

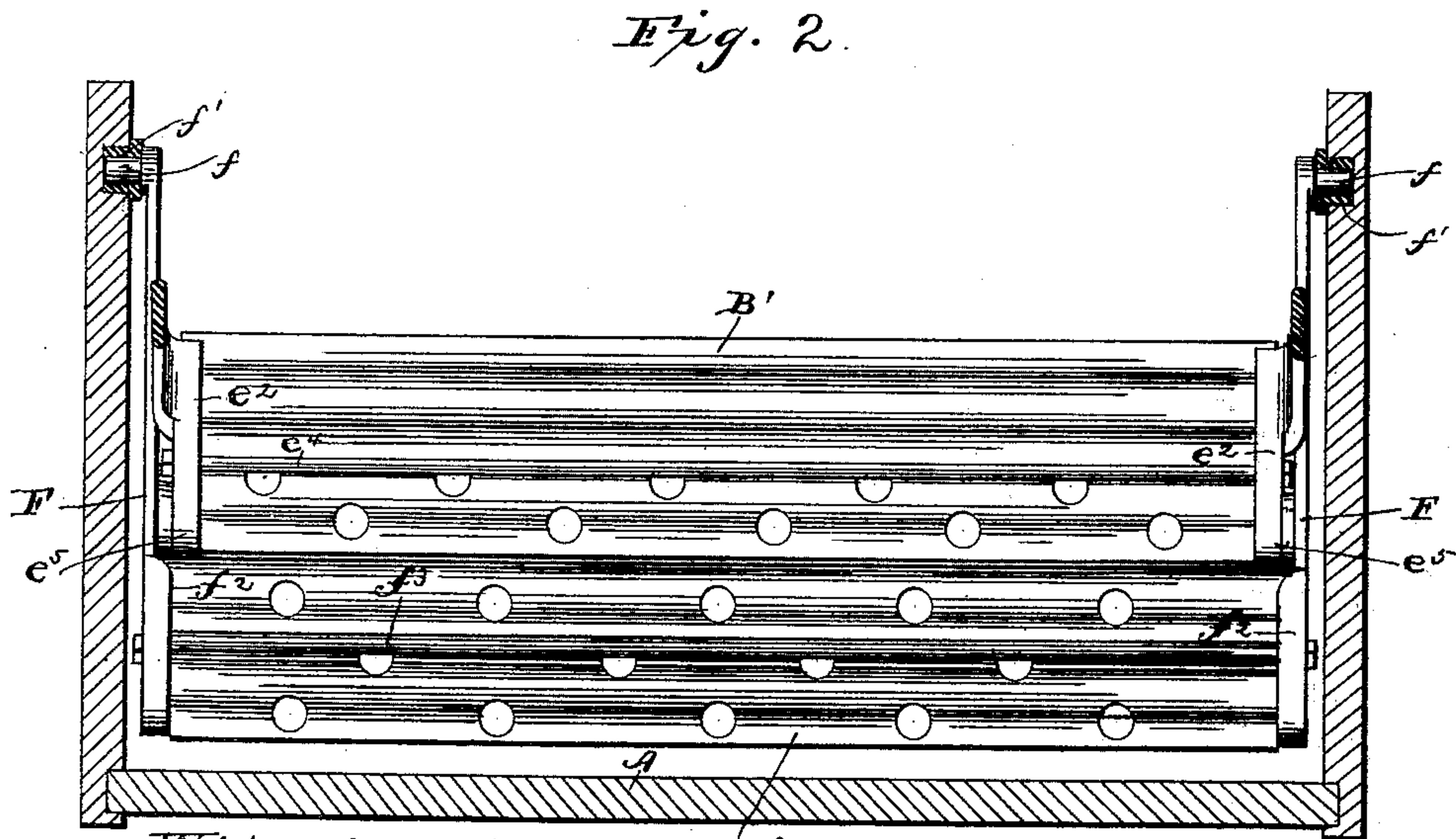
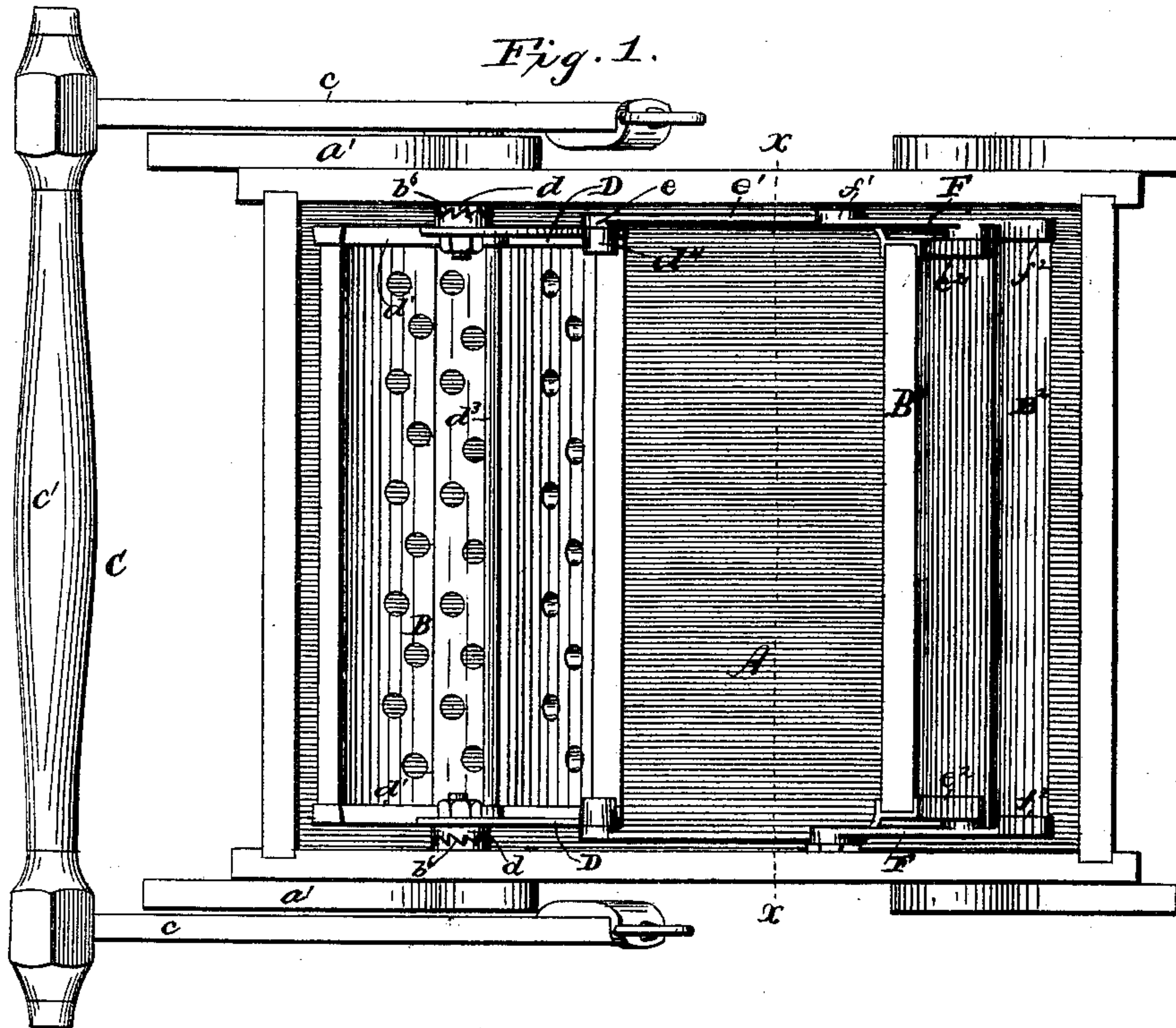
(No Model.)

2 Sheets—Sheet 1.

G. M. MILLER.
WASHING MACHINE.

No. 407,228.

Patented July 16, 1889.



Witnesses.
Chas. R. Burr.
Thomas Durant

Inventor.
George M. Miller.
by Church & Church
his Attorneys.

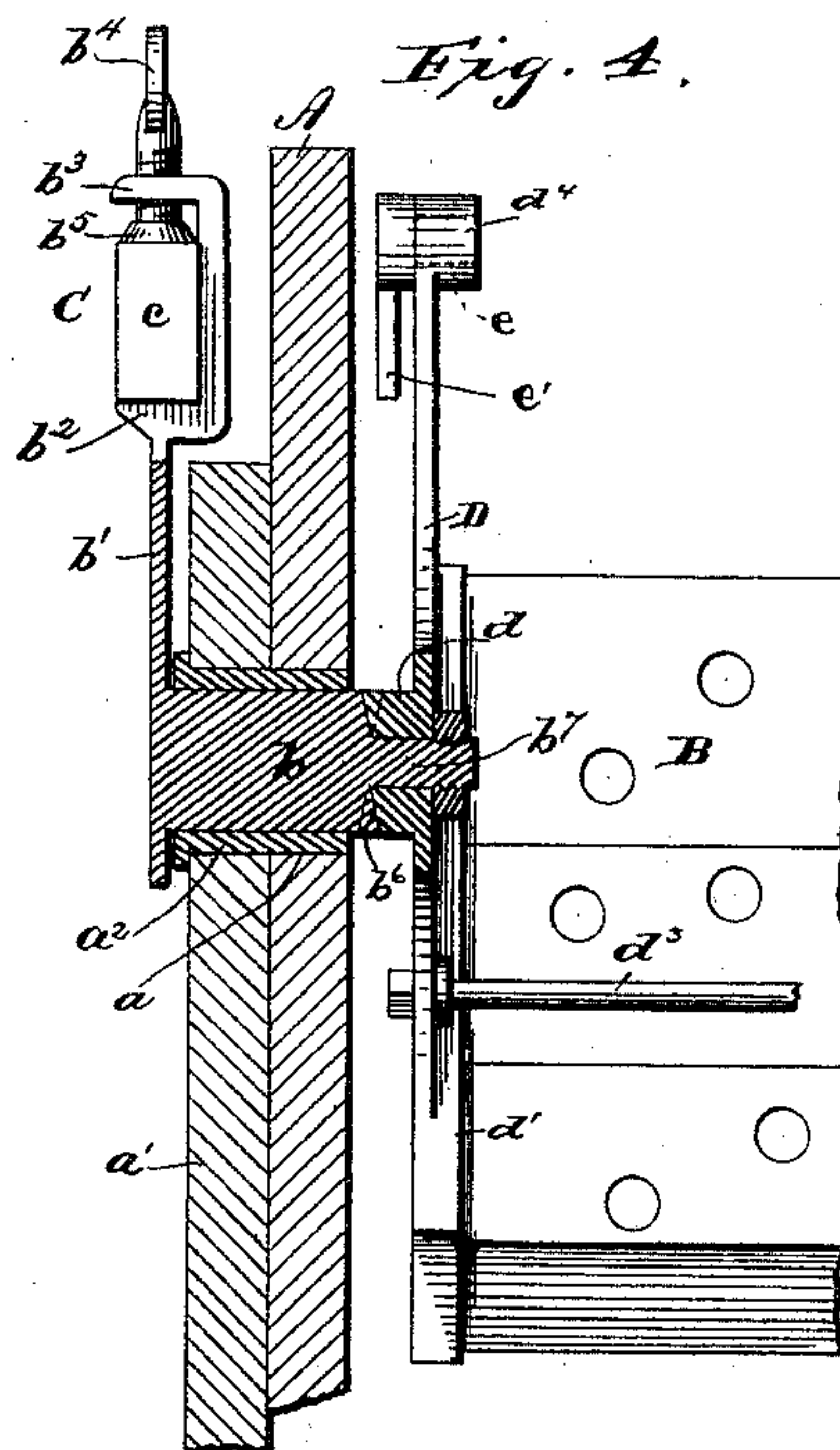
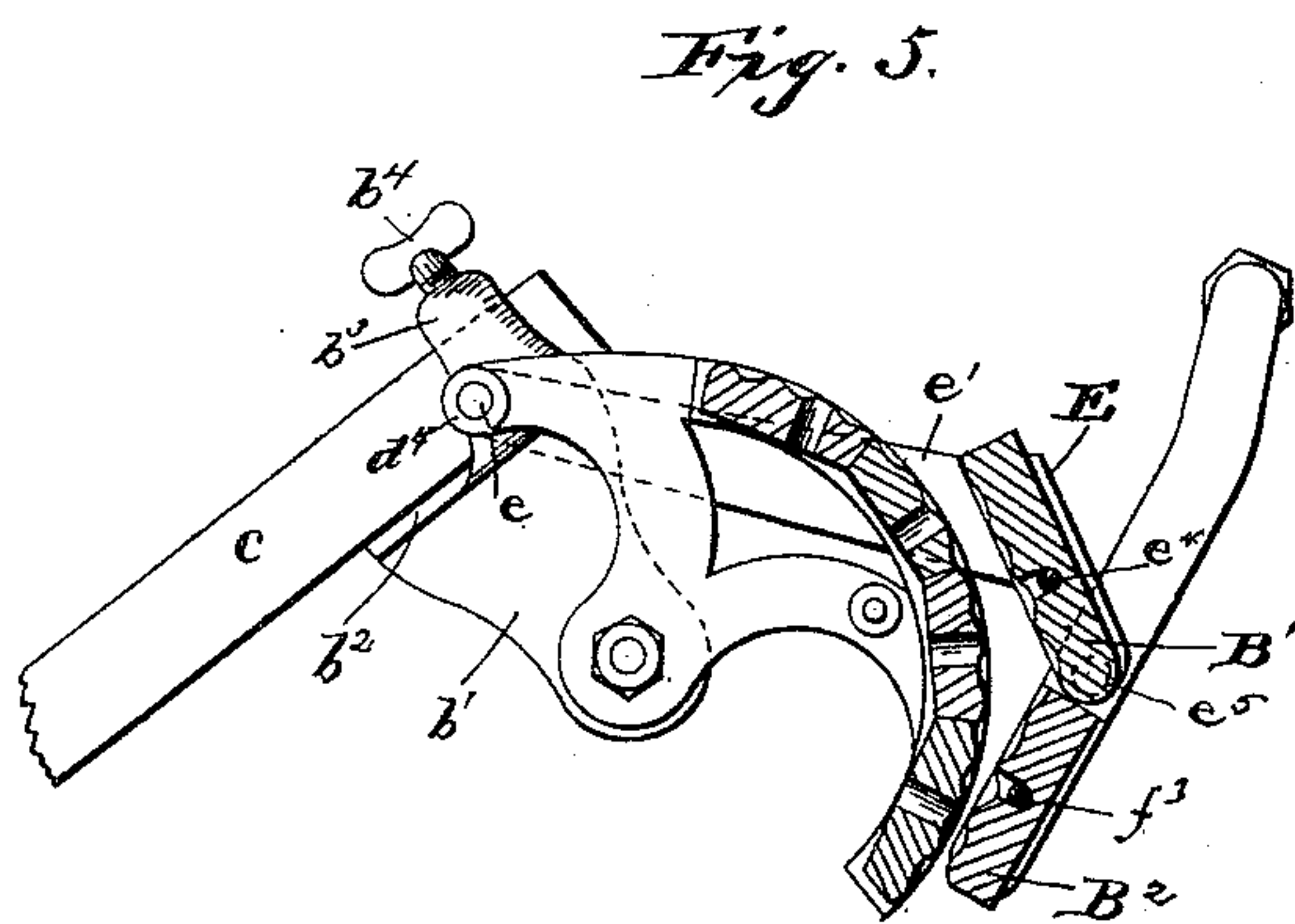
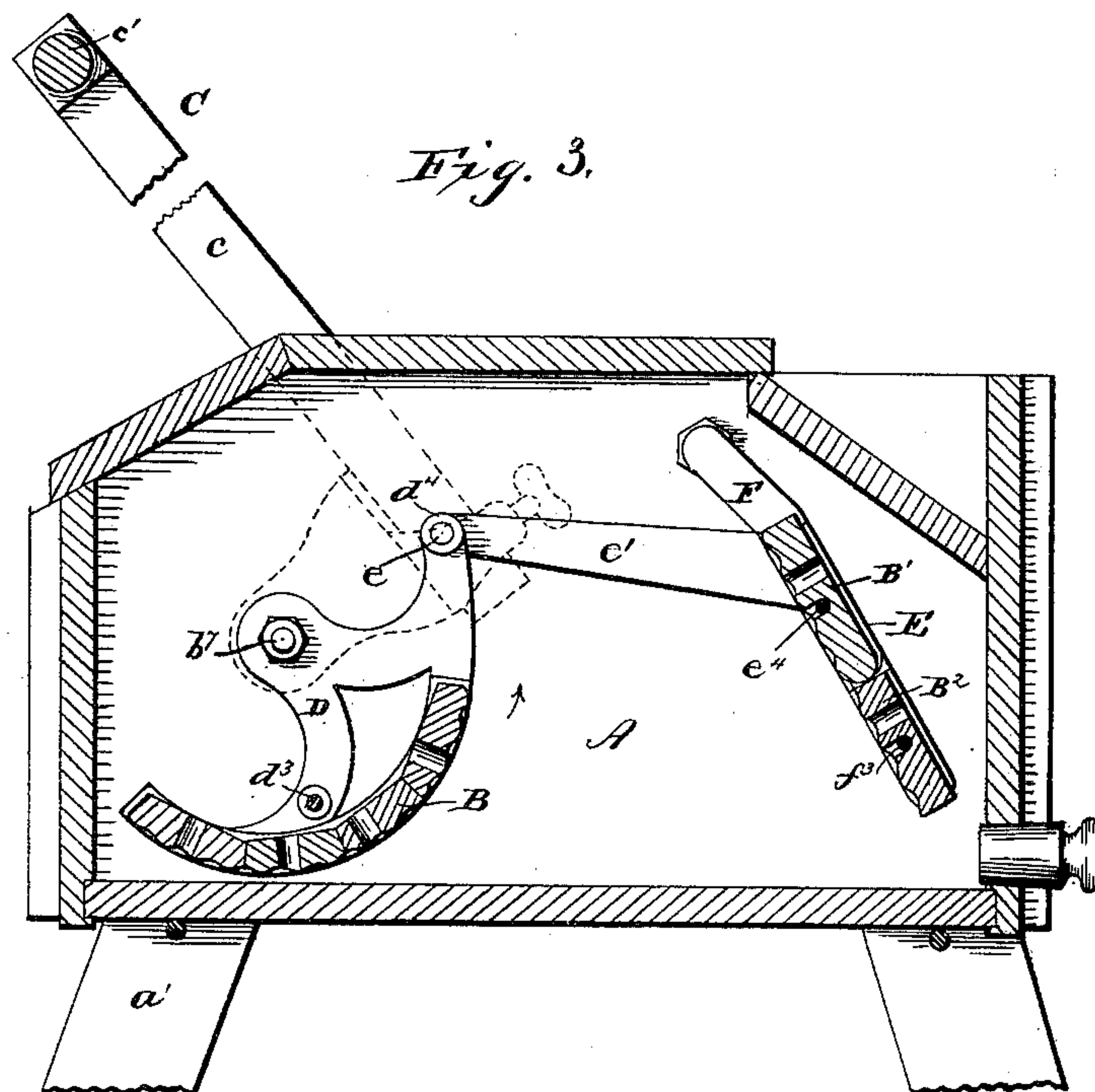
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UNITED STATES PATENT OFFICE.

GEORGE M. MILLER, OF YORK, PENNSYLVANIA.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 407,228, dated July 16, 1889.

Application filed October 24, 1888. Serial No. 289,019. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. MILLER, of York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Washing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to a class of washing-machines designed to operate upon the cloth or other material and cause a penetration or flow of the liquid through the fabric by pressure applied to the latter after or during immersion; and it consists in the novel combination, arrangement, and construction of parts, as hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, illustrating the application of my invention, Figure 1 is a top plan view of the machine, the cover of the box being removed. Fig. 2 is a transverse vertical section on the line *x x*, Fig. 1. Fig. 3 is a longitudinal vertical section through the machine. Fig. 4 is a detail view, partly in section, illustrating the construction of the brackets supporting one of the pressure-boards, and to which the operating-handle is secured. Fig. 5 is a detail view of the pressure-boards and their supporting-brackets removed from the frame, illustrating the action of the pressure-boards.

Similar letters of reference in the several figures indicate the same parts.

The letter A designates a tub, box, or other receptacle, of any desired or approved form, preferably provided with legs or standards. In the opposite sides of the box, near one end thereof, are formed coincident apertures *a*, preferably located opposite the legs *a'*, which latter are also perforated, and a thimble *a''*, provided with a collar, is inserted in each opening from the outside, thus forming bearings in the sides of the box for the reception of the pivots or pins *b*, upon which the pressure-board B is hung, and through which power is transmitted from the handle C to the operating parts within the box. The pivot-pins *b* are each formed upon or attached to an arm *b'*, standing at or about at right angles to said

pin, and provided with a shoulder or extended bearing *b''* and an overlying arm *b'''*, through which a clamping-screw *b''''* is threaded, said screw being preferably provided with a washer or swiveled head *b''''''*.

The handle C comprises two side bars *c*, united at their outer ends by a cross-bar *c'*, the lower ends of said side bars being received in the arms *b'*, resting upon the extended bearings *b''*, and held in adjusted position by the screw *b''''* or equivalent clamping devices. It will be obvious that as thus arranged the handle can be readily applied, removed, lengthened, or shortened by the proper manipulation of the thumb-screws *b''''*.

The pivot-pins *b* are each formed or provided on their inner ends with a shoulder *b''*, notched or corrugated on its face, and a stud or pin *b'''* for the reception and attachment of the side brackets D, between which latter the pressure-board B is secured. Each bracket D is provided with a boss *d*, perforated for the reception of the stud *b'''*, and having its face corrugated or notched to engage the correspondingly notched or corrugated shoulder *b''* of the pivot *b*. The lower portion of the bracket is or may be curved, as shown, and upon the inner face are formed flanges *d'*, between which the ends of the pressure-boards B are inserted and held, the ends of said boards being preferably shouldered or tenoned to fit snugly between the flanges.

The two side brackets D are united and the pressure-boards securely clamped and held in position by means of a tie-rod *d''*, threaded into said brackets or held thereon by nuts applied to one or both ends of the rod.

The relative position of the side brackets D and arms *b'*, to which the handle is secured, is maintained by means of the corrugated or grooved faces of the pivot-pins and bosses interlocking and held in engagement by the nuts on the ends of studs *b'''*. By this arrangement not only are the parts rigidly and securely connected in a manner to obviate all danger of looseness in joints, but provision is made whereby the angular position of the handle can readily and quickly be changed or adjusted, for by simply loosening the nuts on studs *b'''* the pivot-pins can be rotated more or less in the side brackets and again clamped tightly, thus rendering it possible for the op-

erator to adjust the handle to suit his height or swing it above in front or in rear of the box, as he may deem most expedient.

In each side bracket D is formed an eye or socket d^4 for the reception of a pin or journal e , formed upon or attached to the arm e' of one of the end plates E of the upper pressure-board B'. These end plates E are formed or provided with flanges e^2 on their inner faces for the reception of the ends of the pressure-board B', the latter being fitted between said end plates and the whole clamped and held firmly in position by a tie-rod e^4 . In order to secure the board B' in place without the necessity of providing end flanges, nails, or screws, the tie-rod e^4 is passed through said board, or preferably through a groove in the face thereof, as shown, thereby obviating the difficulties experienced in the use of detachable fastenings.

Each end plate E is furnished on the outside and near the lower end with a pivot or journal e^5 , which is received in a socket or eye formed in one of the swinging brackets F, supporting the lower pressure-board B².

The brackets F are each formed or provided at their upper end with a journal f , entering and taking a bearing in the side of the box, a thimble or socket f' being inserted in the side to afford a better and more durable bearing, and on the inner face of said brackets, near the lower end thereof, are formed flanges f^2 , for the reception of the end of the lower pressure-board B², a tie-rod f^3 passing through said board, and the brackets F, at opposite ends thereof, serving to clamp and hold these parts firmly and securely in position.

It will be observed that by the construction and arrangement described the swinging brackets of pressure-board B² are secured to the board and the whole clamped together and held in position within the box by the tie-rod and pivots formed in the brackets. The end plates of pressure-board B' are in like manner secured to the latter, and the two sets of journals—one engaging the brackets D and the other the swinging brackets F—are held and maintained in operative position by the tie-rod, and in like manner a tie-rod serves to hold the brackets D and pressure-boards B rigidly connected, thereby dispensing with a multitude of screws, bolts, nails, &c., such as are commonly employed in machines of this kind.

The operation of the machine is as follows: The handle being adjusted for either a downward, upward, or a back-and-forth motion over the top of the machine, (by setting the pivot-pins in proper relation to the pressure-board B and tightening up the fastening devices, so as to render the handle-pivots, brackets, and presser-board practically one piece,) a sufficient quantity of liquid is placed in the box and the handle operated to hold the presser-boards apart, as shown in Fig. 3. The fabrics to be washed are now introduced between the presser-boards, after which the

handle is reciprocated, imparting a short oscillating motion to the presser-board B about its pivotal points of support. As the board B is moved in the direction of the arrow, Fig. 3, it draws forward the upper pressure-board B', connected thereto by the pivots in its arms, and at the same time, through the pivotal connection between the end pieces of said presser-board B' and the brackets of presser-board B², it draws the latter forward. During this movement presser-board B² swings in the arc of a circle in the journals f , while the presser-board B', although partaking of this motion by being pivoted upon and carried by the brackets F, is given a downward movement in addition, as its pivotal point of attachment to the presser-board B is drawn backward and downward, as shown in Fig. 5. As these movements take place, the fabrics, which were previously introduced between the presser-boards while held at opposite ends of the box, are gathered up within the space between the approaching surface of the three boards B B' B², and subjected to the direct pressure of said boards, the boards B' and B² moving, practically, together as a single board during a portion of the operation, and as they approach more nearly the board B the upper board B' is forced down with great power upon the fabrics while the latter is held between the boards B B². When the handle is moved in the opposite direction to separate the presser-boards, they swing back, so as to entirely release the fabric preparatory to again applying pressure, as before.

The surfaces between which the fabrics are grasped are termed "pressure-boards," because they are designed to operate not as rubbing or scrubbing media, such as will rend and tear the fabrics, but rather by pressure to cause the liquid to penetrate and be carried or forced through the fabrics, thereby subjecting every part and portion to the cleansing action of the liquid.

It is to be remarked that the box is penetrated for the accommodation of the mechanism at two points only—that is, where the pivot-pins enter, and, further, that said pins, as well as the journals or pivots of the brackets F, are held in place on the sides of the box, thereby dispensing with the use of pins, screws, &c. Moreover, the thimbles, which are inserted in the sides of the box merely to afford more durable bearings, are furnished with collars and held in place by the brackets or arms carrying the pivots which take bearings in said thimbles.

The several pressure-boards B B' B² are perforated and their faces provided with grooves or ribs, as shown, to permit the escape or passage of the liquid expressed from the fabrics.

By simply loosening the fastenings applied to the several tie-rods the pressure-boards, together with their attachments, can be readily removed, and by loosening the fastenings on pivot-pins b and removing the handle the

whole operating mechanism can be withdrawn from the box.

As is obvious, the pivots or journals attached to the end pieces supporting the board B' and engaging sockets in the bracket-supports of boards B and B² may, if desired, be replaced by sockets and the journals formed on the said brackets.

Having thus described my invention, what I claim as new is—

1. In a washing-machine such as described, and in combination with the box thereof, the pivot-pins inserted through openings in the sides of the box, removably connected to the presser-board on the inside and provided with laterally-projecting arms formed integral therewith on the outside, and having a shoulder and overhanging portion carrying a thumb-screw, and the handle uniting said pivot carrying arms and secured thereto by the thumb-screws, as and for the purpose set forth.

2. In a washing-machine of the character described, and in combination with the box thereof provided with coincident openings for the insertion of the pivots, the flanged thimbles open at both ends inserted from the outside in said openings, the pivots bearing in said thimbles each removably connected to the presser-board on the inside and provided with a laterally-projecting arm on the outside, formed integral therewith and having a clamp, and the handle secured to said arms by the clamping devices thereon to retain the handle in position and hold the pivots and thimbles in place in the sides of the box, substantially as described.

3. In a washing-machine such as described, the combination, with the box having coincident openings in its sides, of the pivots projected through said openings and provided with arms to which the handle is secured, and the brackets carrying an oscillating member of the washing mechanism, said brackets being detachably secured to the inner ends of the pivots and held from rotary movement by the corrugated or notched surfaces, permitting adjustment of the handle, substantially as set forth.

4. In a washing-machine such as described, and with the box thereof provided with bearings in opposite sides, the pivot-pins secured to and connected by the handle and projected through the bearings in the sides of the box, the inner ends of said pivot-pins being provided with a shoulder having radial shoulders or corrugations and a stud or pin, the brackets supporting the oscillating pressure-board provided with a series of shoulders or corrugations fitting those on the pivot-pins, and fastening devices for clamping said brackets onto the pivot-pins, as set forth, whereby the handle can be adjusted with relation to the pressure-board and held rigidly in position.

5. In a washing-machine, the combination, with the sides of the box and the legs, perforated as described, and the thimbles inserted

through said openings and forming coincident bearings extending through one leg and the side of the box on opposite sides of the latter, of the curved presser-board secured to brackets attached to the opposite ends of said board and each provided with a boss perforated and having radial ribs or corrugations formed on its outer face, two pivot-pins inserted from the outside through the thimbles and each provided with a shoulder notched or corrugated on its inner face and a stud, the latter entering the perforation in the boss on one bracket and clamped thereto by a nut, an arm rigidly secured to each pivot-pin, and a handle provided with two side bars, each of the latter being clamped to one of the pivot-arms, substantially as described.

6. In a washing-machine, and in combination with the box and a swinging pressure-board, a bearing formed in the side of the box, a pivot-pin inserted through said bearing, its inner end detachably and adjustably fastened to the swinging pressure-board, while the outer end is provided with an arm formed with an extended bearing, an overlying flange and a thumb-screw, and a handle-bar resting upon said extended bearing and held in position thereon by the thumb-screw, substantially as described.

7. In a washing-machine such as described, the combination, with the board B, suspended upon pivots to oscillate back and forth, of a swinging board B², also suspended from pivots, and the pressure-board B', pivotally attached to and connecting the swinging boards B B², substantially as described.

8. In a washing-machine such as described, and in combination with the box and the pressure-boards pivotally supported at or near opposite ends of said box, the pressure-board B', pivoted to the supports of one of said swinging boards at a point intermediate the board and its pivotal point of suspension, and arms attached to said board B' and loosely attached to the opposite swinging board B, substantially as and for the purpose set forth.

9. In a washing-machine, and in combination with the box thereof and the pressure-board B, pivotally supported therein near one end, the opposite pressure-board B², supported in brackets applied to the end thereof and furnished with pins or journals projected into bearings formed in the sides of the box, and the pressure-board B', provided with end plates, which are each furnished with a pivot engaging a socket in one of the supporting-brackets of board B², and an arm connected to the frame of the pressure-board B by a loose connection, substantially as described.

10. In a washing-machine, and in combination with the box, the pressure-board B, provided with brackets at the ends, which latter are detachably and adjustably secured to pivots projecting through openings in the side of the box, the end plate carrying board B', provided with arms detachably and loosely attached to the brackets of board B, said end

plates being also loosely and detachably connected to the swinging brackets of the opposite pressure-board B², substantially as described.

- 5 11. In a washing-machine, and in combination with the box and the pressure-boards B B' B², arranged and co-operating substantially as described, the brackets D, detachably secured to pivots *b* and board B, the brackets
10 F, provided with journals fitting bearings in

the sides of the box and detachably secured to board B², and the end plates E, provided with pivots engaging brackets D and F and detachably secured to board B', substantially as described.

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Witnesses:

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