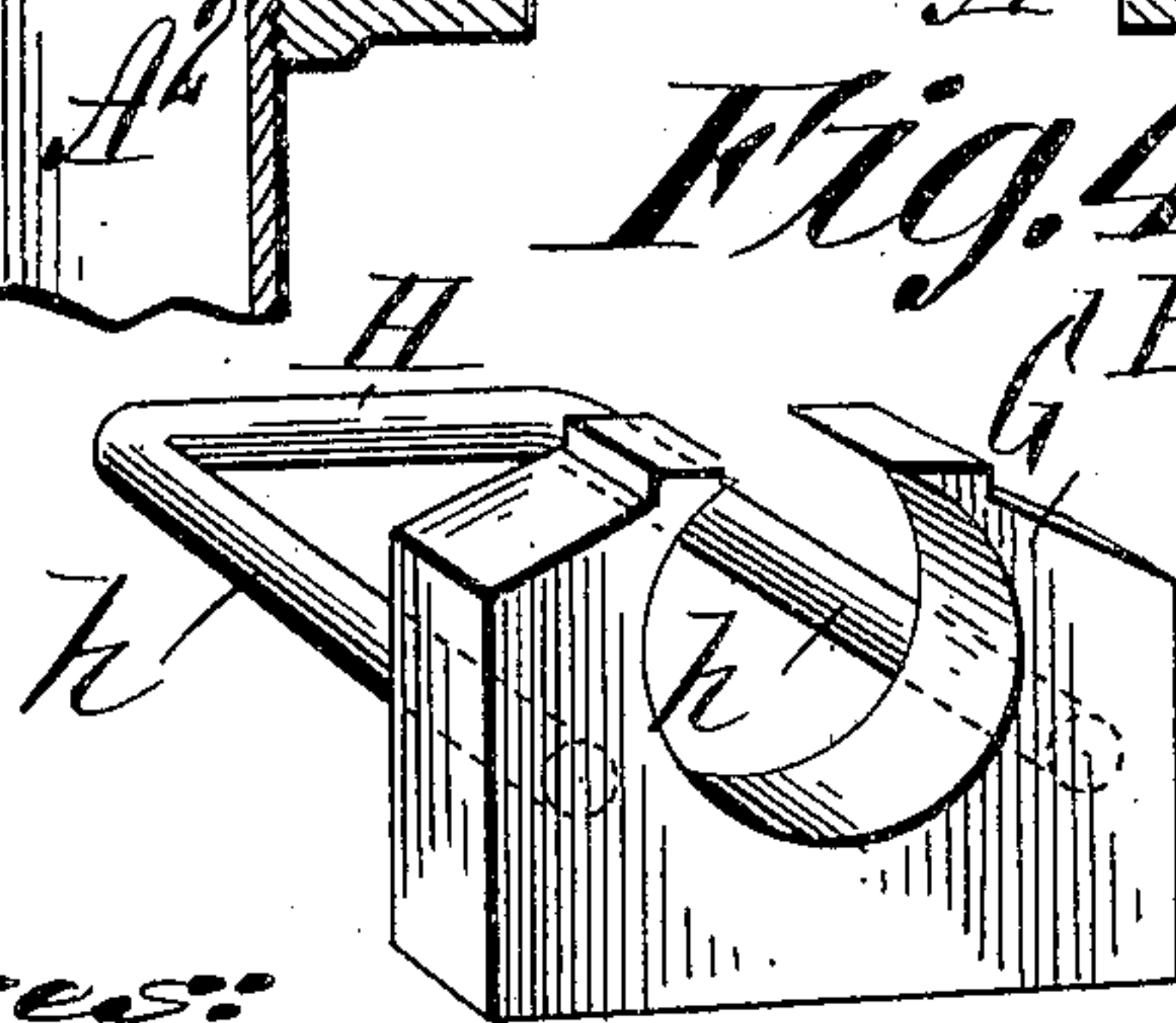
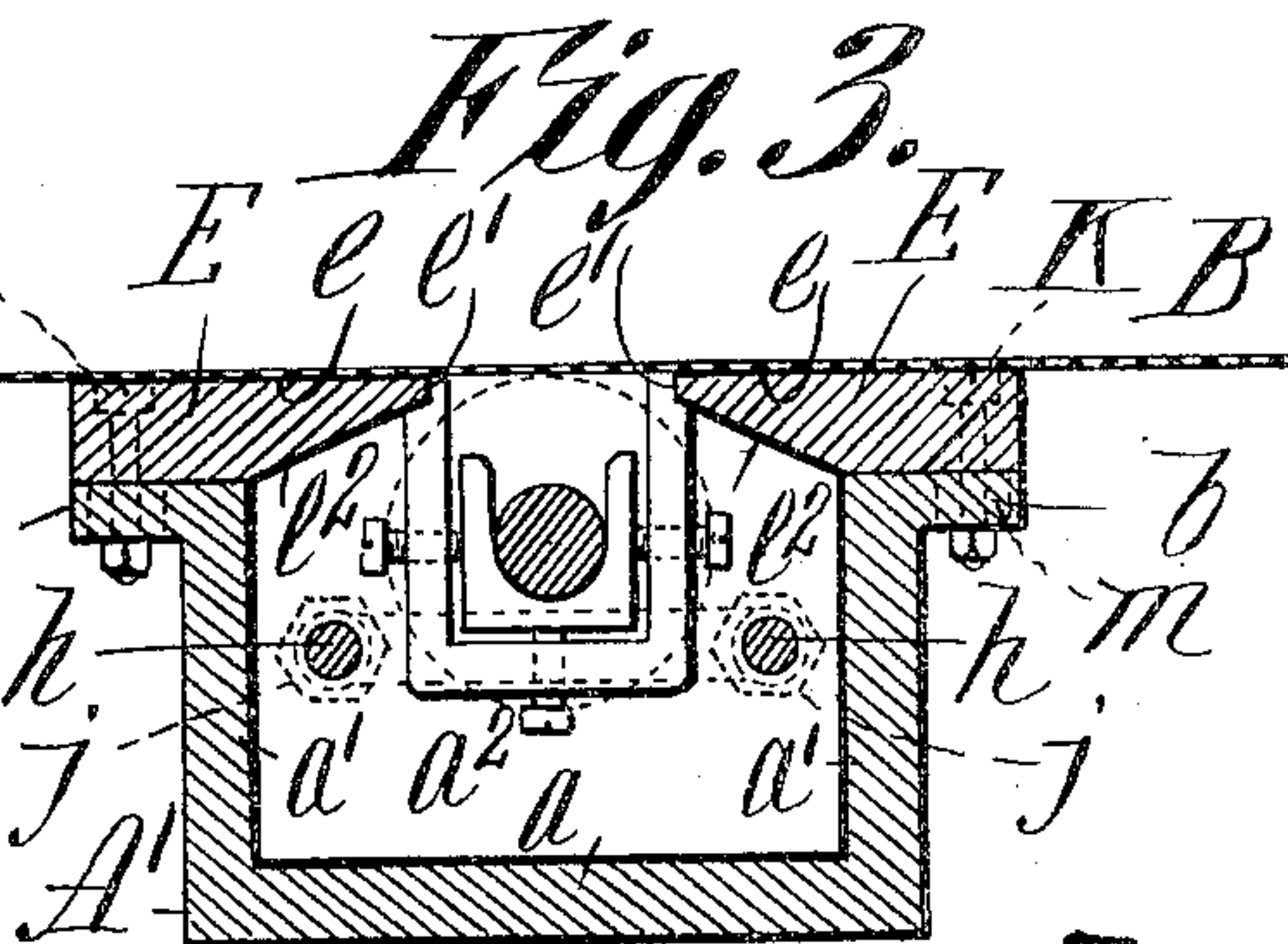
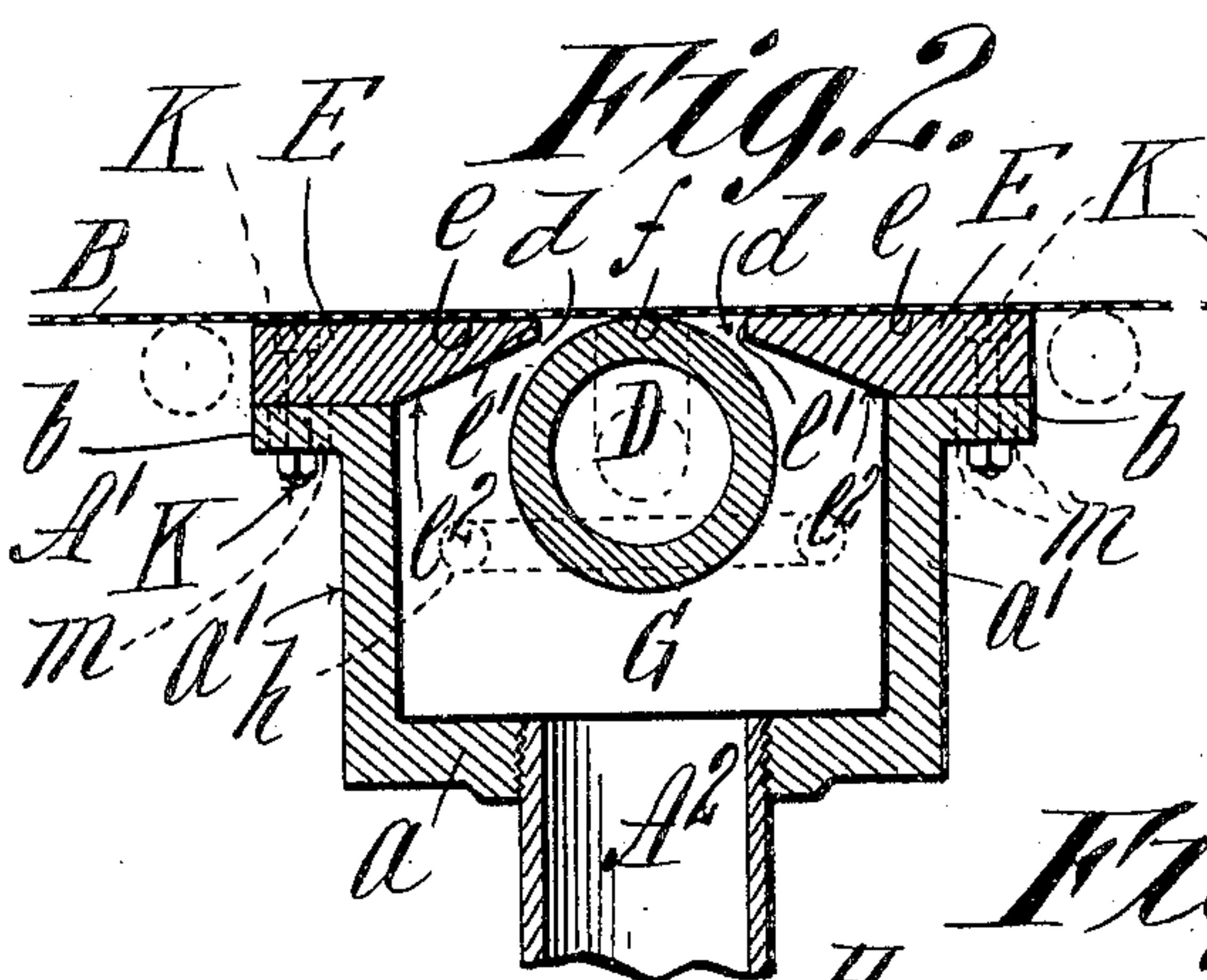
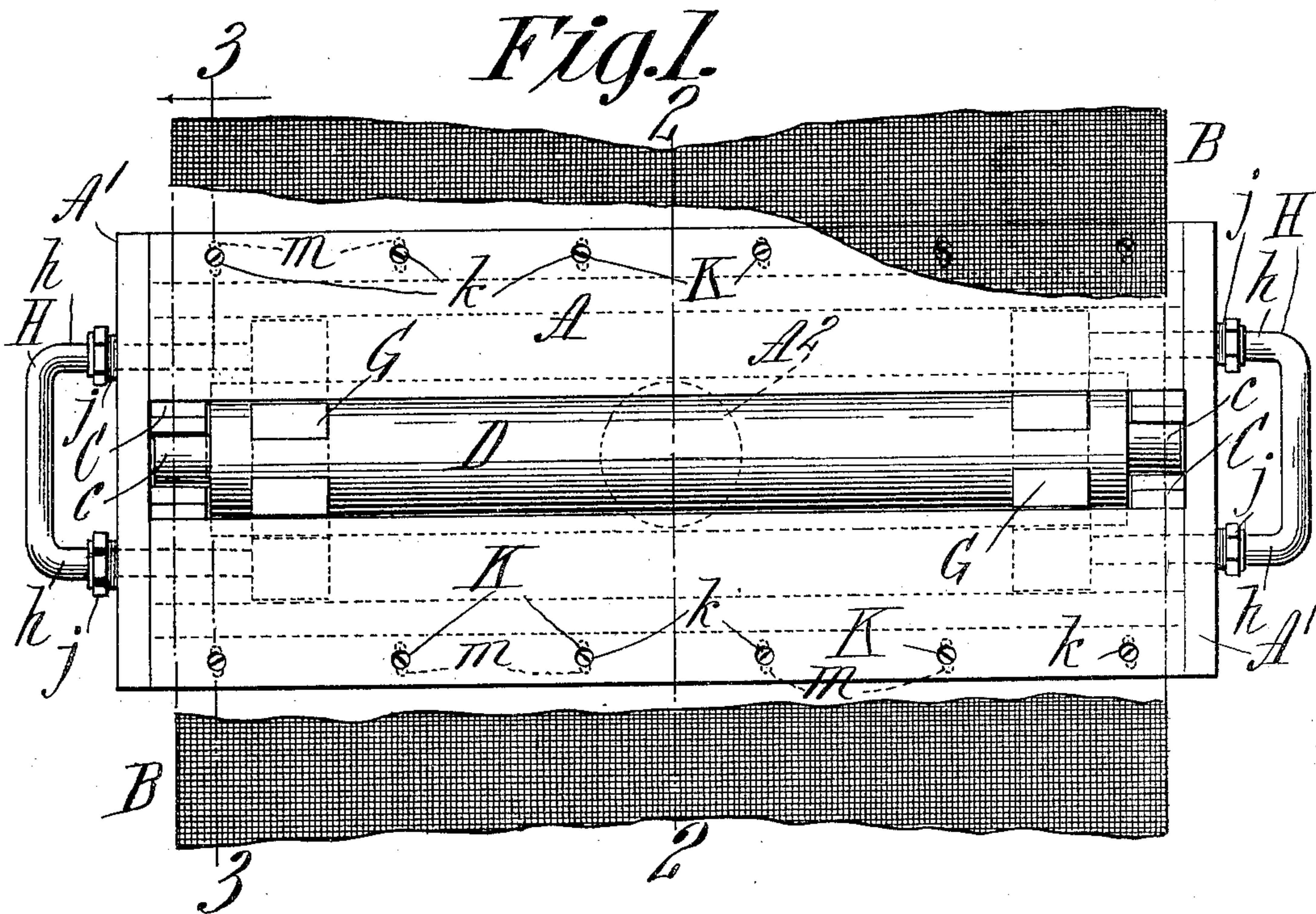


C. POTTER.
 SUCTION BOX FOR PAPER MACHINES.
 APPLICATION FILED JUNE 7, 1905.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES POTTER, OF HOLYOKE, MASSACHUSETTS.

SUCTION-BOX FOR PAPER-MACHINES.

No. 807,772.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES POTTER, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Suction-Boxes for Paper-Machines, of which the following is a full, clear, and exact description.

As well known in the manufacture of paper in Fourdrinier machines employing an endless wire-cloth apron which runs over one or more suction-boxes, large expense is necessitated in the frequent replacement of the endless apron or "wire," which becomes worn out sometimes in the course of only a few days, principally because of the abrasive effect thereon of the suction-box, over which it must continually pass. It has been proposed to employ instead of a suction-box having a flat continuous perforated top a box having an open top with a roll or rollers therein for the support of the wire-cloth apron. Such provisions have, however, been unsatisfactory and have not come into practical use, for the reasons that on account of the widths of the openings left between the roller or rollers and the upper edges of the suction-box walls the wire-cloth apron is permitted to sag, whereby increased, instead of lessened, friction and abrasion ensues and whereby efficient vacuum or suction conditions are precluded.

My object is to provide a suction-box having a roller extending along an upper opening therein and to provide top plates or walls having their upper surfaces substantially coincident with or tangential to the upper peripheral surfaces of the roll, having extensions from the sides of the box inward toward the roll, so that their inner edges are extended beyond vertical planes coincident with the sides of the roll, whereby while sufficient suction-spaces are left between the inner edges of said top plates and the roll for adequate suction action the spaces to be spanned between the inner edges of the top plates and the top peripheral portion of the roll are comparatively small, so that the wire-cloth apron in passing, under more or less draft and supported on the top plates and on the top of the roll between them, cannot sag, but, on the other hand, will run level and with the least possible destructive effect. The practical value of my improved suction-box is further increased by upwardly and inwardly beveled

formations of the top plates of the box, as will hereinafter more fully appear.

In the accompanying drawings, Figure 1 is a plan view of a suction-box with the wire-cloth apron which runs thereabove largely broken away. Fig. 2 is a cross-section of the suction-box, taken on line 2 2, Fig. 1. Fig. 3 is a similar cross-section, but as taken on a line 3 3, Fig. 1. Fig. 4 is a perspective view of one of the adjustable heads; and Fig. 5 is a cross-sectional view, on a larger scale, of the central and top portion of the suction-box as taken on the line 2 2, Fig. 1.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the suction-box, which will be usually of rectangular shape and of a length equal or slightly greater than the transverse width of the endless wire cloth or apron B, beneath the top run of which it is located.

The body portion A' of the suction-box A is preferably a one-piece metal casting of trough-like shape open at the top and having a flat horizontal bottom a , vertical side walls a' , and vertical end walls a'' . This body A', which is supported on the shaker-frame of the paper-machine, (not shown,) has formed on its end walls a'' the bearings C, in which are supported the journals c of the hollow metal apron-supporting roll D. This supporting-roll D, which extends lengthwise of the body A' from one end wall a'' to the other, is centrally located between the side walls a' . These side walls a' , whose top edges are somewhat lower than the top edges of the end walls a'' , have formed thereon the outwardly - extending flanges b , the flat top surfaces of which support thereon the horizontally - disposed top plates E. These plates E extend the entire length of the open top of the body A', their ends fitting closely against the top edge portions of the body ends a'' , and their flat and horizontally-extending top surfaces e are substantially tangential or level with the uppermost portion of the peripheral surface f of the supporting-roll D. These surfaces e and f are maintained in position against the under side surfaces of the top run of the Fourdrinier apron or wire B by suitable vertical adjustment of the suction-box at its point of support on the paper-machine frame. The widths of the top plates E, respectively, are in extent such that their separated and par-

allel edges e' are some little distance apart and are adjusted relative to the centrally-located supporting-roll D to form the long narrow openings or slits d between said roll and the edges of the plates. The under side portions of the plates E from their edges e' to about their places of attachment with the side walls a' are beveled, as shown at e'' in Figs. 2, 3, and 5. This beveling of the adjacent edge portion of the plates E permits of bringing the edges e' nearer to the surface of the roll D and of the forming of correspondingly narrower openings between their edges and the top longitudinal line on the roll D to be spanned by the traveling wire-cloth apron than would otherwise be possible, and yet a considerable and efficient width of suction-space remains open between each corner and the roll-surface. This slit-like top restricted opening thus formed on either side of the supporting-roll D affords a sufficient area for the downward suction of water from the wire-carried pulp web into the suction-box and thence through the suction-pipe A² of the vacuum-maintaining pump. (Not shown.)

It is of importance that the draft strain on the moving endless wire-cloth apron B be sufficient to preserve a perfectly level and even top surface, and it has been found that where a single suction-opening large enough in extent for the efficient drawing of the pulp web has been tried that in spite of excessive draft tension being applied to the wire or the provision of small supporting-rolls adjacent said opening a sagging or downward bending of the said moving wire as it passes over such suction-opening is caused by the strong suction or vacuum pressure necessary. This undulation of the wire not only has an injurious effect on the paper web during this stage of its formation, but very quickly wears out the fabric from which the wire is constituted. The employment of a centrally-located supporting-roll over the suction-opening, in conjunction with the bevel-edged plates, thus produces two openings having minimum top areas to be spanned, correspondingly reducing to a minimum the wearing action on the wire, and increases the life of the wire very materially.

A convenient means for adjusting the usual heads G is comprised in the sliding handles H thereof, the handle extremities h of which pass through holes J in the end walls a'' of the suction-box body and are attached to the heads G, as shown in Fig. 4, and stuffing-boxes j are provided in connection with the holes J. The operation of the heads G by the means described may be quickly and accurately accomplished.

An efficient means for adjusting the width of the suction-openings on either side of the supporting-roll D is provided in connection with the fastening screw-bolts of the top

plates E. These bolts K have slotted heads k , which are countersunk in the plates E, the slotted faces of these bolt-heads being flush with the surface of the plates. The flanges b of the suction-box body are provided with elongated holes m , which receive the threaded ends of the bolts K. An adjusting movement of the top plates F relative to the supporting-roll D may be had by the means described for the adaptation of the suction-box to different requirements, especially for regulating the thickness and weight of the paper to be made. It is to be understood that in adjusting the position of the top plates as described a corresponding reshaping of the top portion of the heads G is necessary, and an indication of an adjustment of the character above mentioned is constituted by the dotted lines in Fig. 5.

By having the shelf-like under-beveled tops of the box projecting inwardly toward the roller in an extent to overhang the convex opposite side portions of the latter, leaving, however, the two long spaces for suction adjacent the roll top and at each side of the median longitudinal line of the roll, it becomes assured that the running-wire will have ample supporting-bearings closely on the top members E E, as well as on the roll top, so that at the short spaces spanned by the wire there will be no sagging of the latter, and because of such complete contact of the wire on the supporting parts therefor the conditions for the effective vacuum or suction action will not in any degree be impaired.

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

1. For a Fourdrinier paper-machine, a suction-box, having a roll located and rotatable at the upper portion thereof, and having horizontal top plates arranged with their upper surfaces tangential to the top surface of the roll, and extending from the opposite box sides inwardly toward the roll beyond vertical planes coincident with the sides of the roll, but terminating in separation from the upper portion of the roll, and the wire-cloth apron having a running-bearing and supporting contact on the top plates and upper portion of said roll.

2. For a Fourdrinier paper-machine, a suction-box, having a rotatable roll located within the upper portion thereof, and said box having the top horizontal plates arranged with their upper surfaces substantially level with the upper peripheral portion of the roll extending from the opposite sides of the box into proximity, but edgewise separated from the roll, and formed with their under portions inwardly and upwardly beveled, substantially as and for the purposes set forth.

3. A suction-box, comprising an upwardly-open, trough-shaped, body, having a roll jour-

naled for rotation at the central upper portion thereof, and top members supported by the opposite edges of said body, adjustable toward and from the roll located between
5 them, having their upper surfaces in a plane substantially coincident with the upper surface of the roll, projecting to overhang, but edgewise separated from, the side portions of

the roll, and having their under surfaces upwardly and inwardly beveled.

Signed by me at Springfield, Massachusetts,
in presence of two subscribing witnesses.

CHARLES POTTER.

Witnesses:

WM. S. BELLOWS,
G. R. DRISCOLL.

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