

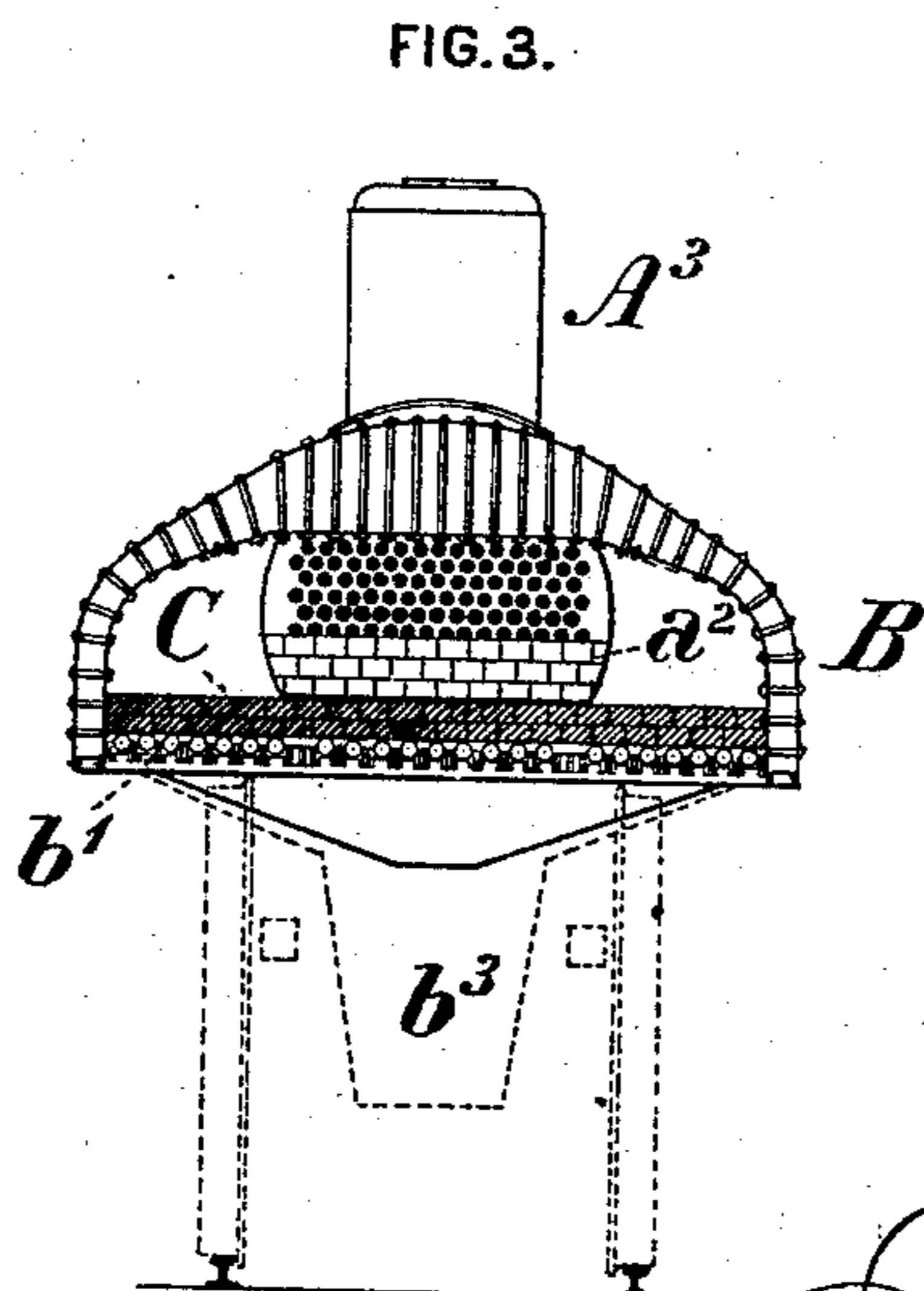
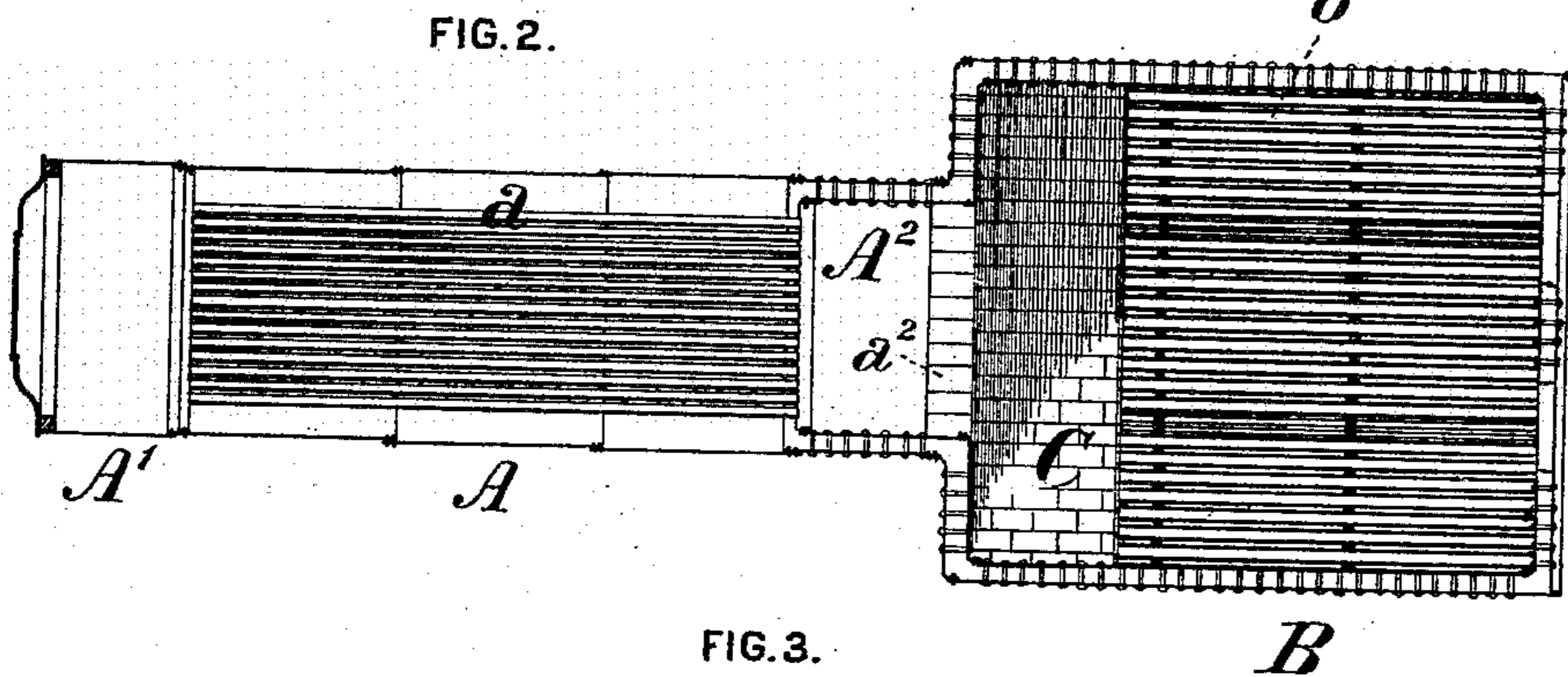
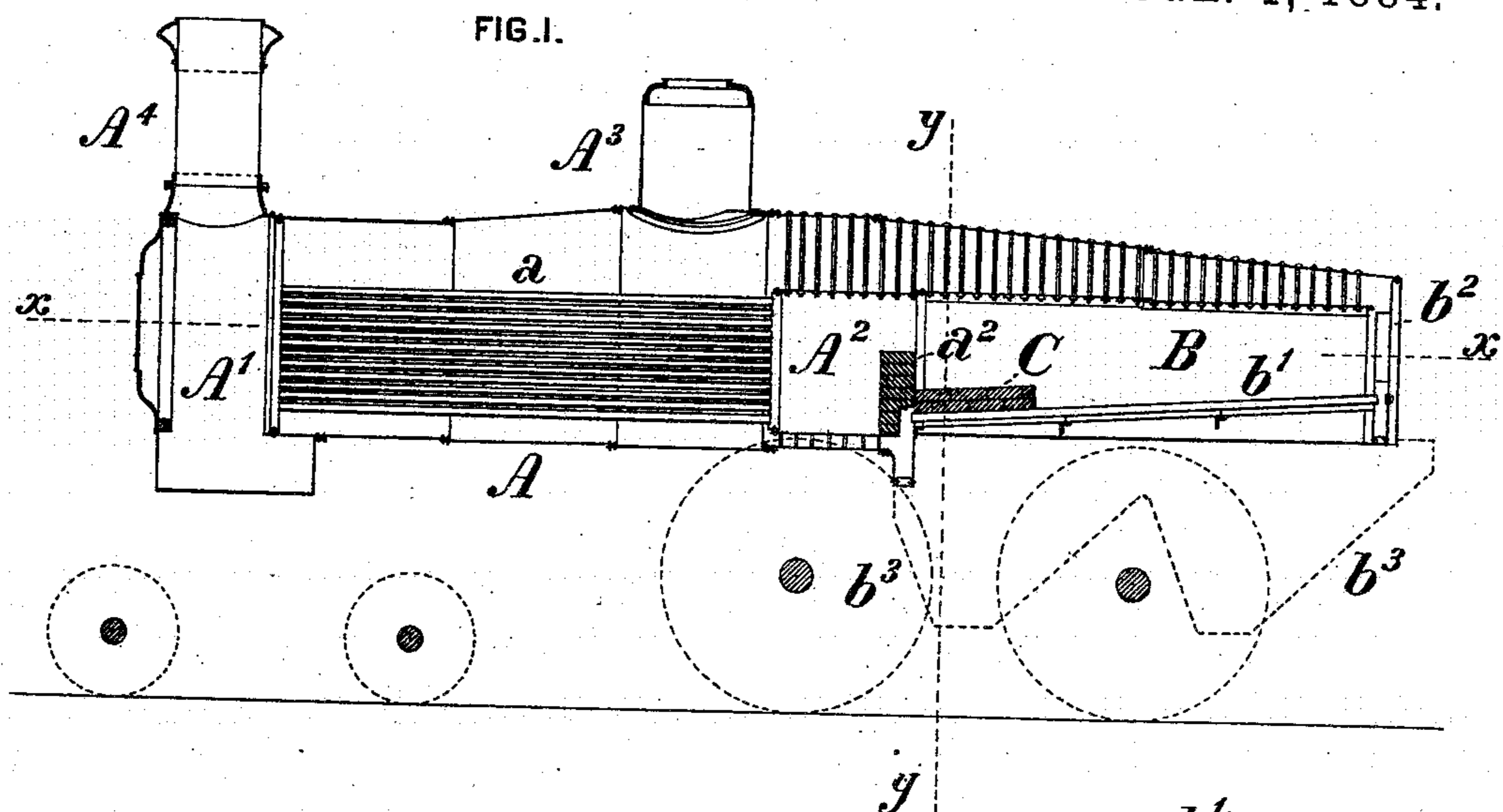
(No Model.)

J. E. WOOTTEN.

LOCOMOTIVE BOILER.

No. 291,120.

Patented Jan. 1, 1884.



WITNESSES:

Geo. B. Collier.
Jas. M. Landis.

INVENTOR.

John E. Wootten,
by Collier & Bell,
attys.

UNITED STATES PATENT OFFICE.

JOHN E. WOOTTEN, OF PHILADELPHIA, PENNSYLVANIA.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 291,120, dated January 1, 1884.

Application filed August 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WOOTTEN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Locomotive-Boilers, of which improvements the following is a specification.

My improvements more particularly relate to locomotive-boilers of the class in which a material increase of grate area and fire-box heating-surface is attained relatively to the ordinary construction by the provision of a fire-box, which is located above and extended laterally beyond the driving-wheels, and which is combined with a combustion-chamber and a fire-bridge interposed between the combustion-chamber and the fire-box. Said features are fully exemplified in Letters Patent of the United States Nos. 192,725 and 254,581, granted and issued to me under dates of July 3, 1877, and March 7, 1882, respectively.

The object of my present invention is to afford improved facilities for the effective and economical combustion of lignite and other fuels, (such as bituminous coals of various descriptions,) which are analogous thereto in the particular of readily permitting the separation of small and light particles from the larger masses or fragments in which they are delivered for consumption, when burned under a forced blast, even though the latter may be comparatively mild in degree.

To this end my improvements consist in a table or repository located at the forward end of a fire-box and extending transversely to the same, the upper surface of said table being located above the end of the grate, the rear end of the table being closed between its upper surface and the level of the grate, and said table being adapted to receive and sustain light particles of fuel that may be lifted from the mass upon the grate by the action of the draft; also, in a table or repository located on and supported by the forward portion of the fire-grate of a locomotive-boiler; also, in a table or repository composed of one or a series of sections of fire-brick, tile, or other sufficiently refractory material, built into the forward portion of the fire-box of a locomotive-boiler, and supported by the grate thereof; also, in the combination of a laterally-extended fire-box, a fire-bridge, and a transverse table or reposi-

tory extending rearwardly from said fire-bridge across the fire-box.

The improvements claimed are hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a vertical longitudinal central section through a locomotive-boiler embodying my invention; Fig. 2, a horizontal longitudinal section through the same at the line *xx* of Fig. 1, and Fig. 3 a vertical transverse section at the line *yy* of Fig. 1.

My improvements are herein illustrated and will be described as applied in a locomotive-boiler similar to that of my Letters Patent No. 254,581, aforesaid. The waist or barrel *A* of the boiler is fitted with a series of fire-tubes, *a*, extending from the smoke-box *A'* to a combustion-chamber, *A²*, formed in the end of the waist adjacent to and communicating with the fire-box *B*, and a fire-bridge, *a²*, extends across the lower portion of the combustion-chamber, separating the same from the fire-box. A dome, *A³*, is placed upon the waist in any convenient position, and carries the safety-valves, whistle, and other ordinary attachments. The cab can be conveniently located about midway of the length of the boiler or otherwise, if desired, and the smoke-box *A'* is provided with a stack, *A⁴*, of any preferred construction. The fire-box *B* is located entirely above the driving-wheels, and is extended laterally beyond the driving-wheels to any desired extent within the greatest width admissible for passage over the road. It is, as usual, furnished with a proper grate, *b'*, furnace-doors *b²*, and ash-pans *b³*, the latter suitably arranged relatively to the engine-frame and driving-axles.

Under my present invention, I provide a table or repository, *C*, which may be either horizontal or inclined in or about in correspondence with the inclination of the fire-grate *b'*, and which extends across the fire-box *B* immediately in rear of the fire-bridge *a²*, above the surface of and preferably supported upon the forward portion of the fire-grate, and having its rear end closed between its top and the level of the grate, said table or repository thus presenting upon its upper side a substantially imperforate surface, which is adapted to receive and sustain particles of the fuel which may from time to time be lifted by the action of the exhaust from the mass of fuel in combustion

upon the grates, as well as to serve as the lower boundary of a space within the fire-box, which fulfills in a great measure the function of a combustion-chamber for the gases. The tendency of such separated particles of fuel to be carried over the fire-bridge and into the combustion-chamber A² and tubes, which ordinarily obtains, is, by the provision of the table C, substantially nullified, and such particles, after yielding the heat due to their combustible elements, remain upon the table, and may be removed therefrom at pleasure or convenience. It will be obvious that it is not designed nor desirable that fuel should be fired upon the table C; but if any portion of the fuel be accidentally projected on the table, its function will not thereby be interfered with. The height of the table above the surface of the grate should be sufficient to obviate such tendency for fuel to be thrown upon it with proper firing, and in practice its upper surface is located above the surface of the grate at or about the ordinary level of the bed of fuel carried thereon. In the instance shown the table C rests and is supported directly on the top of the grate, which, for simplicity and convenience and economy of construction, I deem more desirable than supporting it separately therefrom. The latter plan may, however, be adopted, if preferred, it being essential in such case that no opening should be permitted to exist at its rear end between its lower side and the top of the grate. The table C is by preference formed of a tile or a series of bricks, tiles, or sections of fire-clay or other sufficiently refractory material, which may be built into the front end of the fire-box, so as to form a continuous body therein, extending from the back of the fire-bridge over a greater or less portion of the area of the grate, as regulated by the characteristics of the particular fuel employed.

It has been found in practice, with engines having an area of fire-box on line of grate of about seventy-six square feet, that with some fuels a table covering ten percent. of the length of the grate is efficient, whereas with other fuels a table has been employed covering as much as twenty-five per cent. of the length of the grate. It may, however, with certain fuels or

under certain conditions of service, be found advisable to extend the table over a greater fraction of the length of the grate than that last mentioned.

A table constructed and supported as before set forth is of comparatively slight cost, and can be readily and expeditiously inserted, repaired, or removed whenever required.

The application of my improvements is inexpensive, as it involves no changes in the fire-box proper, and their practice with fuels of the description hereinbefore referred to has been characterized by entire freedom in steaming without undue labor in firing, and with a material reduction of the emission of smoke and light cinders from the stack.

I claim as my invention and desire to secure by Letters Patent—

1. A table or repository located transversely to the fire-box of a locomotive-boiler at the front end, and covering the forward portion of the grate thereof, the rear end of said table being closed from its top to the surface of the grate, and its upper surface being located above the surface of the grate at or about the ordinary level of the bed of fuel thereon; substantially as set forth.

2. A table or repository located on and supported by the forward portion of the grate of a locomotive-boiler, its upper surface being located above the surface of the grate at or about the ordinary level of the bed of fuel thereon, substantially as set forth.

3. A table or repository constructed substantially as described, composed of one or a series of tiles, bricks, or sections of refractory material, built into the forward portion of the fire-box of a locomotive-boiler, and supported by the grate thereof, substantially as set forth.

4. The combination, in a locomotive-boiler, of a laterally-extended fire-box, a fire-bridge, and a table or repository extending rearwardly from said fire-bridge and across the fire-box, substantially as and for the purpose set forth.

JOHN E. WOOTTEN.

Witnesses:

J. SNOWDEN BELL,
JAMES M. LANDIS.