

(No Model.)

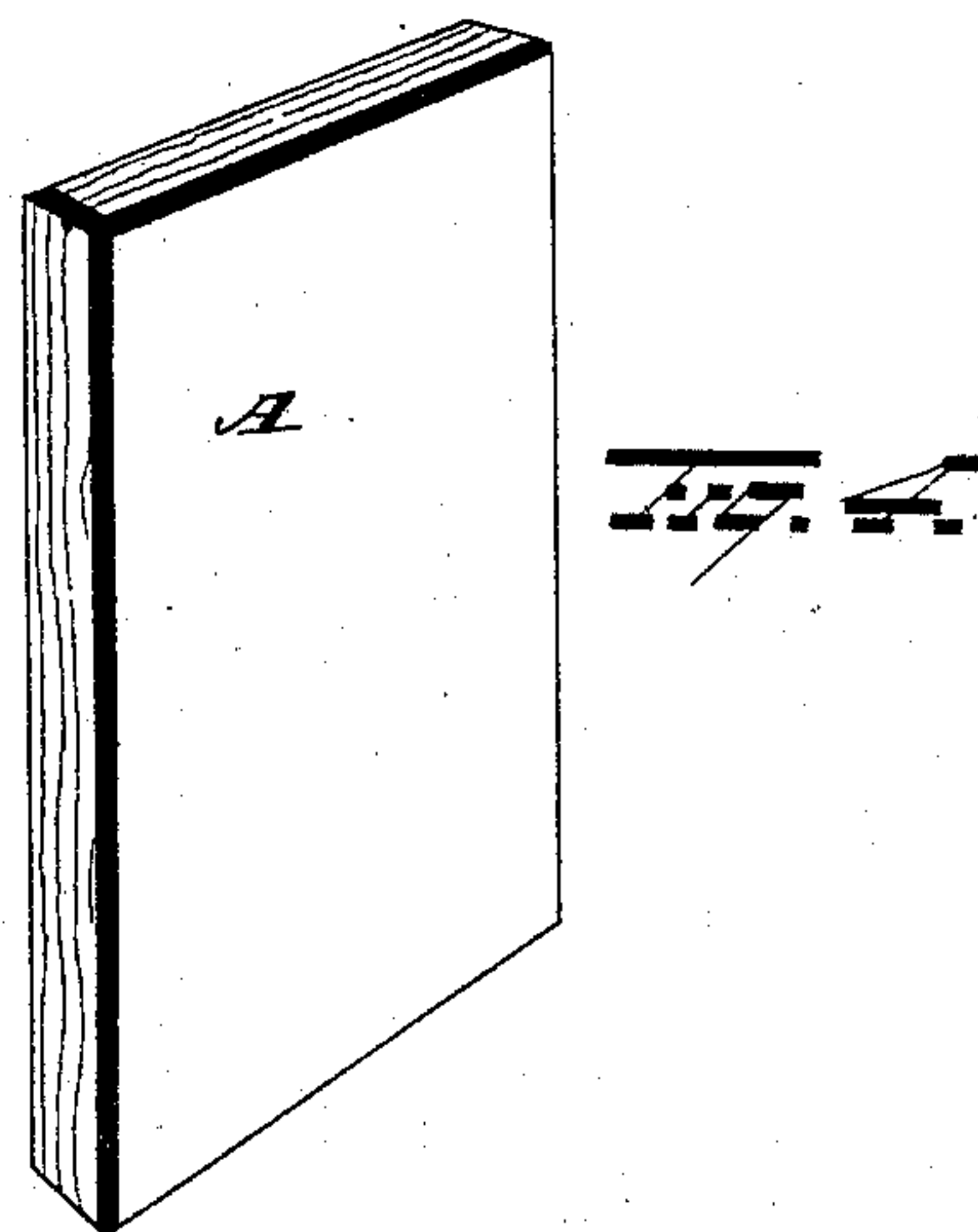
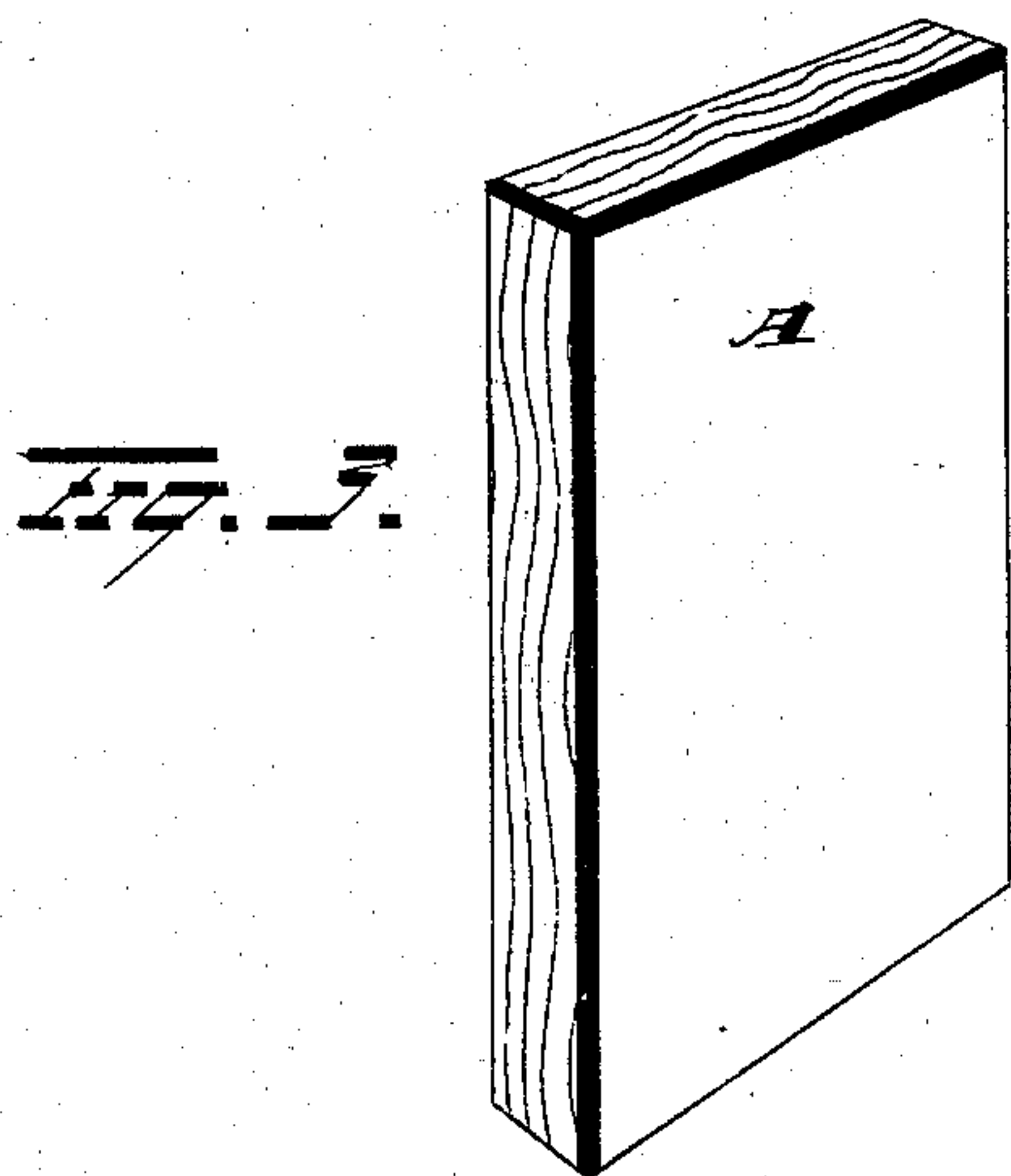
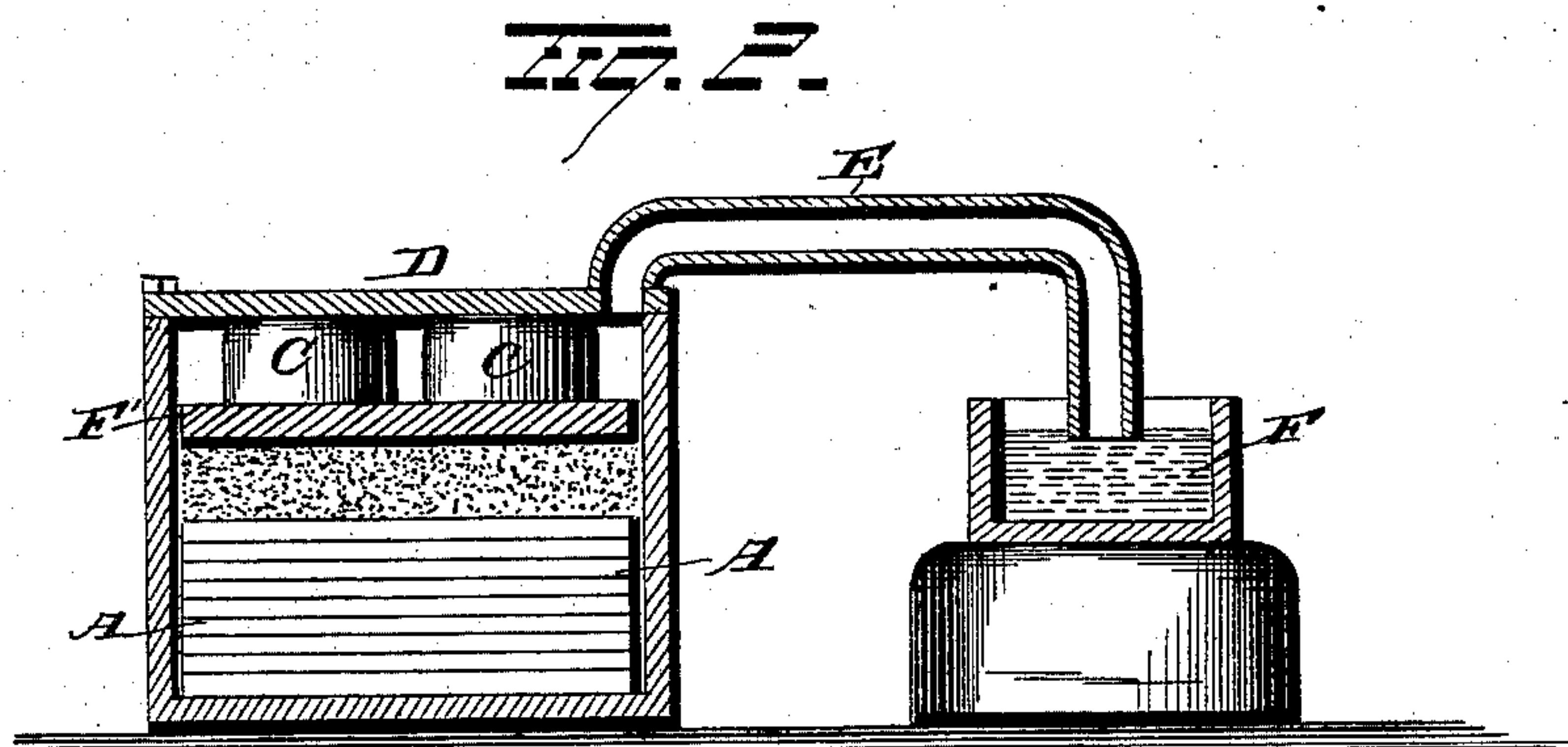
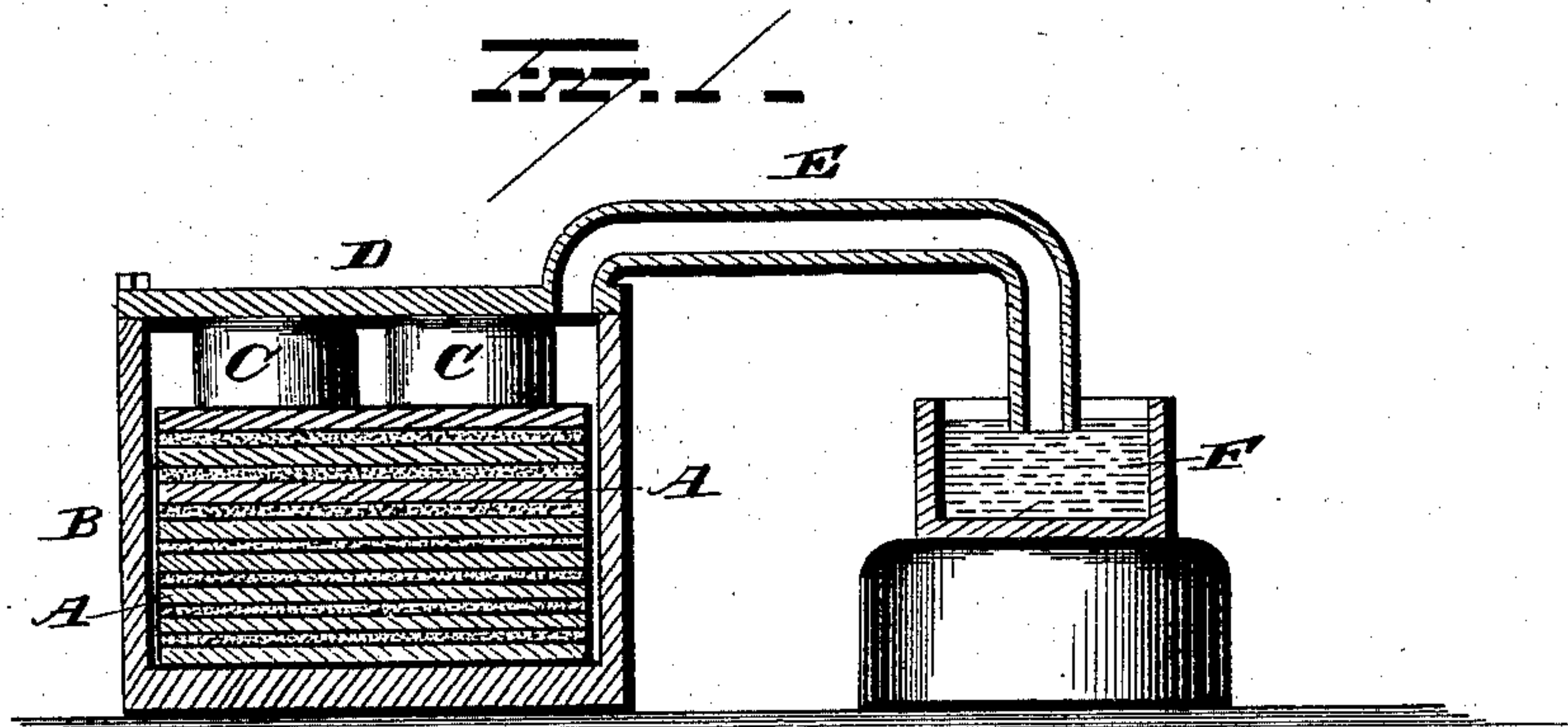
2 Sheets—Sheet 1.

E. J. MOLERA & J. C. CEBRIAN.

APPARATUS FOR MAKING CARBON PLATES.

No. 278,355.

Patented May 29, 1883.



WITNESSES

S. G. Nottingham.
George Cook.

INVENTOR

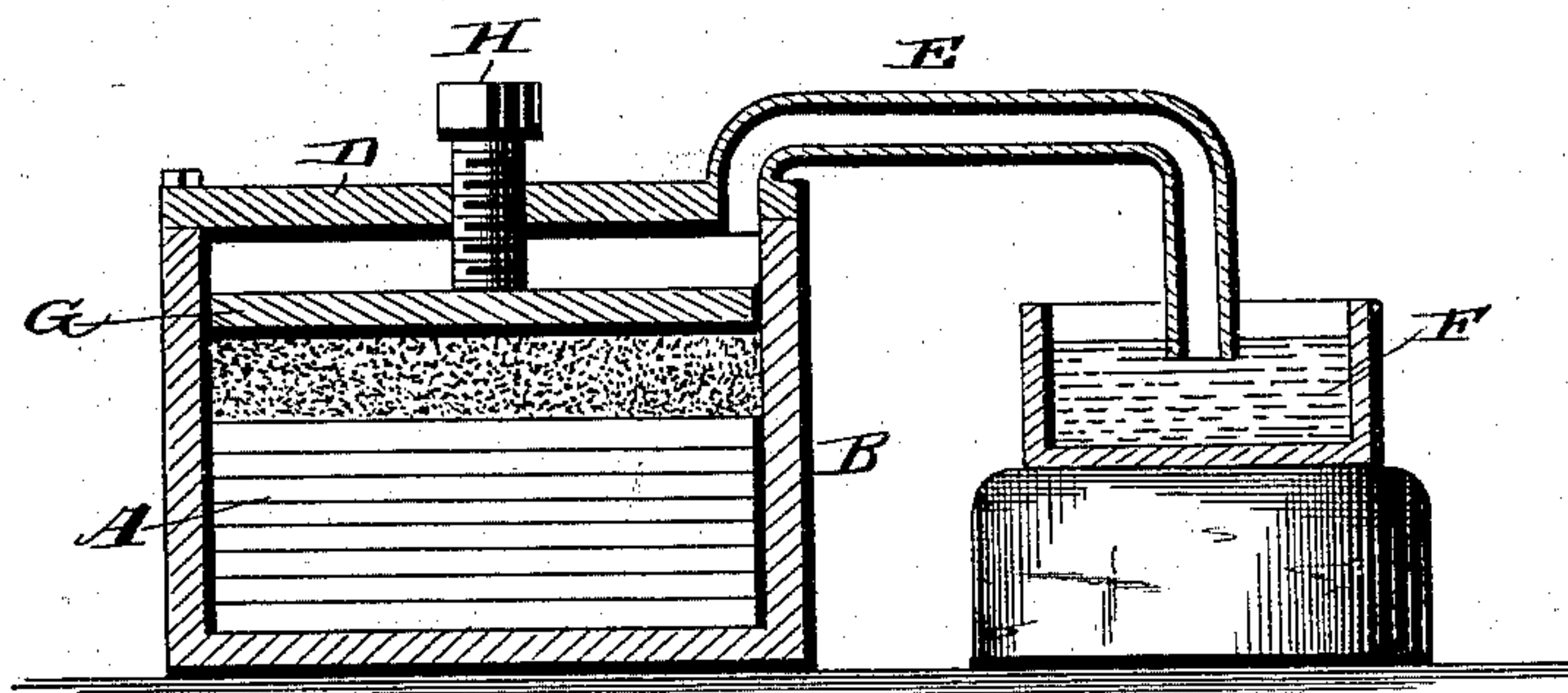
E. J. Molera,
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By H. A. Symmon. Attorney

2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

EUSEBIUS J. MOLERA AND JOHN C. CEBRIAN, OF SAN FRANCISCO, CAL.

APPARATUS FOR MAKING CARBON PLATES.

SPECIFICATION forming part of Letters Patent No. 278,355, dated May 29, 1883.

Application filed January 27, 1883. (No model.)

To all whom it may concern:

Be it known that we, EUSEBIUS J. MOLERA and JOHN C. CEBRIAN, of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Processes of and Apparatus for Making Carbon Plates for Secondary Batteries; and we do hereby 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 pertains to make and use the same.

Our invention relates to an improved process of and apparatus for making carbon plates for secondary batteries, the object being to produce plates which will have flat, even surfaces and be of uniform shape.

In the accompanying drawings, Figure 1 represents a view in vertical section of our apparatus. Fig. 2 is a similar view of a modification. Fig. 3 is a view in perspective of one of the plates or slabs before carbonization, and Fig. 4 is a similar view of one of the carbonized plates. Fig. 5 is a modification.

We take maple, box-wood, or any close-grained wood and saw it into slabs A of the desired size, or make the slabs or pieces A of thick pasteboard. These slabs or pieces A are then placed into an iron retort, B, the lower piece being placed on the bottom of the retort, while between the pieces we prefer to place layers of powdered or pulverized carbon—as, for instance, lamp-black. Upon the uppermost piece of the pile we place a block, C, consisting of an alloy composed of brass or tin, or antimony and tin, or antimony, tin, and bismuth, substantially in the proportions employed in the manufacture of type-metal. We do not restrict ourselves to any particular alloy, the object being to employ an alloy that will expand in the same or nearly the same ratio as the contraction of the material to be carbonized. The retort-lid D is securely fastened in place and serves to force the blocks C (one or more) in snug contact with the uppermost plate of the pile. A pipe, E, communicates with the lid, the outer end of the pipe extending into a body of water, F, and being sealed thereby. The retorts are placed in a furnace and subjected to a light heat, and the vapors and gases resulting from the carbonization of

the inclosed material are allowed to escape through the pipe E and into the body of water, the latter serving to prevent ingress of air to the interior of the retort. During the first stages of the carbonization the pieces or slabs A are rapidly reduced in bulk, while on the other hand the bulk of the blocks C is rapidly increased, owing to the expansive effect of the heat. Thus as the pieces A shrink and contract in size a corresponding increase in the size of the blocks C, owing to the expansion by the heat, operates to preserve an even and continuous pressure on the pile of slabs and prevent them from warping. As the operation proceeds, the shrinkage of the plates or slabs materially decreases, while a corresponding increase occurs in the expansion of the blocks, so that throughout the entire carbonization of the slabs or pieces A they are subjected to a practically even and uniform pressure throughout their entire surfaces, and thus the completed carbon plate is produced with flat and even sides, and, furthermore, a very slight percentage of broken plates results. When the pieces or slabs are comparatively dry before being introduced into the retort they may be placed in direct contact with each other, as illustrated in Fig. 2, and on the uppermost plate a layer of pulverized carbon is placed, while upon such layer is placed an iron or metal plate, F', which serves to support the blocks C. The coefficient of expansion and contraction of the alloy blocks and the slabs or pieces A is so nearly alike throughout the different stages of carbonization that it enables us by our improved process to produce carbon plates with perfectly flat sides and without the necessity for constant attendance, thereby rendering the process not only effectual, but economical in practice.

Instead of employing the blocks, we may use the form of apparatus shown in Fig. 5, wherein a follower, G, is employed, said follower being forced downward by the screw H as the carbonization proceeds.

It is evident that many slight changes may be made in the construction and arrangement of the parts composing the apparatus, and also, that deviations may be made in the steps of the process described; and hence we would have it understood that we do not limit our-

selves to the exact construction of apparatus or to the particular steps of the process described; but,

5 Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

10 1. An apparatus for making carbon plates, consisting of a closed retort, a follower located within the closed retort, and devices engaging said follower and lid or cover of the retort for subjecting the pieces or slabs to pressure during the process of carbonization, substantially as set forth.

15 2. An apparatus for making carbon plates, consisting of a closed retort having an escape-pipe provided with a liquid seal, of a follower located within the retort, and expansible pressure-blocks located between the follower and lid of the retort, substantially as set forth.

3. An apparatus for making carbon plates, 20 consisting of a closed retort, a follower-plate, and one or more blocks of metal alloy interposed between the follower and lid of the retort, substantially as set forth.

In testimony whereof we have signed this 25 specification in the presence of two subscribing witnesses.

EUSEBIUS J. MOLERA.
JOHN C. CEBRIAN.

Witnesses to signature of E. J. Molera:

F. O. W. CLEARY,
GEORGE COOK.

Witnesses to signature of J. C. Cebrian:

F. O. WEGENER,
LOUIS PROLL, Jr.