

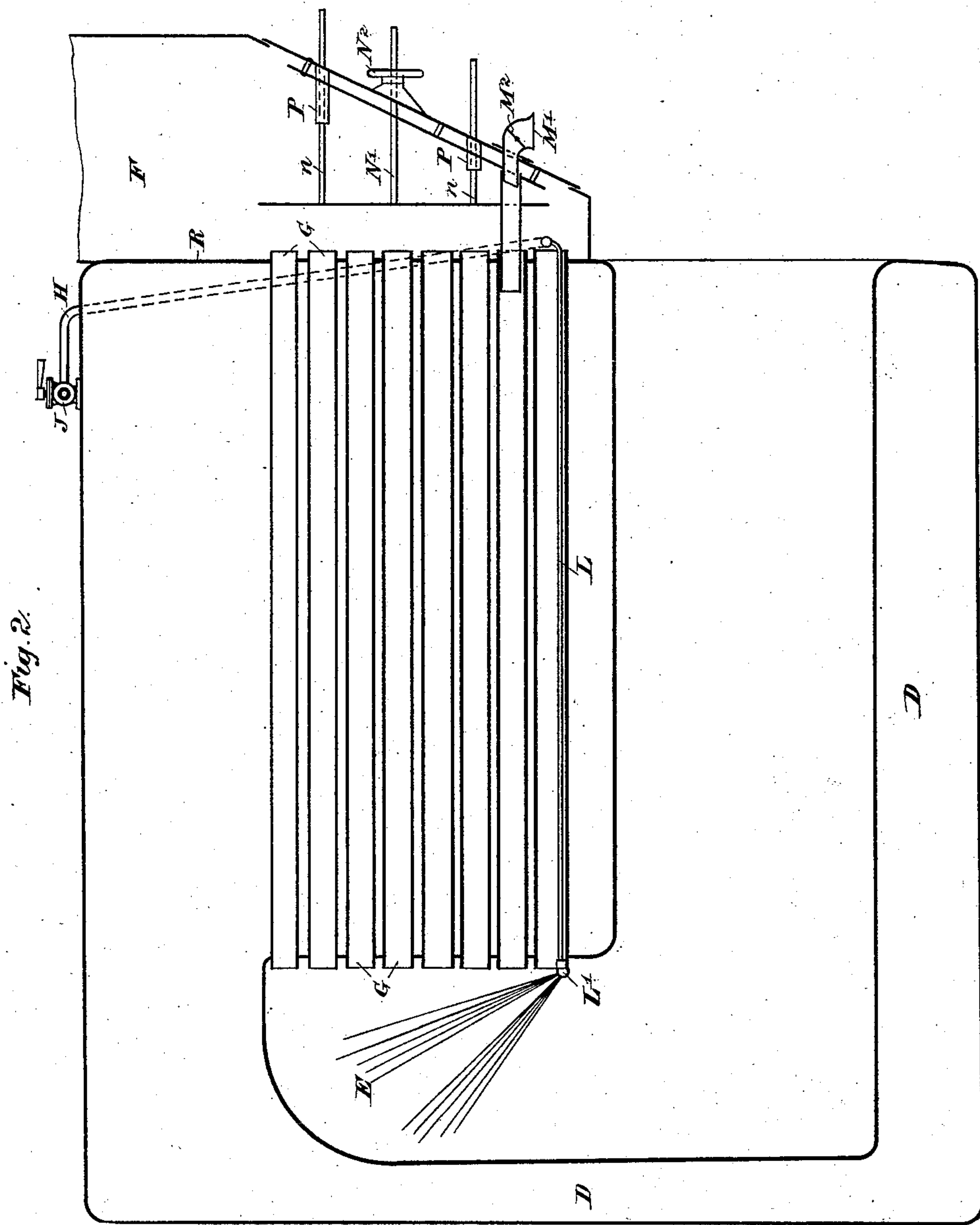
(No Model.)

3 Sheets—Sheet 2.

S. BOND.
SMOKE CONSUMING FURNACE.

No. 365,571.

Patented June 28, 1887.



Witnesses:
Harry S. Rolver,
Charles O. Lincoln

Inventor:
Stephen Bond

By his

Wtys.
Harding & Tichenor

(No Model.)

3 Sheets—Sheet 3.

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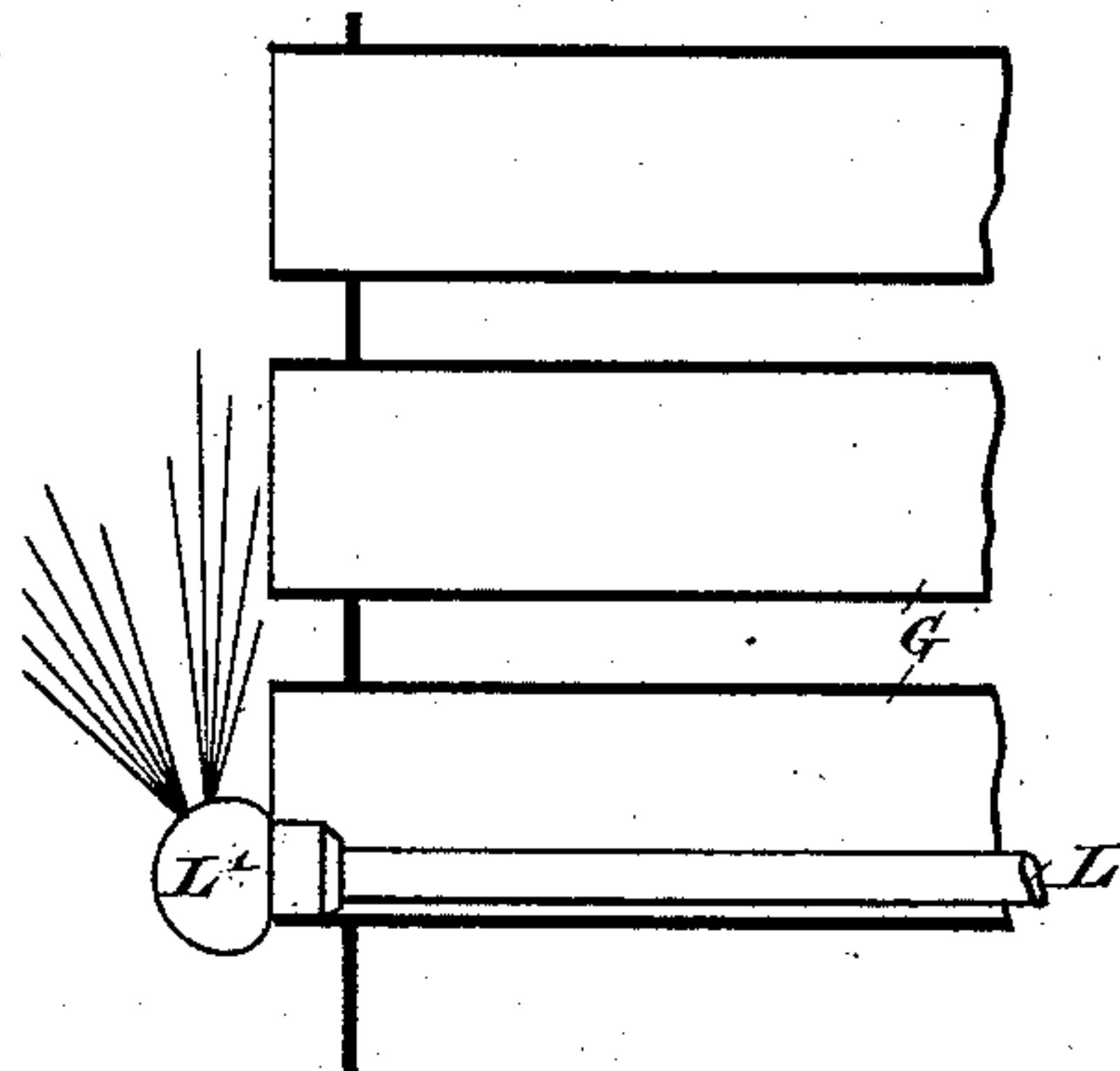


Fig. 4.

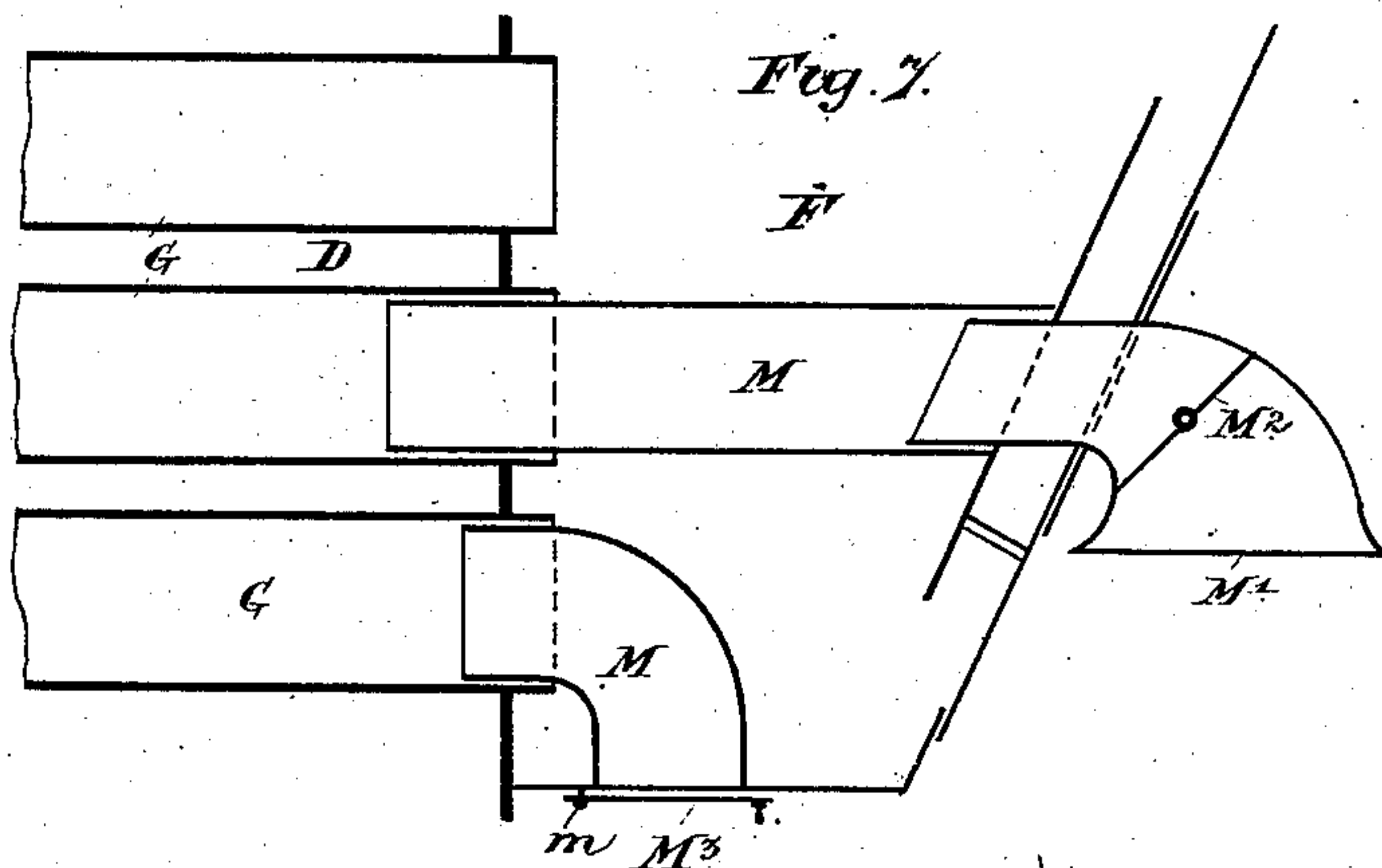
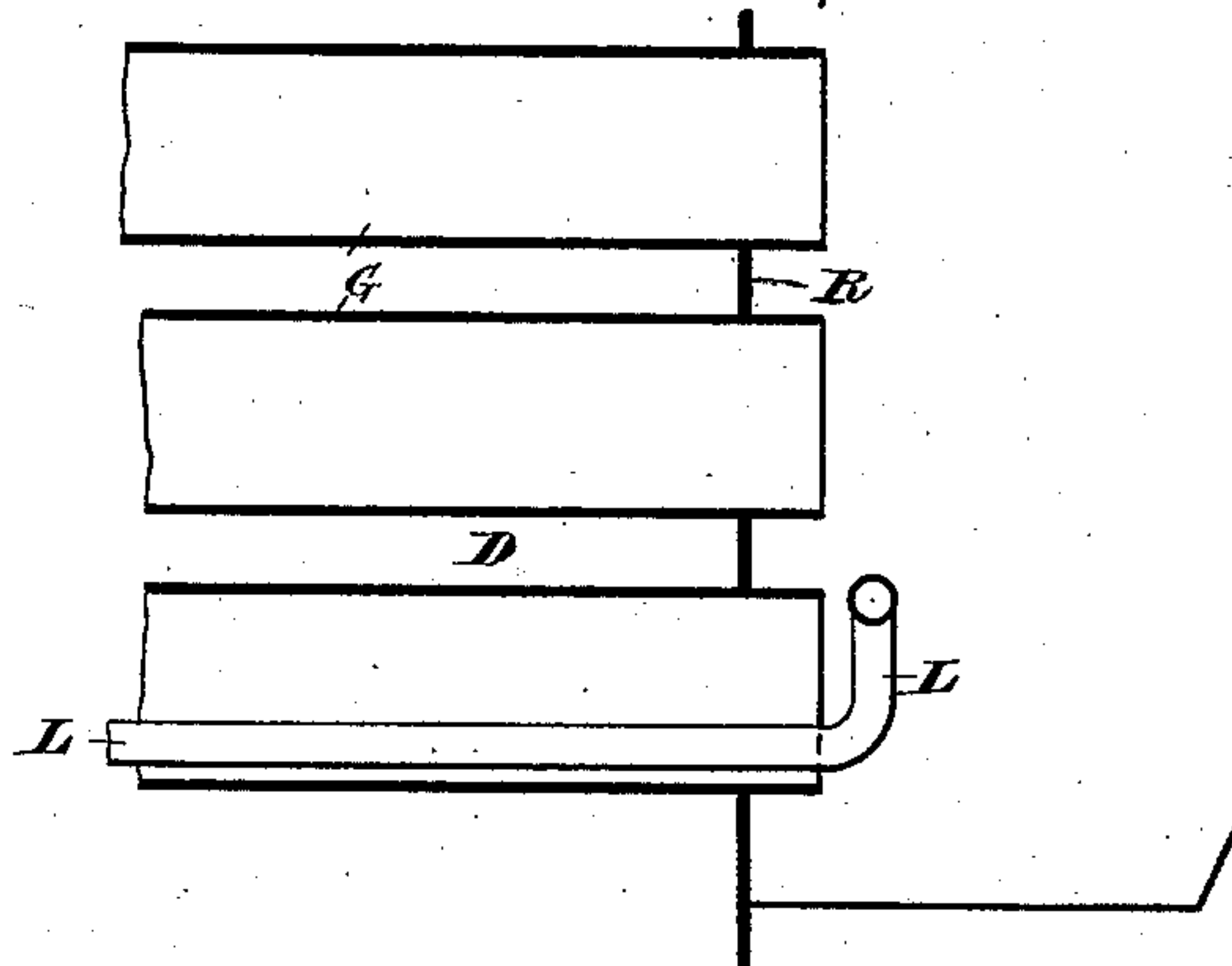


Fig. 7.

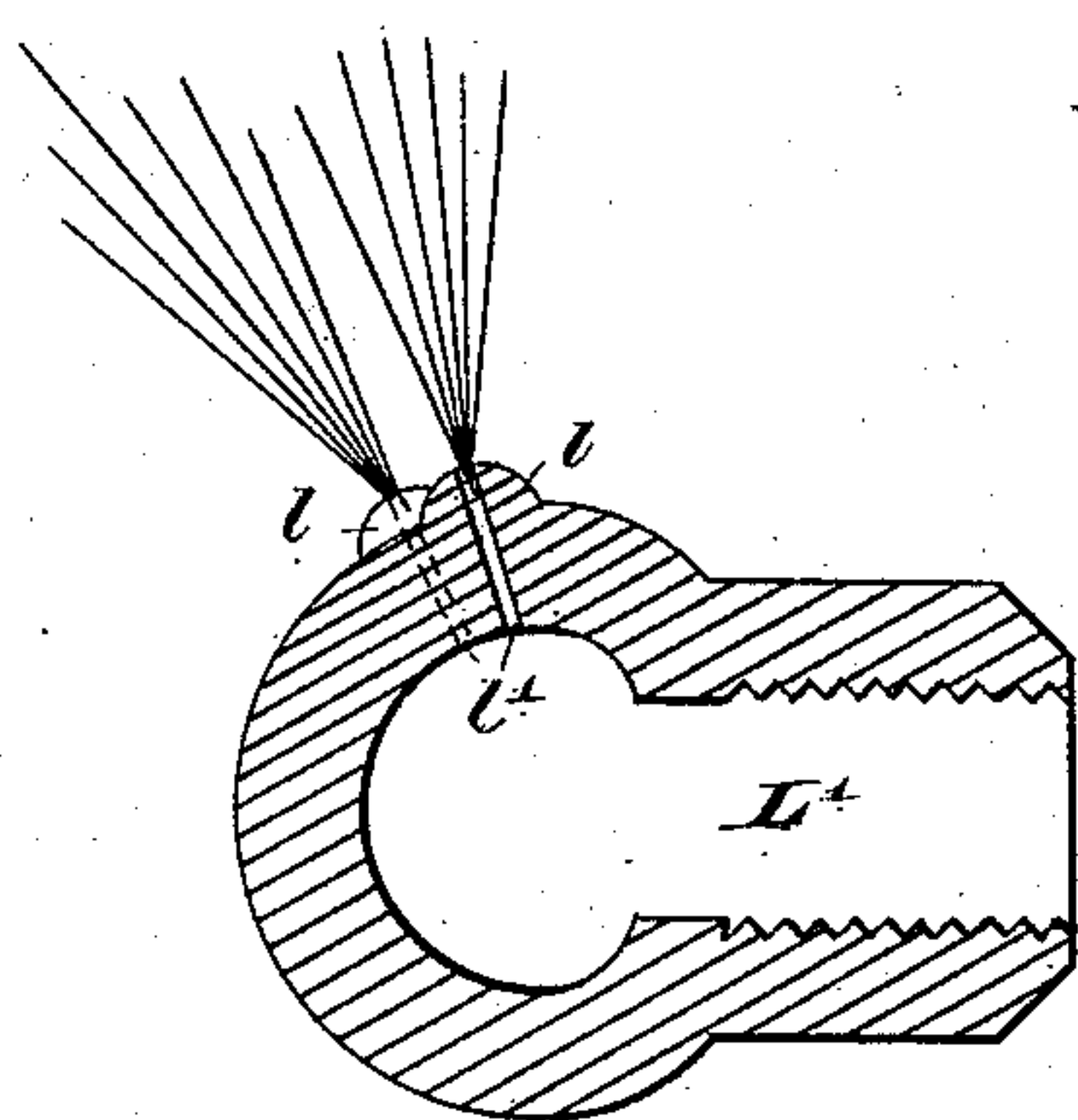


Fig. 5.

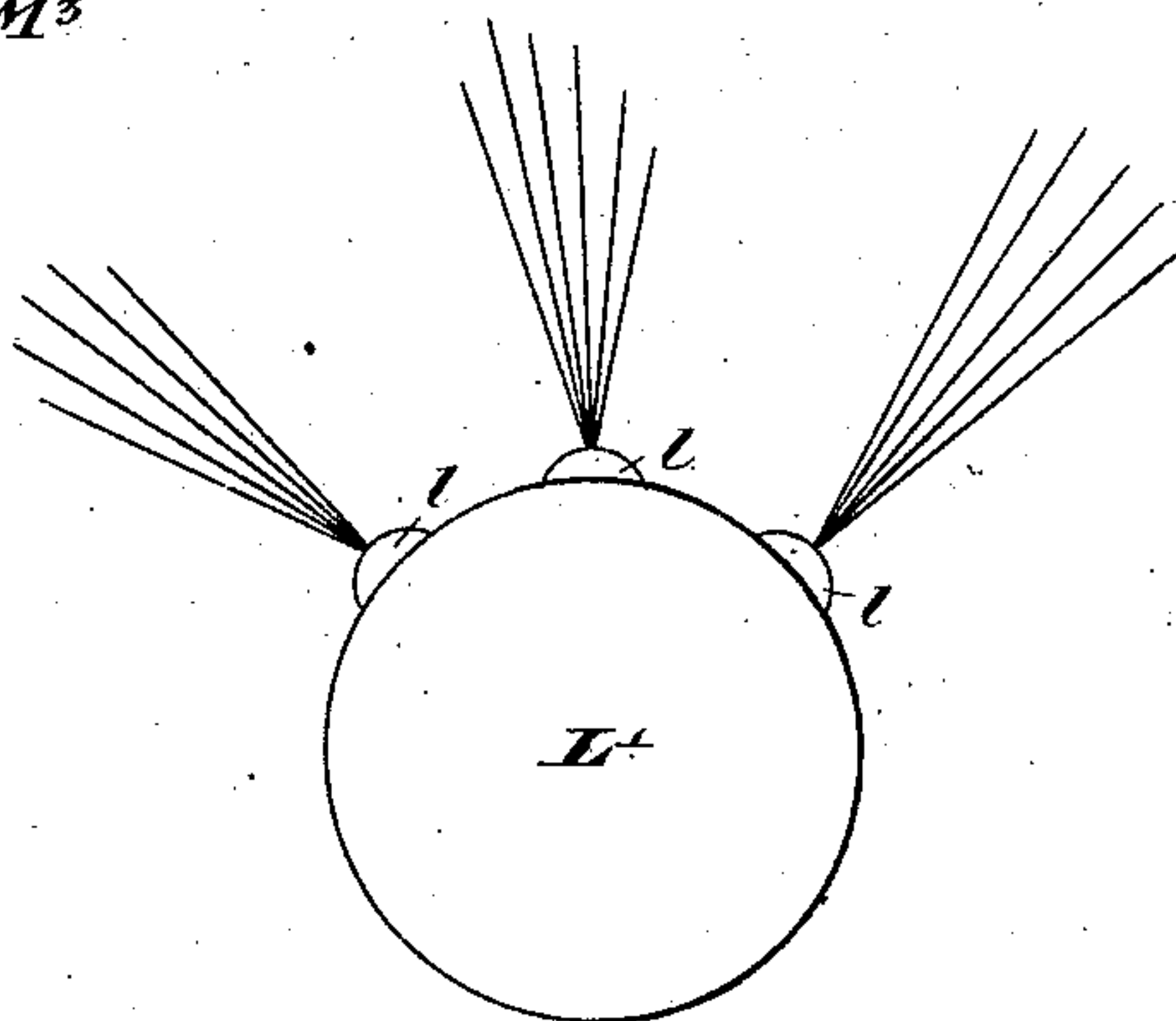


Fig. 6.

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Charles Lincoln

Inventor:
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By his Atty's.
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UNITED STATES PATENT OFFICE.

STEPHEN BOND, OF CONSTANTINOPLE, TURKEY.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 365,571, dated June 28, 1887.

Application filed April 18, 1887. Serial No 235,210. (No model.) Patented in England June 30, 1886, No. 8,583.

To all whom it may concern:

Be it known that I, STEPHEN BOND, a subject of the Queen of England, residing at Constantinople, in Turkey, engineer, have invented certain new and useful Improvements in Smoke Consuming Furnaces, of which the following is a specification.

This invention relates to apparatus for effecting the consumption of smoke in steam-boiler and other furnaces by the introduction into the combustion-chamber of highly-superheated steam and heated air. The exact form of apparatus and the manner of applying the same will vary with the type and size of boiler or furnace. In a horizontal return-tube boiler I carry a pipe from the top thereof into the smoke-box, across the bottom of which it extends. To this pipe I connect branch pipes passing through the tubes from the smoke-box to the combustion-chamber and terminating in jets or distributors. The air is supplied by means of one or more tubes which pass through the smoke-box and afford a communication between the boiler-tubes and the outer air, the admission of air being regulated by valves fitted to the ends of the tubes in the combustion-chamber. For regulating the escape of the heated gases and air I employ a damper or shield placed parallel with the tube-plate in the smoke-box opposite the ends of the tubes. The shield may be mounted on parallel horizontal guides, and can be moved nearer to or farther from the ends of the tubes by means of a screw projecting through the front of the smoke-box and provided with a hand-wheel.

In the accompanying drawings, Figure 1 represents a front elevation of a return-tube boiler with one smoke-box removed. Fig. 2 is a longitudinal sectional elevation of the same, the section being taken through the line A B. Fig. 3 is a partial elevation of the opposite or combustion end of the boiler. Figs. 4, 5, 6, and 7 are details of parts hereinafter referred to.

C is the outer shell of the boiler, D the water-space, E the combustion-chamber, and F the smoke-box.

G are tubes connecting the combustion-chamber and smoke-box.

From the highest part of the boiler two steam-pipes, H, are carried down to the level of the lowest row of tubes G, passing horizontally in front of the said row of tubes. The junction of the pipes H with the boiler is effected by means of the steam-cock J, while a regulating-valve, K, is inserted into each pipe in any convenient position. To the horizontal portion of each pipe H are connected branch pipes L, which pass from front to back of the boiler through the tubes G, and terminate in rose or T shaped heads having orifices or perforations of suitable size, and so arranged as to direct jets of steam over the whole of the combustion-chamber opposite the ends of the tubes G.

A suitable form of distributing-head is shown at L', Figs. 4, 5, and 6, the former an enlarged view in section of smoke-box F, tubes G, and pipes L, on the end of the latter of which is screwed the hollow knob or bulb L'. (Shown in detail in Figs. 5 and 6.) Nipples l, formed of any metal capable of withstanding the wearing action of the steam, are formed on the exterior of the hollow bulb, and perforations l' are provided for the passage or escape of the steam, the number and size of the perforations being capable of variation. By opening the cocks J and K highly-superheated steam in a finely-divided state may be ejected into the combustion-chamber, where it will become intimately mixed with the inflammable gases and particles of smoke or carbon therein and assist in the combustion thereof, thereby preventing the passage of smoke or unconsumed fuel through the tubes G.

Air is admitted to the combustion-chamber through the tubes G, several of which, situated in the two bottom rows, communicate with the outer air through pipes M, terminating outside the smoke-box. The ends of these air-pipes may either project beyond the side of the smoke-box, with an expanding-orifice, M', in the interior of which is situated a regulating-valve, M², or the pipe may stop flush with the side or bottom of the smoke-box, and the admission of air be regulated by means of a cut-off plate, such as M³, working on a pivot, m, fixed to the side or bottom of the smoke-box. (See Fig. 7.)

(No Model.)

G. B. BOOMER.
COTTON BALE TIE.

No. 365,572.

Patented June 28, 1887.

Fig. 1.

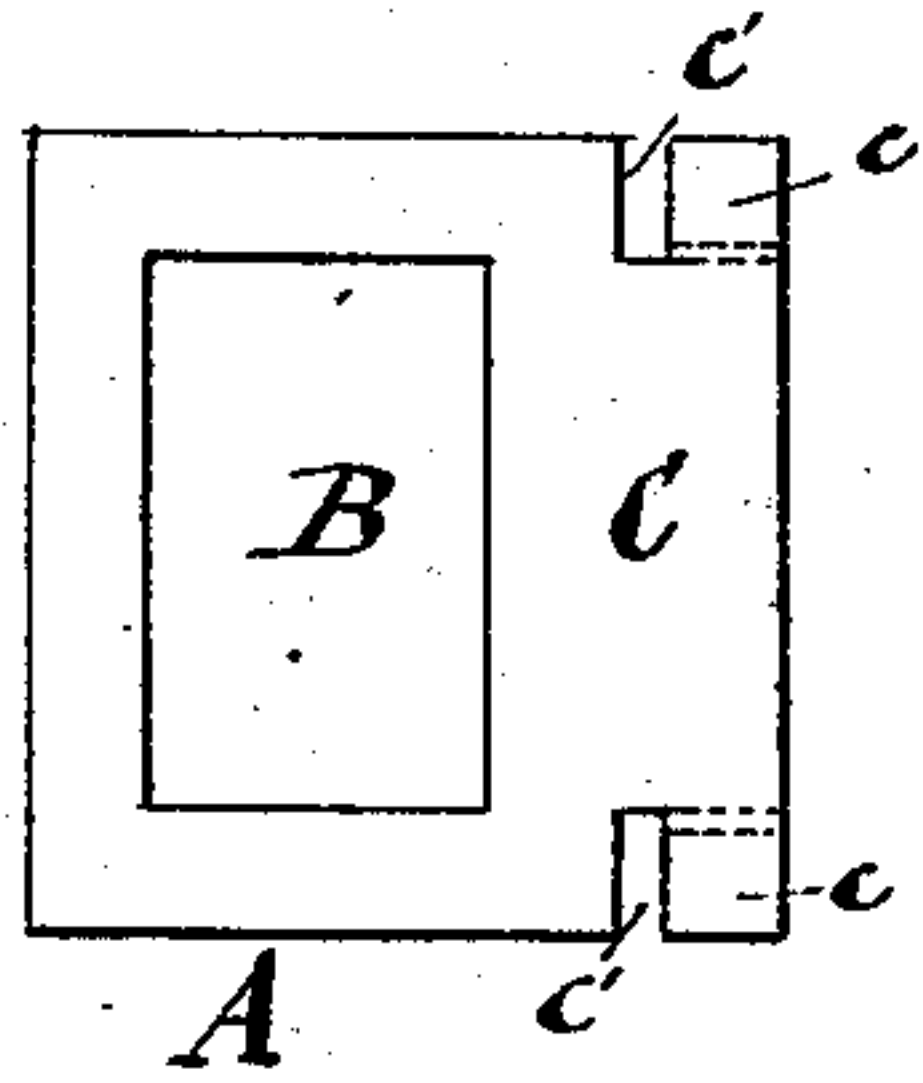


Fig. 2.

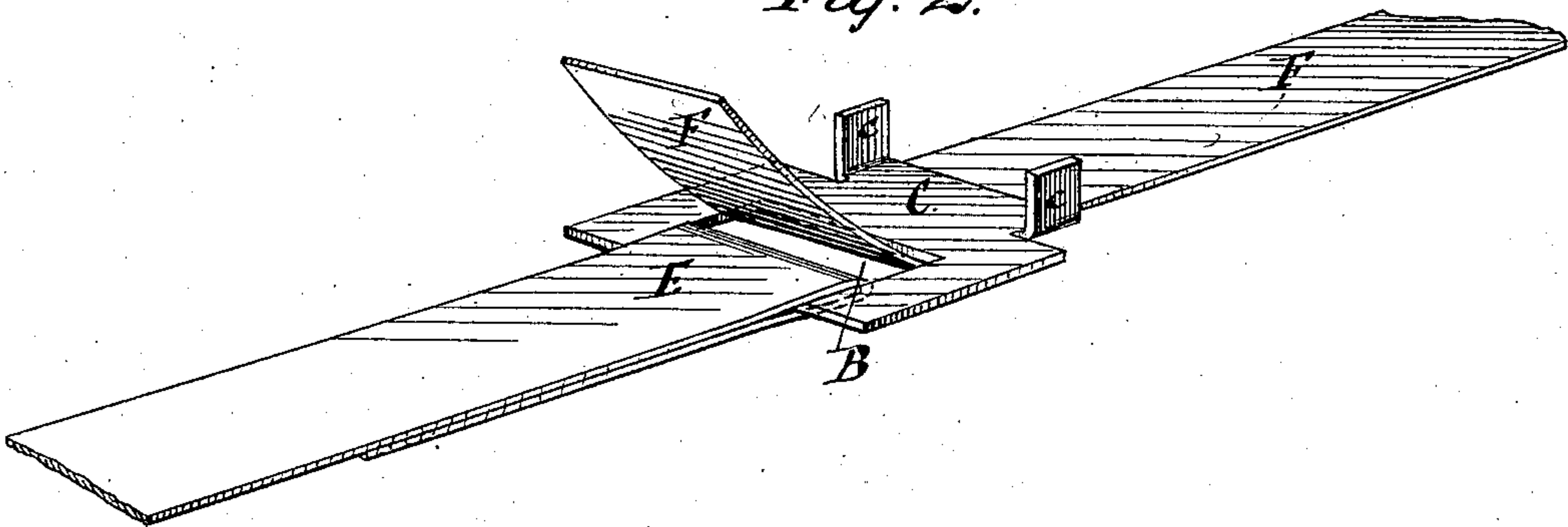


Fig. 3.

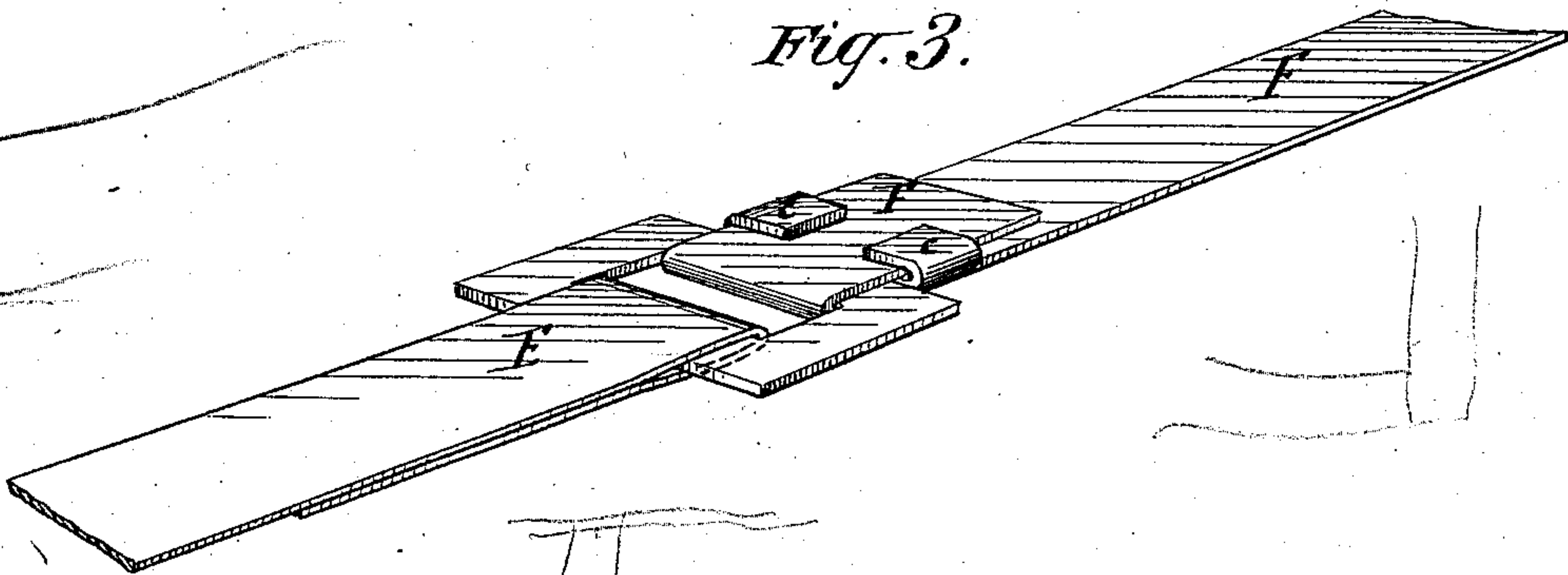
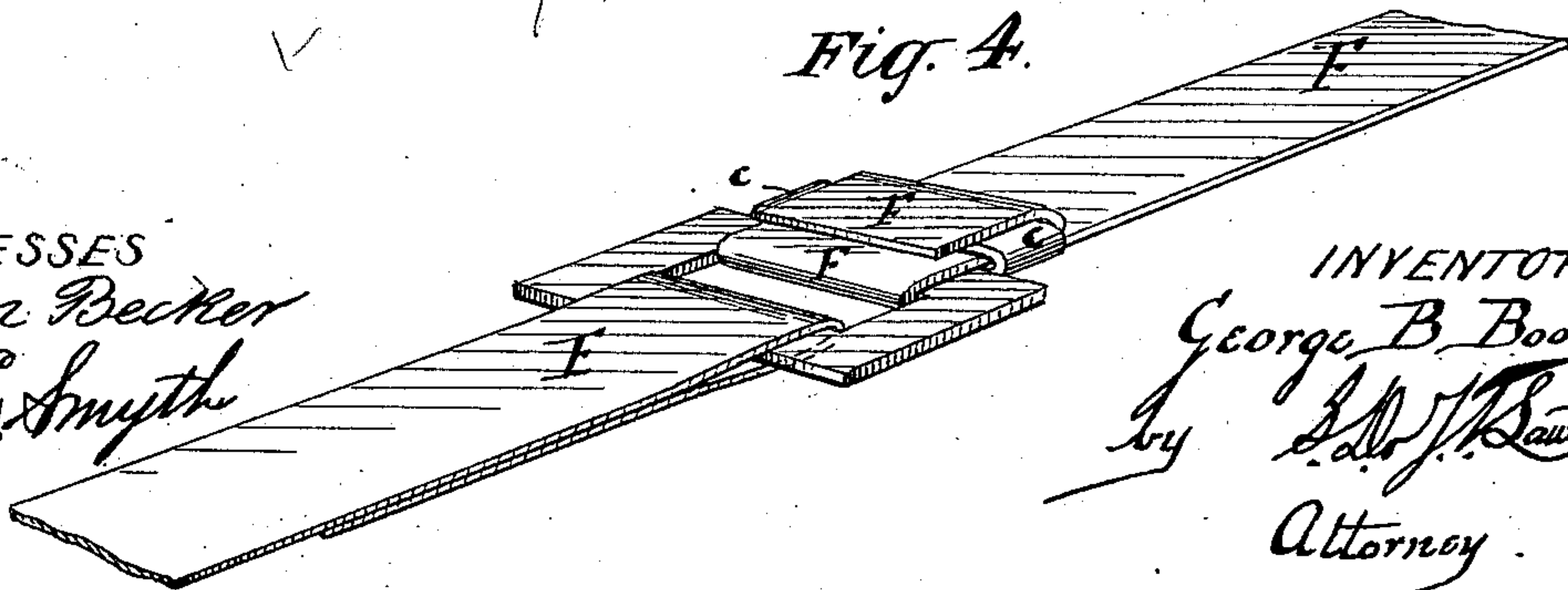


Fig. 4.



WITNESSES

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