

(No Model.)

B. F. RADFORD.  
DIGESTER.

No. 483,942.

Patented Oct. 4, 1892.

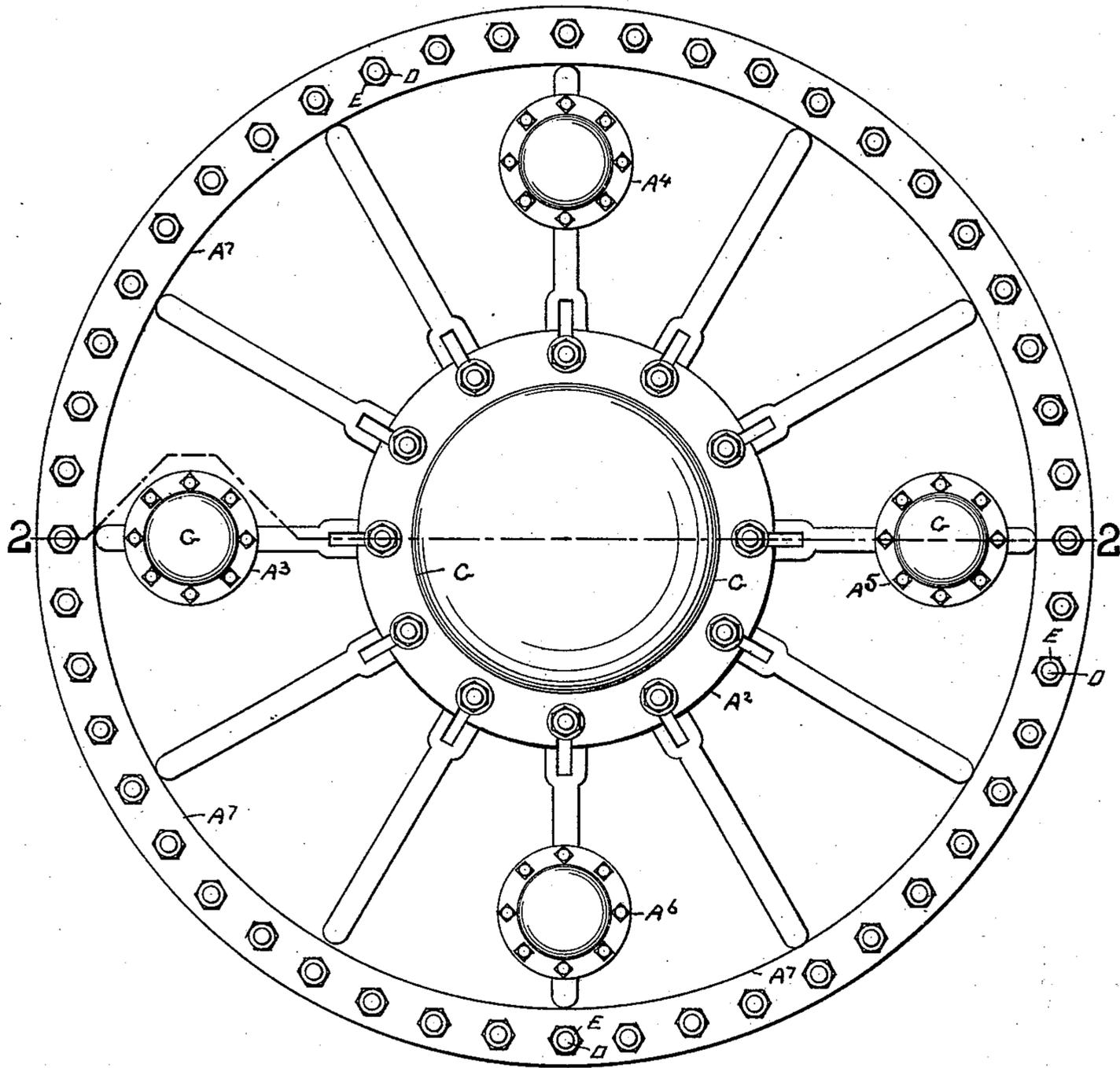


FIG. 1

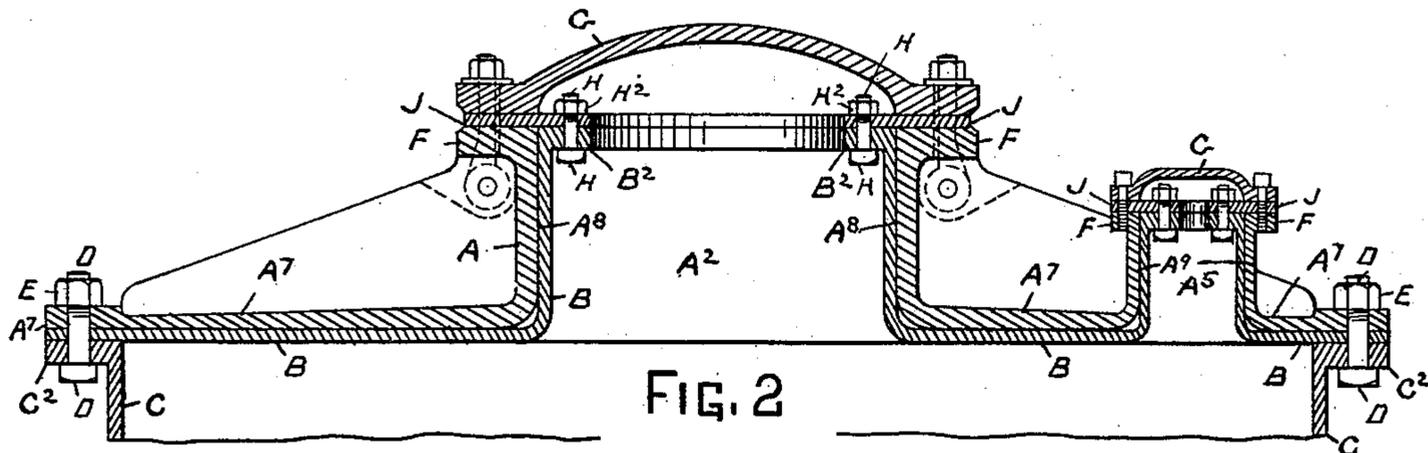


FIG. 2

WITNESSES

Marion E. Brown.  
Frances M. Brown.

INVENTOR

Benjamin F. Radford  
by his Attorneys  
Brown Brothers

# UNITED STATES PATENT OFFICE.

BENJAMIN F. RADFORD, OF HYDE PARK, MASSACHUSETTS.

## DIGESTER.

SPECIFICATION forming part of Letters Patent No. 483,942, dated October 4, 1892.

Application filed June 15, 1891. Serial No. 396,375. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. RADFORD, a citizen of the United States of America, and a resident of the town of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Digesters, of which the following is a full, clear, and exact description.

This invention relates to digesters to be used more especially in the manufacture of sulphite-pulp, and particularly to the domes of the digesters, which heretofore in some instances, and preferably, have been made of solid bronze metal.

The object of this invention is to produce these domes in each and every respect practically equal to the domes of solid bronze metal and in a manner requiring comparatively but a small quantity of bronze metal, thereby materially reducing their cost of manufacture.

The dome of this invention, in substance, is constructed of the combination of two separate layers of metal—to wit, an outer layer of iron or other such like metal and an inner layer of bronze or other such like metal. The outer iron layer, preferably in one piece, as usual, has upwardly-extending man and inlet holes, each provided with an outward horizontal flange, and at its rim it sets upon an outward horizontal flange at one end of the digester-body. The inner bronze layer, preferably in one piece, is shaped to closely lie against and line the whole inner surface of the iron outer layer, including its said rim and the inner surfaces of the side walls of its man and inlet holes, and at the outer end of each of said holes preferably it has a horizontal inwardly-projecting flange. An inner bronze layer and an outer iron layer, shaped and fitted together as has been stated, constitute the dome of this invention, and it is secured to the digester-body by means of screw-bolts and screw-nuts, as well known. Again, under this invention, in substance, the inner bronze layer at its portions lining the man and inlet holes is held in position against the walls of said holes by means of the covers of said holes and screw-bolts and screw-nuts or such like applied to said covers and to said outward flanges of said holes, in combination with a ring of metal, preferably of bronze, for each of said holes,

and which lies between the cover and the outward flange of the hole and also upon said inward flange of the inner bronze layer, and means—such as headed screw-bolts and screw-nuts—applied to said flanges of the inner bronze layer and said rings.

In the drawings forming part of this specification, Figure 1 is a plan view of the digester-dome of this invention. Fig. 2 is a central vertical section on line 2 2, Fig. 1.

In the drawings, A is the iron or outer layer and B is the bronze or inner layer of the dome, and each layer preferably is in one piece. The iron outer layer A is shaped as usual and has an upwardly-projecting manhole A<sup>2</sup>, inlet-holes A<sup>3</sup> A<sup>4</sup> A<sup>5</sup> A<sup>6</sup>, respectively, and a rim A<sup>7</sup>, which is suitable to set upon the upper face of an outward horizontal flange C<sup>2</sup>, surrounding the open end of the digester-body C, and to which end the dome is to be attached by any suitable means—as, for instance, as well known, by headed screw-bolts D and screw-nuts E. Again, each man and inlet hole of the iron outer layer of the dome at its outer end is surrounded by a horizontally-projecting flange F, and to these flanges the respective covers G for the man and inlet holes are attached, each by suitable means, and all as well known—as, for instance, by headed screw-bolts and screw-nuts.

The bronze inner layer B is shaped to closely lie against and thereby to line the whole inner surface of the iron outer layer A, including its rim A<sup>7</sup> and also the vertical inner wall A<sup>8</sup> of its manhole A<sup>2</sup> and the vertical inner wall A<sup>9</sup> of each of its inlet-holes. Furthermore, within said holes and at their outer end the bronze inner layer B of each has a horizontal inward-projecting flange B<sup>2</sup>, each covered by a ring J of metal, preferably bronze, and of suitable width otherwise to cover the outward flange F of each of said holes, all so that by the attachment of the covers of said holes, as has been described, said rings are secured on the dome, it being understood that previous thereto they were secured to said flanges of the bronze inner layer of the dome by means, such as headed screw-bolts H and screw-nuts H<sup>2</sup>, properly applied to said rings and said flanges, as shown.

From the above description it is plain that a digester-dome is produced having an iron

outer layer and a bronze inner layer and in a manner and combination such that the dome is in every substantial respect practically equal to one made of solid bronze and the expense of the manufacture of which is greatly reduced, for the reason that, as compared with that of a dome of solid bronze, the amount of bronze necessary is reduced to the minimum.

Although this invention has been particularly described as to be used for sulphite-pulp, it is not intended to limit it to that use, as it may be used for other purposes where bronze or other expensive metals are necessary to resist the action of acids.

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

A dome or head for digesters, composed of

an outer layer of iron and an inner layer of bronze, adapted to closely fit each other, and having openings or holes leading there-through, an inward circumferential flange of bronze at said openings, an outward circumferential flange of iron at said openings, a metal ring covering both of said flanges and secured to the bronze flange, and a cover seated on said ring and it and the ring secured to the iron flange, substantially as described, for the purposes specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BENJ. F. RADFORD.

Witnesses:

ALBERT W. BROWN,  
MARION E. BROWN.