(No Model.) 2 Sheets—Sheet 1.

D. DOUGHERTY.

STEAM GENERATOR.

No. 405,954. Patented June 25, 1889.

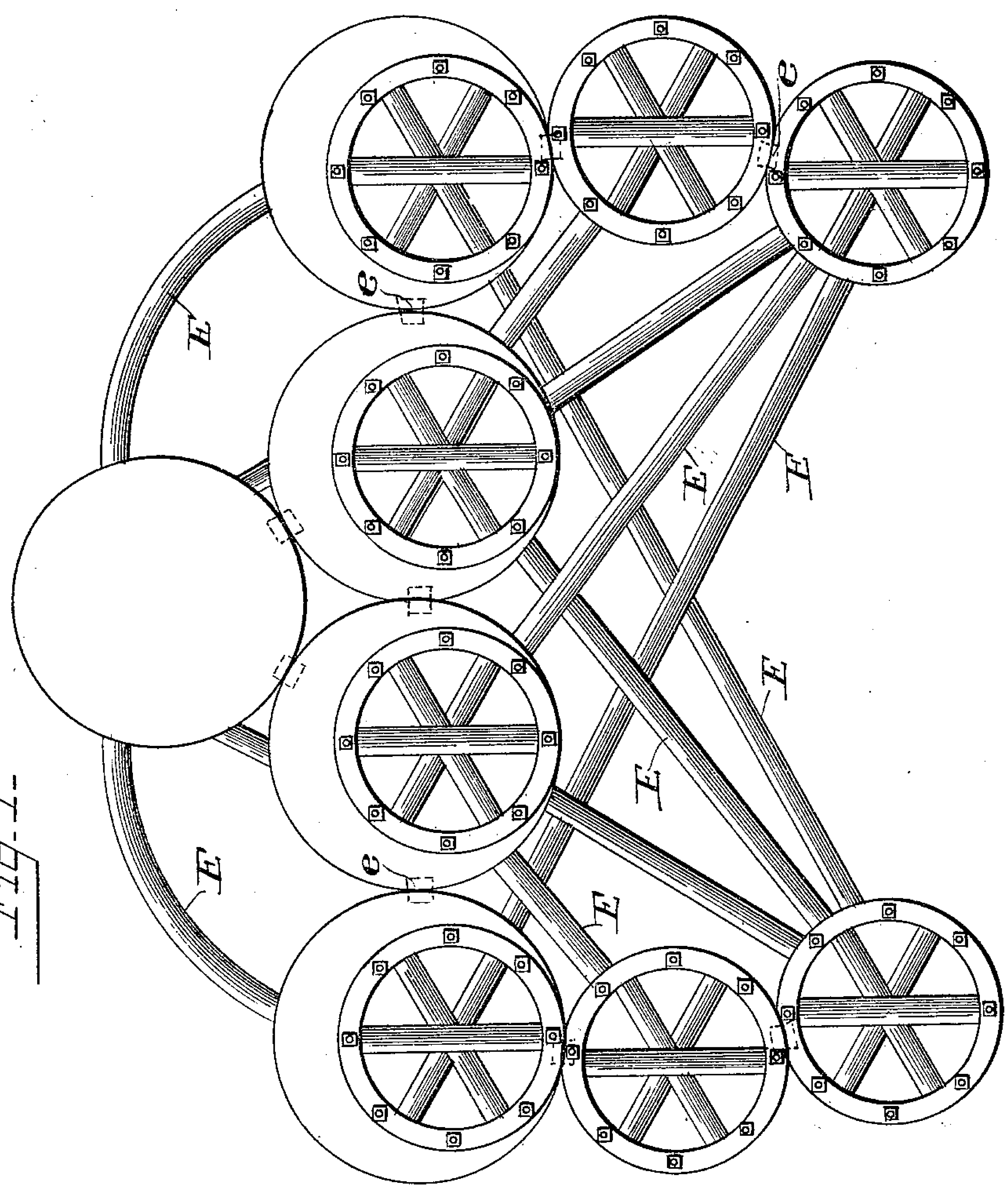

Fig. 1.

Witnesses

G. W. Taubenschmidt,

J. McNamee.

Inventor

Daniel Dougherty

By his Attorney H. J. Ennis

N. PETERS, Photo-Lithographer, Washington, D. C.

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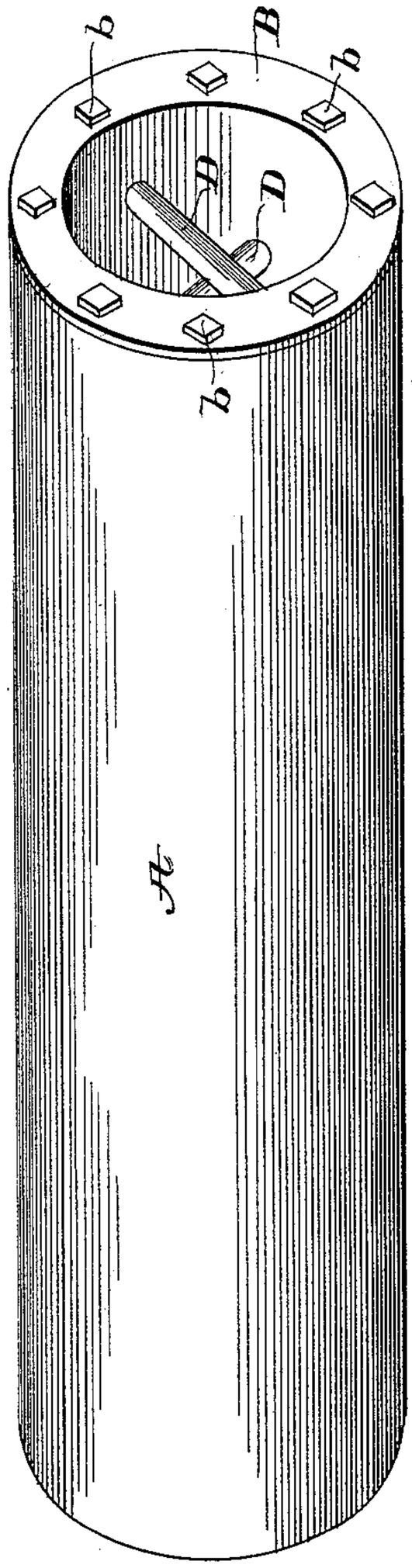

FIG. 2.

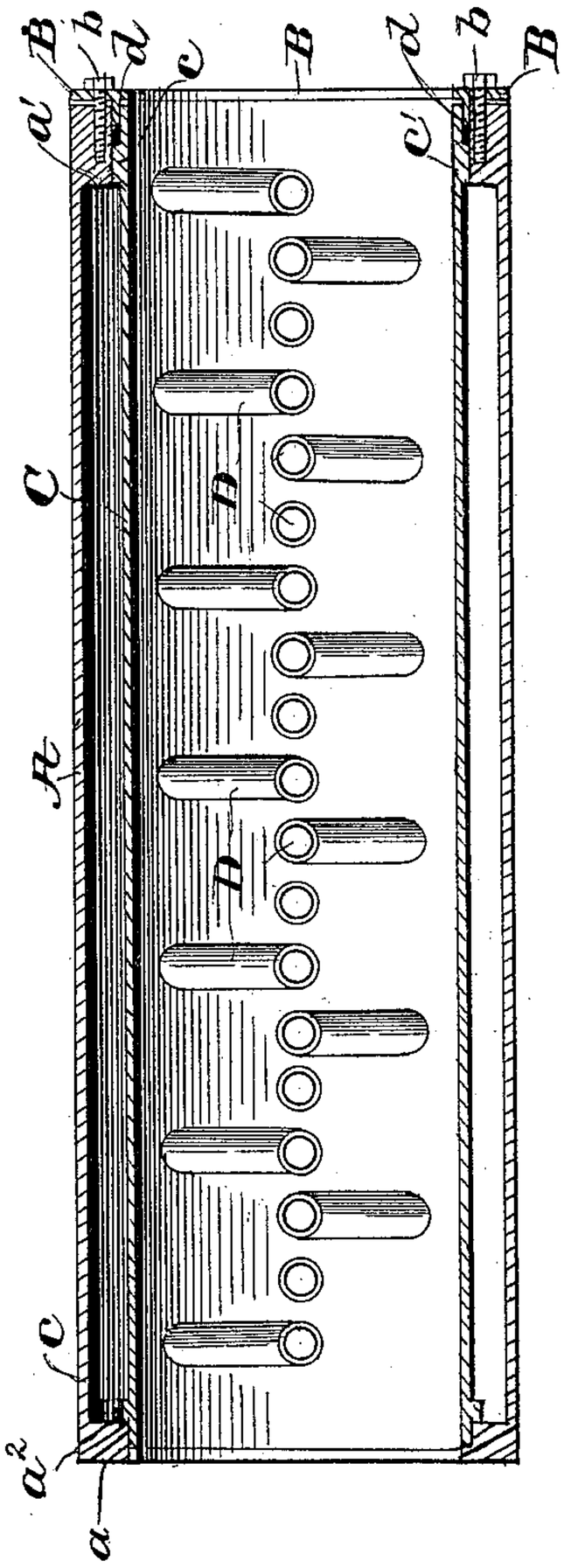

FIG. 3.

Witnesses

G. W. Taubeschmidt,

J. McNamee

Inventor

Daniel Dougherty

By his Attorney.

H. F. Finis

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

DANIEL DOUGHERTY, OF WASHINGTON, DISTRICT OF COLUMBIA.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 405,954, dated June 25, 1889.

Application filed March 26, 1889. Serial No. 304,772. (No model.)

To all whom it may concern:

Be it known that I, DANIEL DOUGHERTY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Safety Steam-Generators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to steam boilers or generators, and more particularly to that class known as "sectional" boilers; and the object of the invention is to produce a generator of this class capable of making steam rapidly and at the same time with safety, and also to provide means whereby access may be had to the interior of the sections for readily removing scale and sediment and making repairs when necessary; and to these ends the novelty consists in the construction, combination, and arrangement of parts of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings the same letters of reference indicate like parts of the invention.

Figure 1 is a front elevation of my improved safety steam-generator. Fig. 2 is a longitudinal perspective view of one of the sections, and Fig. 3 is a longitudinal section of the same.

A is a shell, which may be of any suitable length and diameter to conform to the use to which the boiler is to be put. This shell is provided with internal annular heads *a a'*, the rear one *a* being faced off at a^2 and the forward one having a series of stud-bolts *b*, by means of which the gland B is secured in place.

C is an internal tube provided with external collars *c c'*, the outer face of the collar *c* being faced off to form a joint with the head *a* at a^2. Between the collar *c'* and the gland B is placed any suitable packing *d*, and as the gland is screwed up the packing *d* is forced against the collar *c'*, and consequently the tube C is forced backward and the rear collar *c* and annular head *a* are brought into such intimate contact as to form a steam-tight joint at this point, while the packing makes a joint at the other end.

D D are a series of tubes inserted and expanded in the central tube C at suitable distances.

E E are a series of tubes connecting the shells A, and furnish a water communication between them, as clearly shown in Fig. 1. Wherever the peripheries of the shells A come into contact a series of short tubes or ferrules *e* are inserted at suitable distances to allow of a free communication and circulation of the water between said shells.

Of course it will be understood that the shells may be of any suitable diameter and length and any number may be arranged and built up to correspond to the use to which the boiler is to be put—as, for instance, for a stationary boiler, where there is plenty of room, the plan shown in Fig. 1 may be adopted, in which the products of combustion or heat first pass under the shells and out at the rear, thence returned through the tubes C and outward to the smoke-stack, while in the case of marine boilers the shells would necessarily be shorter, owing to the limited room, and a suitable casing will be employed, so that the draft will pass under the shells, back through the tubes, and thence returned to the stack over the shells, thus securing a double return draft; or it may be returned through the lower sections and passed back through the upper sections, as will be found most convenient.

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

1. A sectional boiler consisting of a shell A, provided with internal annular heads *a a'*, and packing-gland B, in combination with an interior longitudinal tube C, having collars *c c'*, as set forth.

2. A sectional boiler consisting of a series of shells A, having internal annular heads *a a'*, and gland B, in combination with a series of interior longitudinal tubes C, having collars *c c'*, and a series of smaller tubes connecting said shells, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL DOUGHERTY.

Witnesses:

J. MCNAMEE,

H. J. ENNIS.