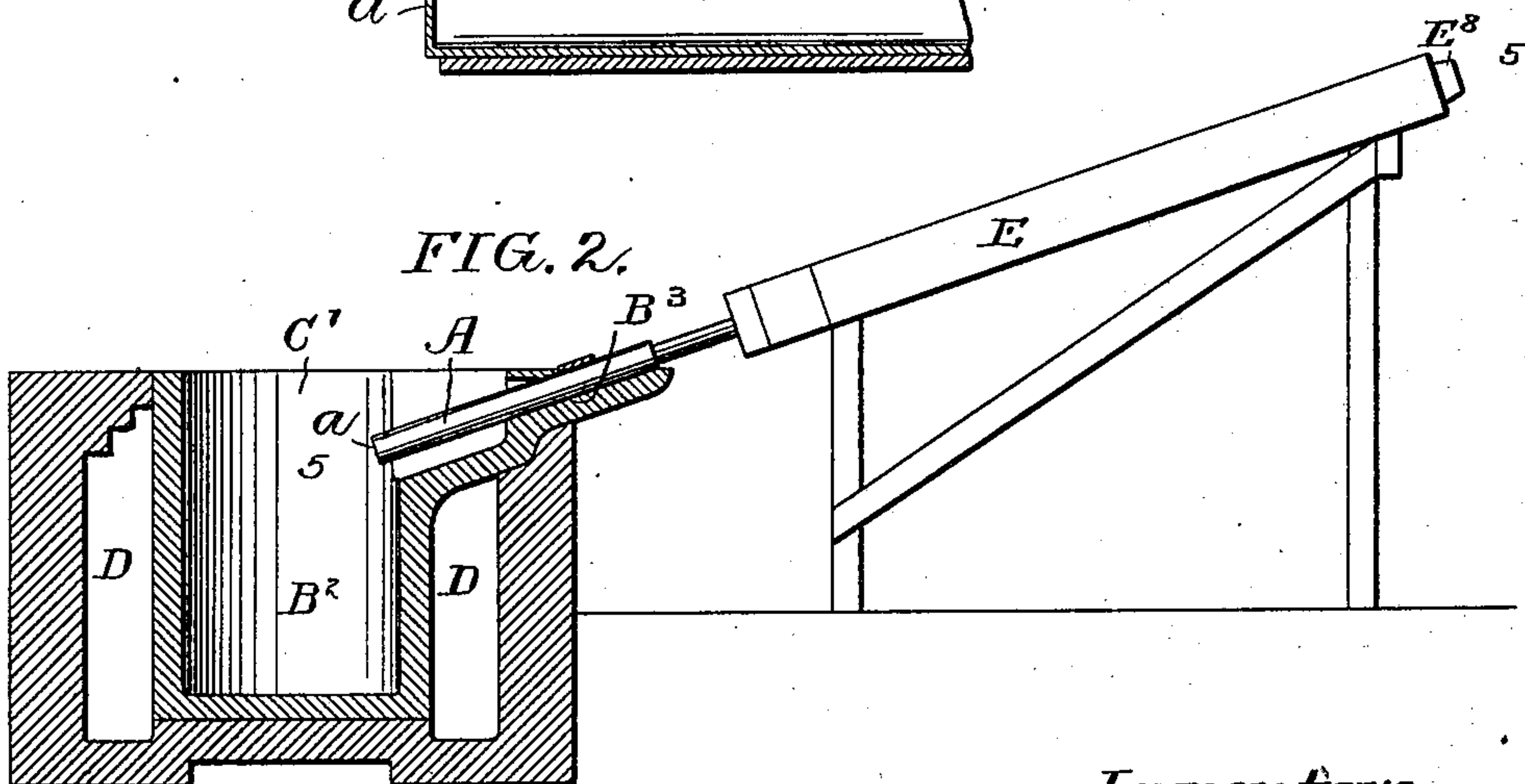


FIG. 2.



Witnesses:

G. W. Goodwin
H. W. Gantt

Inventors:

Frank W. Taylor
Henry L. Gantt
by their atty.
Frank T. Chambers

UNITED STATES PATENT OFFICE.

FREDERICK W. TAYLOR AND HENRY L. GANTT, OF SOUTH BETHLEHEM, PENNSYLVANIA, ASSIGNORS TO THE BETHLEHEM STEEL COMPANY, OF SOUTH BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PYROMETER.

SPECIFICATION forming part of Letters Patent No. 722,770, dated March 17, 1903.

Application filed August 13, 1900. Serial No. 26,740. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK W. TAYLOR and HENRY L. GANTT, citizens of the United States of America, residing in South Bethlehem, in the county of Northampton, in the State of Pennsylvania, have invented certain new and useful Improvements in Pyrometers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

Our invention relates to means for ascertaining the temperature of highly-heated receptacles or of heated objects contained in such receptacles, our object being to provide a simple and highly-efficient device for this purpose; and our invention consists in combining with a furnace or other highly-heated receptacle a tube having a closed end situated within the receptacle and exposed to the temperature thereof and an open end situated without the receptacle and through which the light intensity and color radiated from the heated end of the tube can be observed and the temperature of the said heated end and of the receptacle in which it is situated thereby determined. In cases where a considerable length of the tube is exposed to the high heat we prefer to protect the tube from a point close to the closed end and through such part of the tube as is exposed to the high heat by means of a non-conducting jacket or covering. We prefer also to use the closed-ended tube in connection with and as a part of a pyrometer constructed so as to provide adjacent to the open end of the tube a light of standard color and intensity with which to compare the light issuing from the tube; but this combination of the closed-ended tube and the pyrometer forms in part the subject-matter of our pending application for Letters Patent filed October 23, 1899, Serial No. 734,456, and is not therefore claimed herein.

Reference being now had to the drawings in which our invention is illustrated, Figure 1 is a cross-sectional view through a furnace having in combination with it our closed-ended tubes, two means of using the tube being illustrated. Fig. 2 is a sectional elevation of

a lead-pot, showing our closed-ended tube in combination with it and also a pyrometer connected with the tube. Fig. 3 is a sectional view of the closed end of the tube; Fig. 4, a similar view showing, however, the end closed by a thinner plate. Fig. 5 is a section through the pyrometer indicated in Fig. 2.

A indicates the tube, a indicating its closed end, with the thickness of metal substantially that of the sides of the tube, while a' indicates the end closed by a thinner plate of metal.

a^2 indicates the open end of the tube, which may be enlarged to admit the face of an observer, as indicated in Fig. 1.

A' indicates the non-conducting jacket of the closed-ended tube.

B, Fig. 1, indicates a furnace in which is shown at C what may be taken for an ingot of metal.

B' B' are openings through the wall of the furnace through which the closed-ended tubes extend.

B², Fig. 2, indicates a lead-pot formed with a spout-like extension B³, upon which the closed-ended tube A is supported.

C' indicates the level of the melted lead with which the pot is filled, the lead-pot being shown as surrounded by a heating-flue D.

E indicates the pyrometer, which, as illustrated, is constructed in accordance with that forming the subject-matter of our before-mentioned prior application, the tube A entering the end of the pyrometer between two chambers E' E', the forward ends of which are divided by partitions E² into chambers E³ and E⁴, both opening into the full chamber E' at the rear.

F F indicate lamps situated in the chambers E³, the light from which is radiated backward into the chambers E⁴ and through color-screens situated in chambers E⁵ and E⁶ and indicated at e^5 e^6 .

E⁷ indicates a light-excluding box extending from the chambers containing the color-screens to an eyepiece, (indicated at E⁸.)

In using our device the operator simply looks through the open end of the tube, which is situated at a point where it is not unduly

hot, and observing the color and intensity of the light given off from the heated closed end of the tube the trained observer is liable to approximate with great accuracy to the degree of temperature in the receptacle the heat of which is shared by the closed end of the tube. His observation is of course materially aided by having under observation not only the light from the closed end of the tube, but a standard light corresponding to a known temperature, and this is most conveniently provided by such a pyrometer as is indicated in Fig. 5, the colored screens $e^5 e^6$ being preferably arranged to emit light corresponding in each case to a somewhat-different temperature, so that the observer may have a double standard of comparison.

It is sometimes desirable that the temperature of an ingot or other object being heated should be observed rather than the temperature of the heating-chamber, and this is conveniently provided for by moving the closed end of the tube into contact with the ingot, as shown in Fig. 1, for this purpose a tube having a thin closed end, as indicated at a' , being preferable.

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

1. As a means of ascertaining the temperature of highly-heated receptacles, the combination with a furnace or other heated receptacle, of a straight tube having a closed end situated within the receptacle and exposed to the heat thereof, and an open end situated outside of the receptacle and through which the color and light intensity of the light-rays directly radiated from the closed end to the open end can be observed.

2. As a means of ascertaining the temperature of highly-heated receptacles, the combination with a furnace or other heated receptacle of a tube having a closed end situated within the receptacle and exposed to the heat thereof, an open end situated outside of the receptacle and through which the color and light intensity of the closed end can be observed, and a non-conducting covering for the tube extending from a point close to the closed end over the portion of the body of the tube which is exposed to the high heat of the receptacle.

FREDERICK W. TAYLOR.
HENRY L. GANTT.

Witnesses:

DAVID C. FENNER,
CARL G. BARTH,
CARL GEORGE LANGE BARTH.