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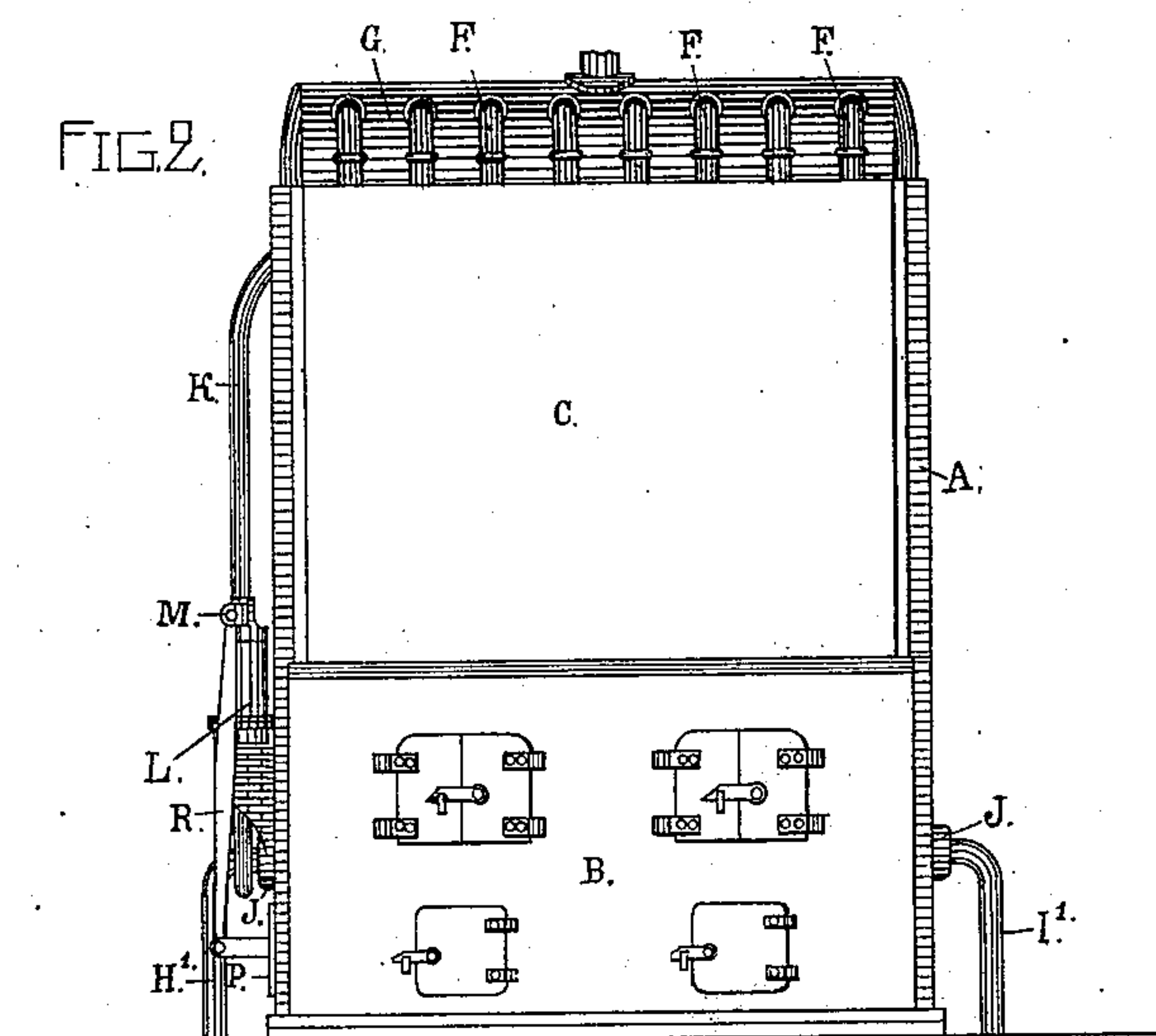
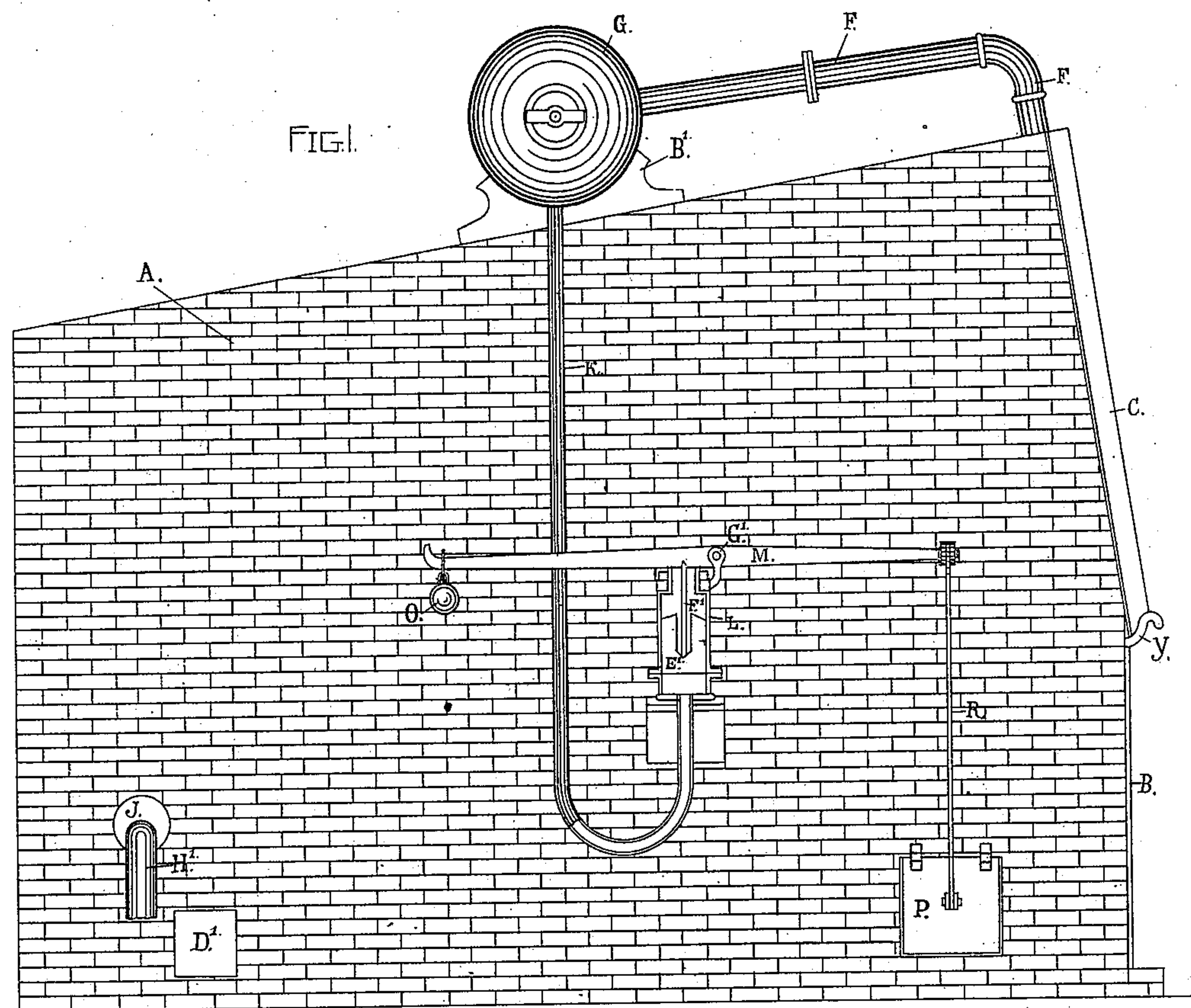
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C. N. HITCHCOCK.

STEAM BOILER.


No. 352,825.

Patented Nov. 16, 1886.



ATTEST,

ATTEST,
K. L. [Signature]
Wm. J. Rittler.



 C. W. Kitchcock
 INVENTOR,
 by H. B. Harris
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(No Model.)

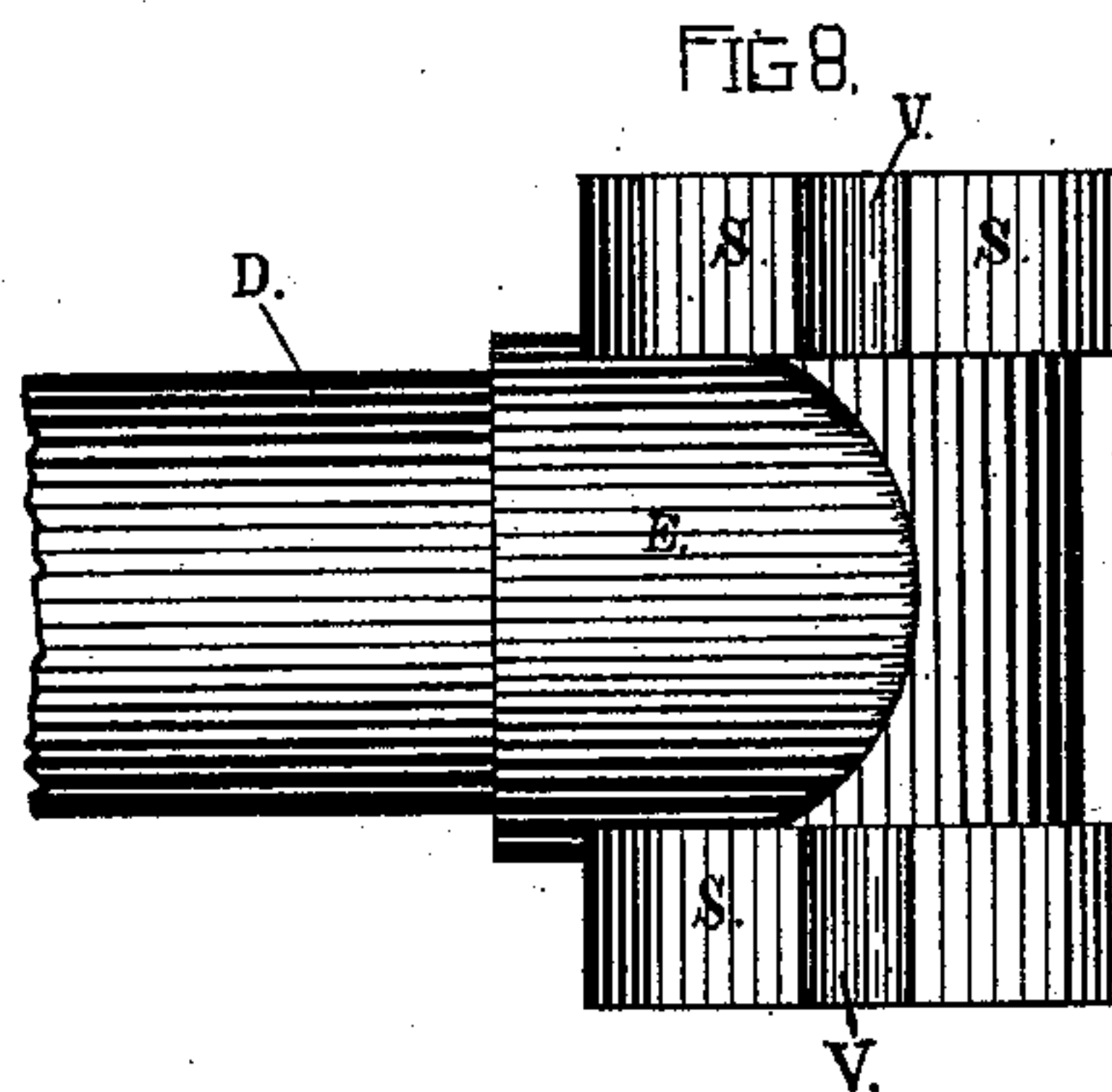
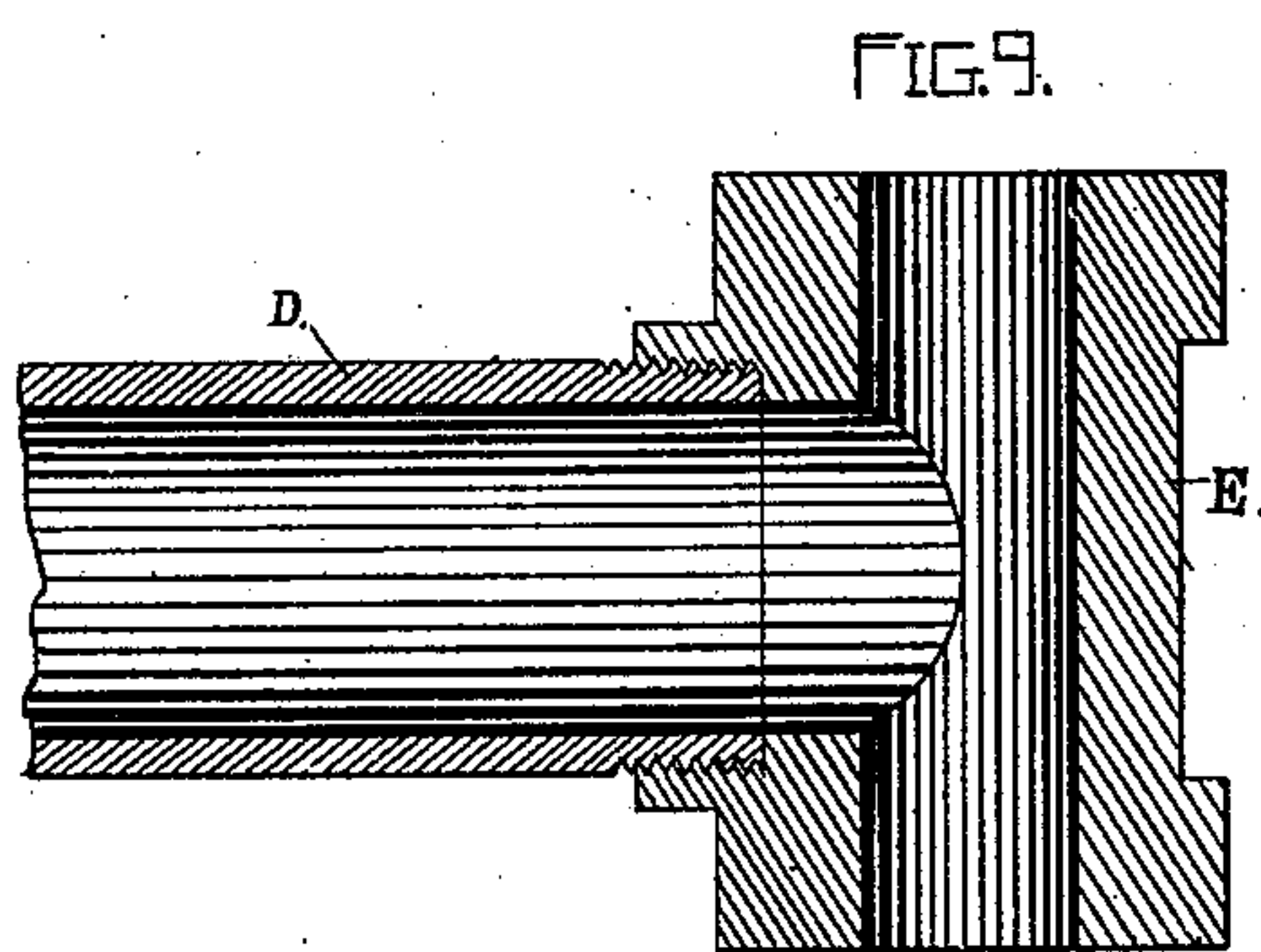
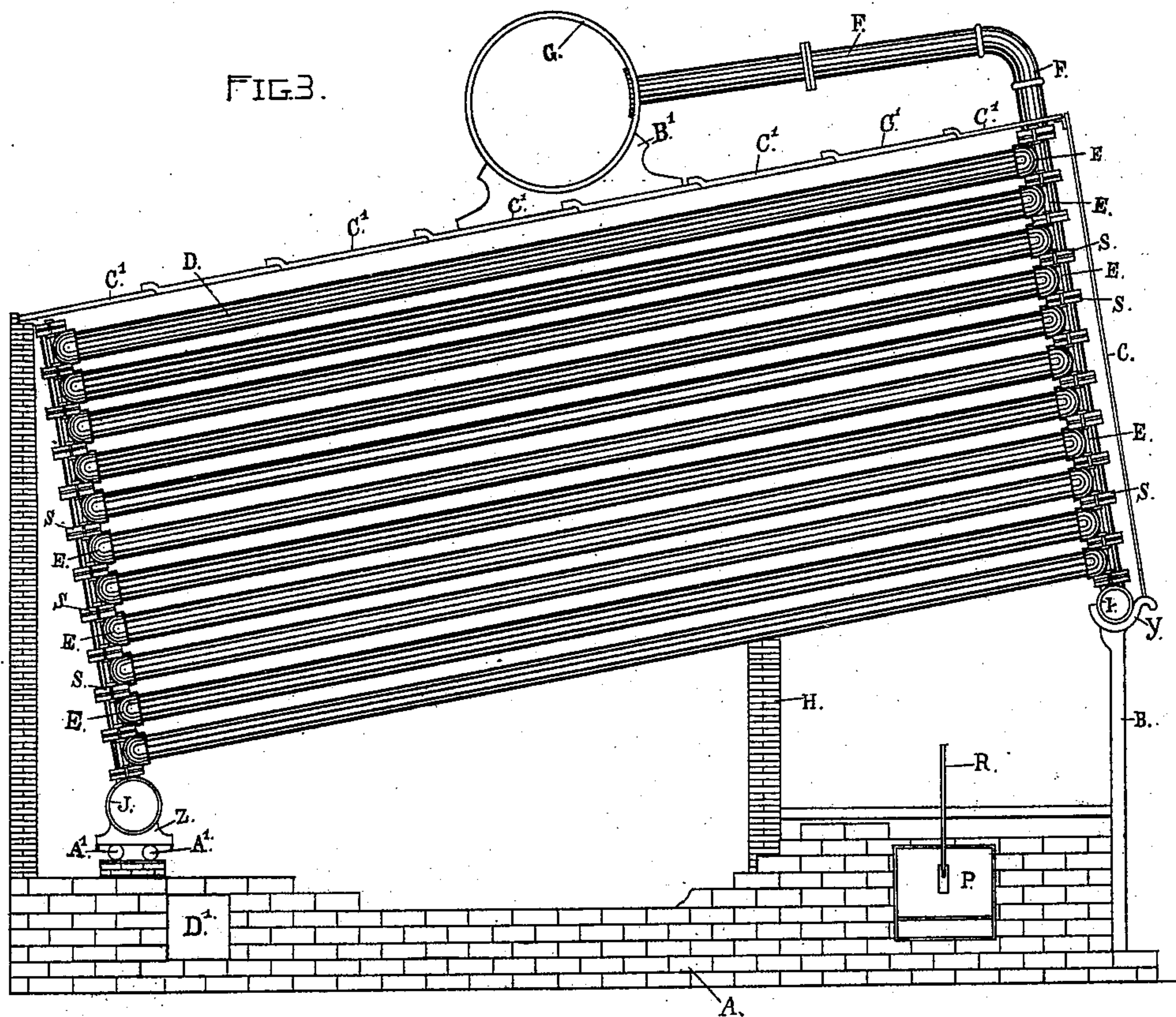
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T. L. Harnes
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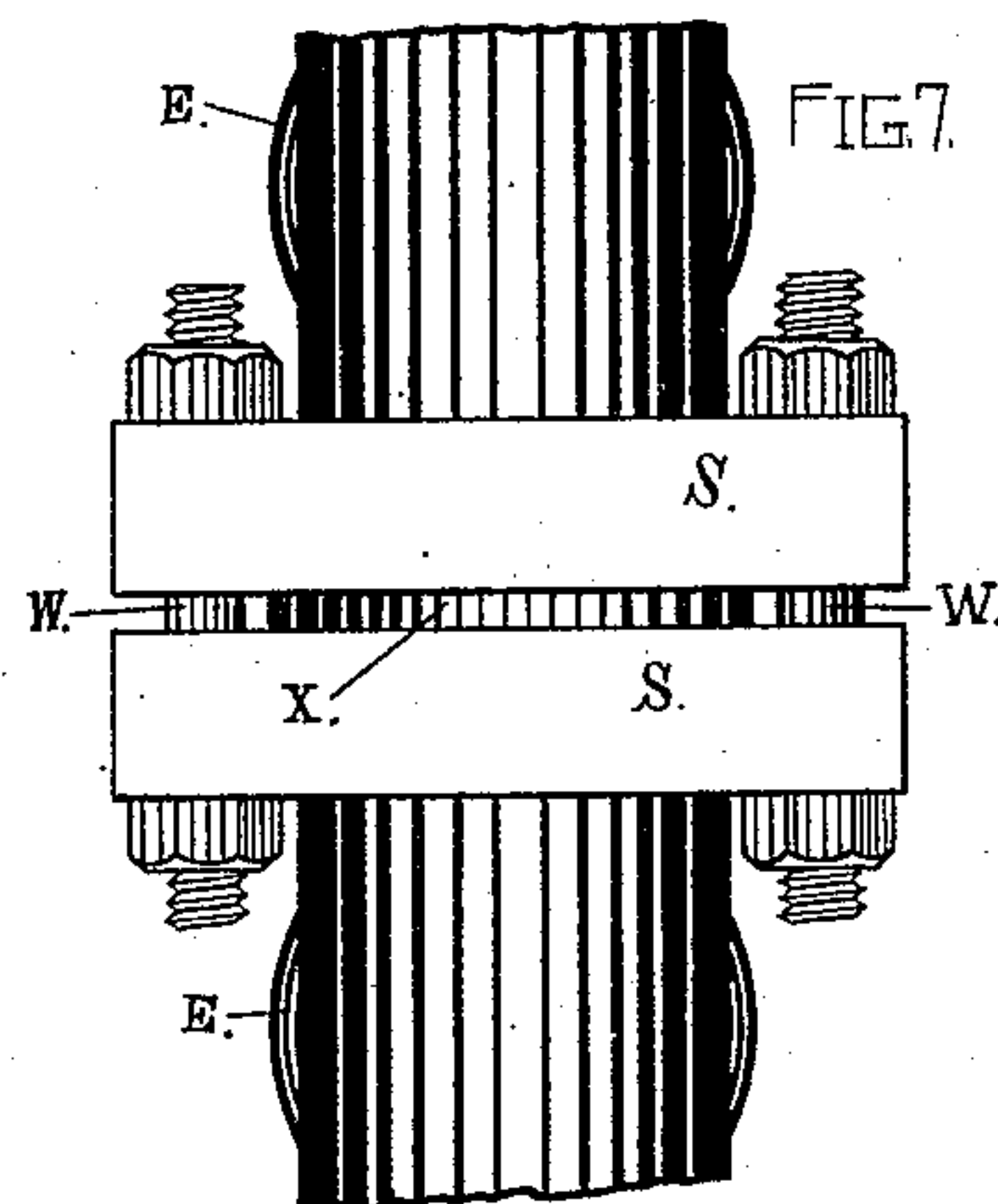
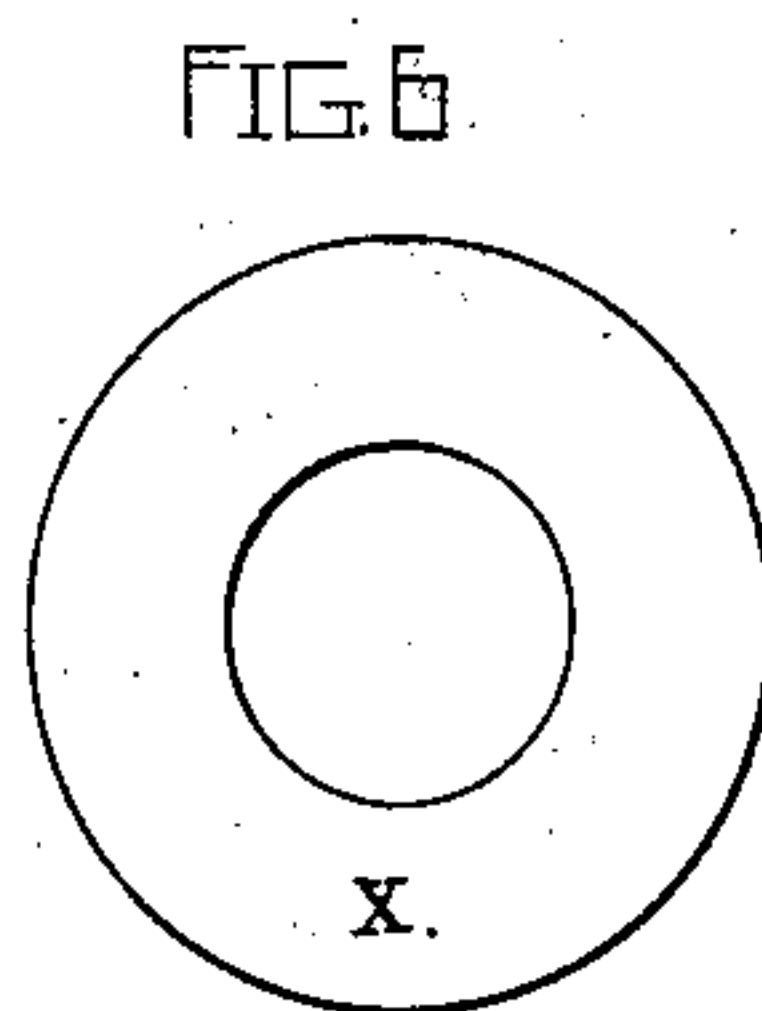
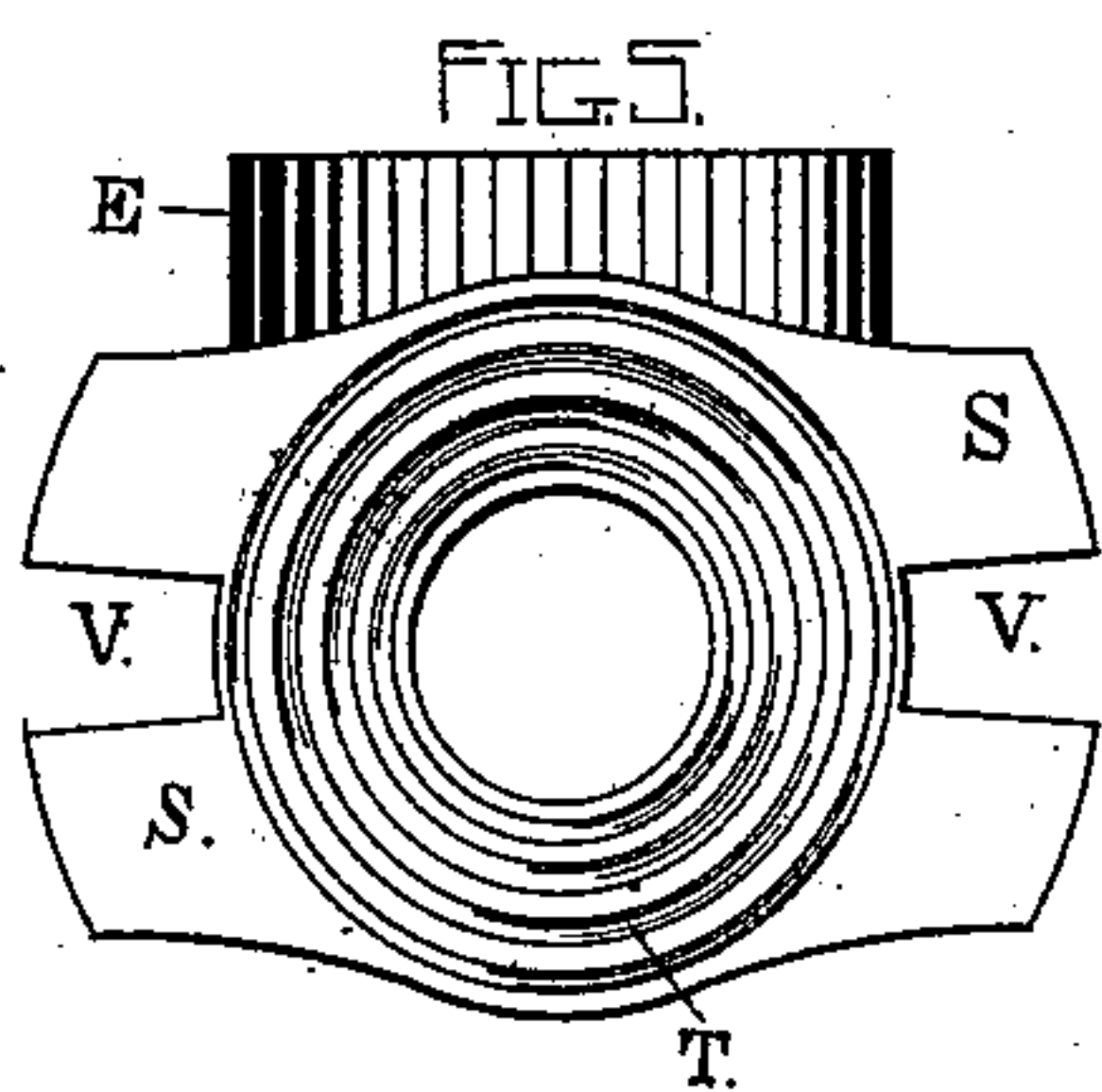
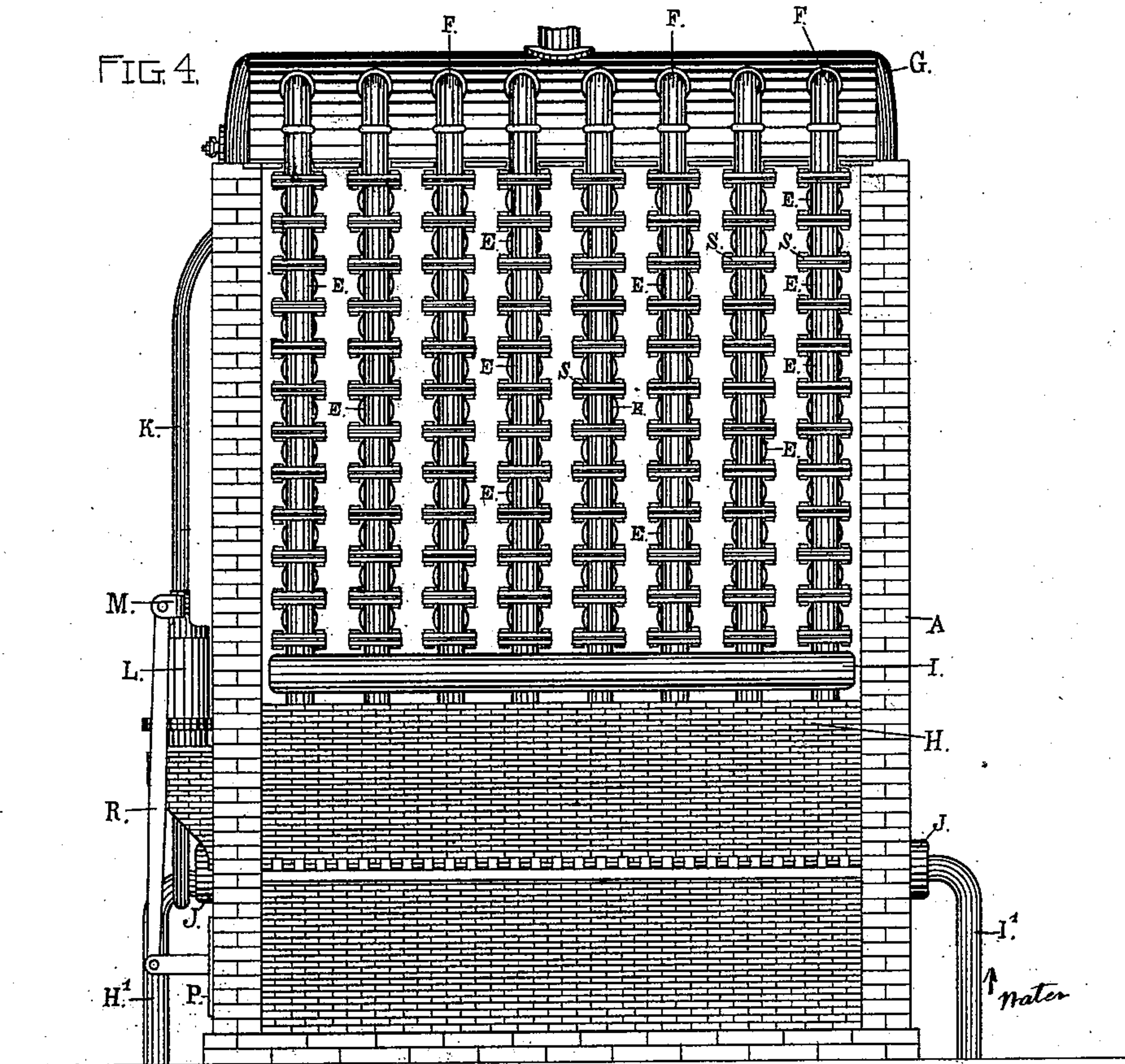
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STEAM BOILER.

No. 352,825.

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ATTEST,
W. L. Harris
Wm. J. Little.

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UNITED STATES PATENT OFFICE.

CHARLES N. HITCHCOCK, OF STOCKTON, CALIFORNIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 352,825, dated November 16, 1886.

Application filed March 29, 1886. Serial No. 196,985. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. HITCHCOCK, a citizen of the United States, residing in Stockton, in the county of San Joaquin and State of California, have invented a new and useful Portable Tube-Connection for Steam-Boilers, of which the following is a specification.

My invention relates to improvements in steam-engine boilers or generators; and it consists in the construction and arrangement of tubes and tube-connections and fire-chamber by which a great economy in the consumption of fuel is effected and greater facilities are secured for repairing or replacing portions of the same when required. It will be more readily understood by reference to the accompanying drawings, and the letters marked thereon.

Figure 1 is a side elevation of the same, showing one complete construction of my improved steam-generator. Fig. 2 is a front view of the same upon a reduced scale. Fig. 3 is a side elevation showing the side wall and a portion of the connections removed for the purpose of showing the positions of the tubes and the fire-box and heating-chamber. Fig. 4 is a front elevation showing the front removed for the purpose of showing the front tube-connections and the fire-box. Fig. 5 is a plan view of the tube-connections, showing the packing grooves. Fig. 6 is a plan view of the connecting-washer packing. Fig. 7 is a side elevation showing two broken sections of the tube-connections, with the washer-packing in position between the flanges as when used in connecting the tubes. Fig. 8 is a side elevation of the tube-connections with a broken part of the tube, and Fig. 9 is a section showing the same cut vertically through the center.

The following is the construction of my improvement in steam-generators.

I form the hot-water tubes constituting the boiler proper and heating-surface in the usual manner of the best homogeneous metal, and I connect them vertically by means of the connections or couplings E, both in front and rear, so that each vertical row of tubes is only connected with the others by means of the manifolds I and J, and through the steam-dome G by means of the connecting-tubes F. I connect the

steam-pipe leading to the engine in any required manner well known to the art. I construct the trough-bed Y to allow the manifold I to rest freely in the same and allow whatever room is required for the expansion of the metal produced in the manifold by the change of temperature. I form the bed Z to receive the manifold J in the trough or upper concave surface of the same, while the lower surface is plain and rests upon the rolls A', so as to allow the motion required by the contraction and expansion of the tubes caused by the change of temperature. I construct an ordinary fire-front with any required design, and employ brick or any well-known material for the side and rear inclosing-walls. I employ any suitable saddle, B', resting upon the side walls, A, as the bed for the steam-dome. I employ the plates C' (constructed of cast metal, or any well-known suitable material to stand the heat of the furnace) as a furnace top or cover to complete the inclosure of the tubes composing the boiler and heating-surface. I place the bridge-wall at the rear of the fire-box, and raise it up to the lower line of boiler-tubes, so that as the heat passes up out of the fire-box it passes between the tubes, and as the draft is out at the flue D' it is again drawn down between the tubes D, thus producing a reverberatory effect.

For the purpose of regulating the consumption of fuel and the steam-pressure I employ the cylinder L, in which I allow the direct pressure of the steam through the steam-pipe K under the piston E'. I connect the draft-regulating lever M with the piston E' by means of the connecting-rod F'. The draft-regulating lever M is pivoted at G', and connects with the draft valve or door P by means of the connecting-rod R.

The manifold J is supplied with water through the pipe I' from any pump or other well-known means of supplying water for steam-boilers. The pipe H' represents any blow-off pipe for cleaning the sediment from the boiler.

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

1. The bed Z, in combination with the rolls

A', for the purpose of supporting the manifold J and allowing the motion required by the expansion and contraction of the water-tubes D, constructed and operated substantially as
5 and for the purposes set forth.

2. The tubes D, arranged in vertical rows connected only at the bottom by the manifolds I and J, and at the top by means of the tubes F, connecting with the steam-drum G, supported
10 by the saddle B', for the purpose of securing

a separate action in each of the rows, thereby allowing a whole row to be thrown out of use by closing the top and bottom connection, constructed and operated substantially as and for the purposes set forth.

CHARLES N. HITCHCOCK.

Witnesses:

JOHN H. REDSTONE,
L. E. REDSTONE.