

(No Model.)

2 Sheets—Sheet 1.

A. M. DOLPH & J. H. SLACK.

CENTRIFUGAL EXTRACTOR.

No. 309,826.

Patented Dec. 30, 1884.

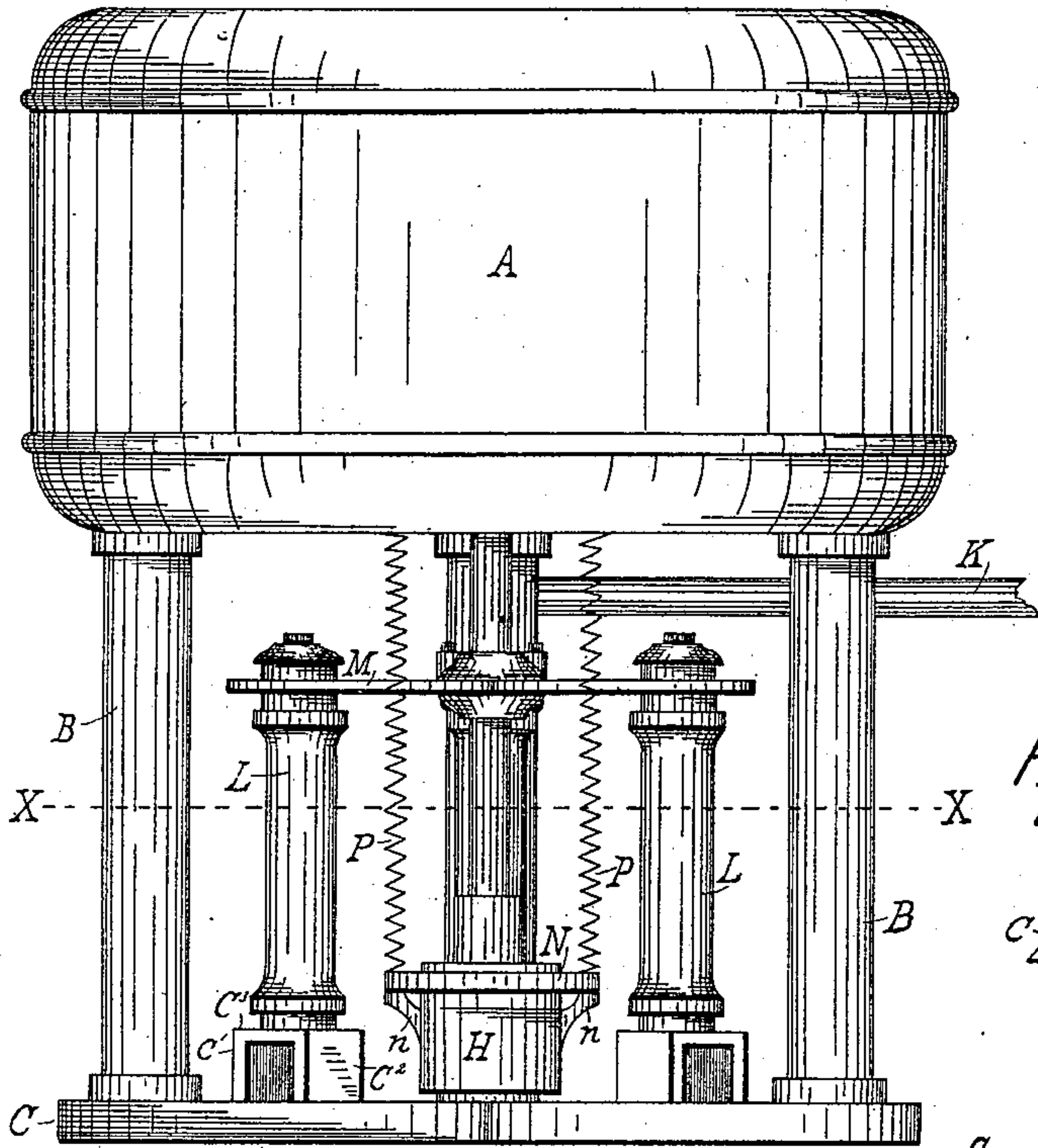


Fig. 1.

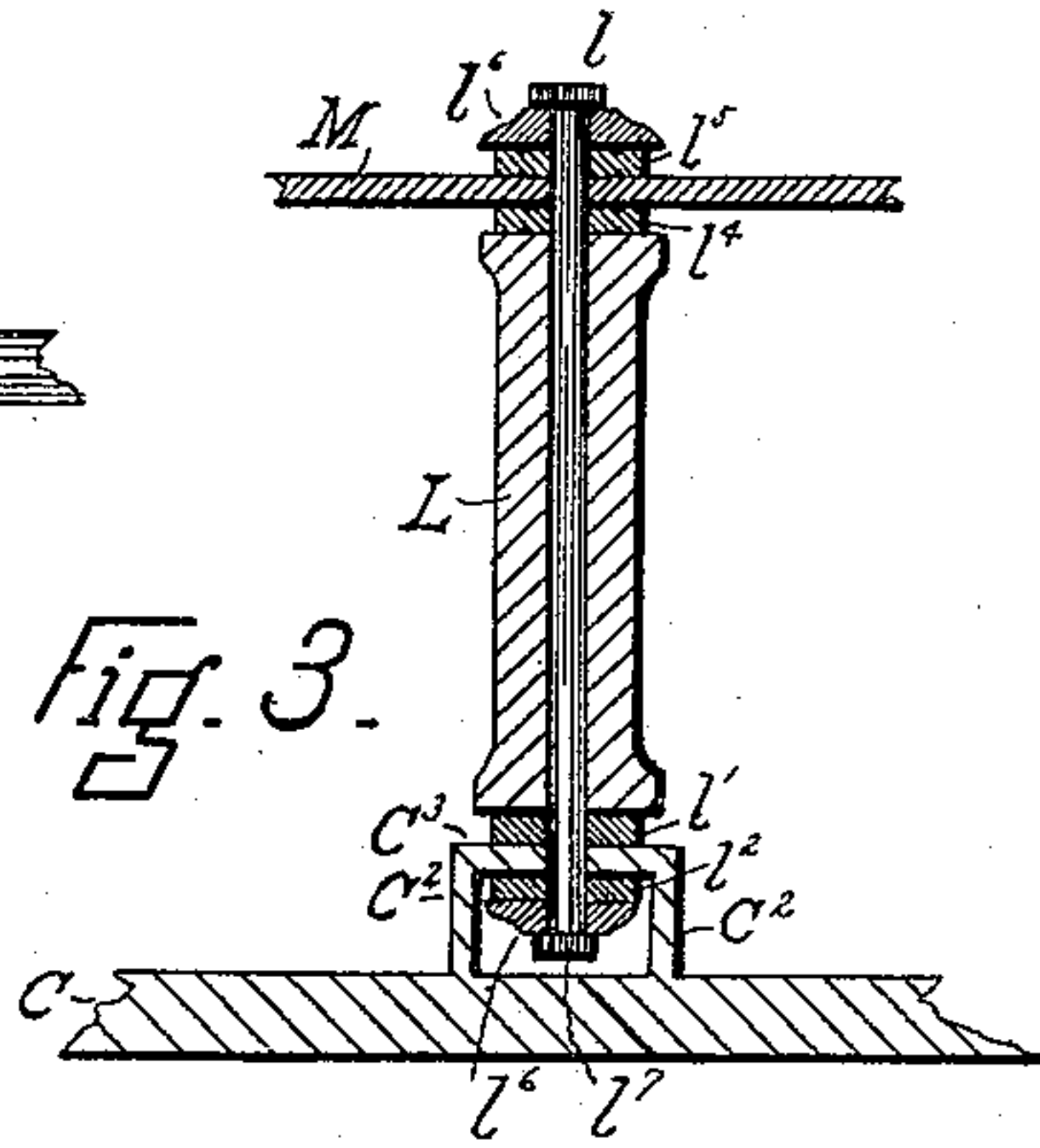


Fig. 3.

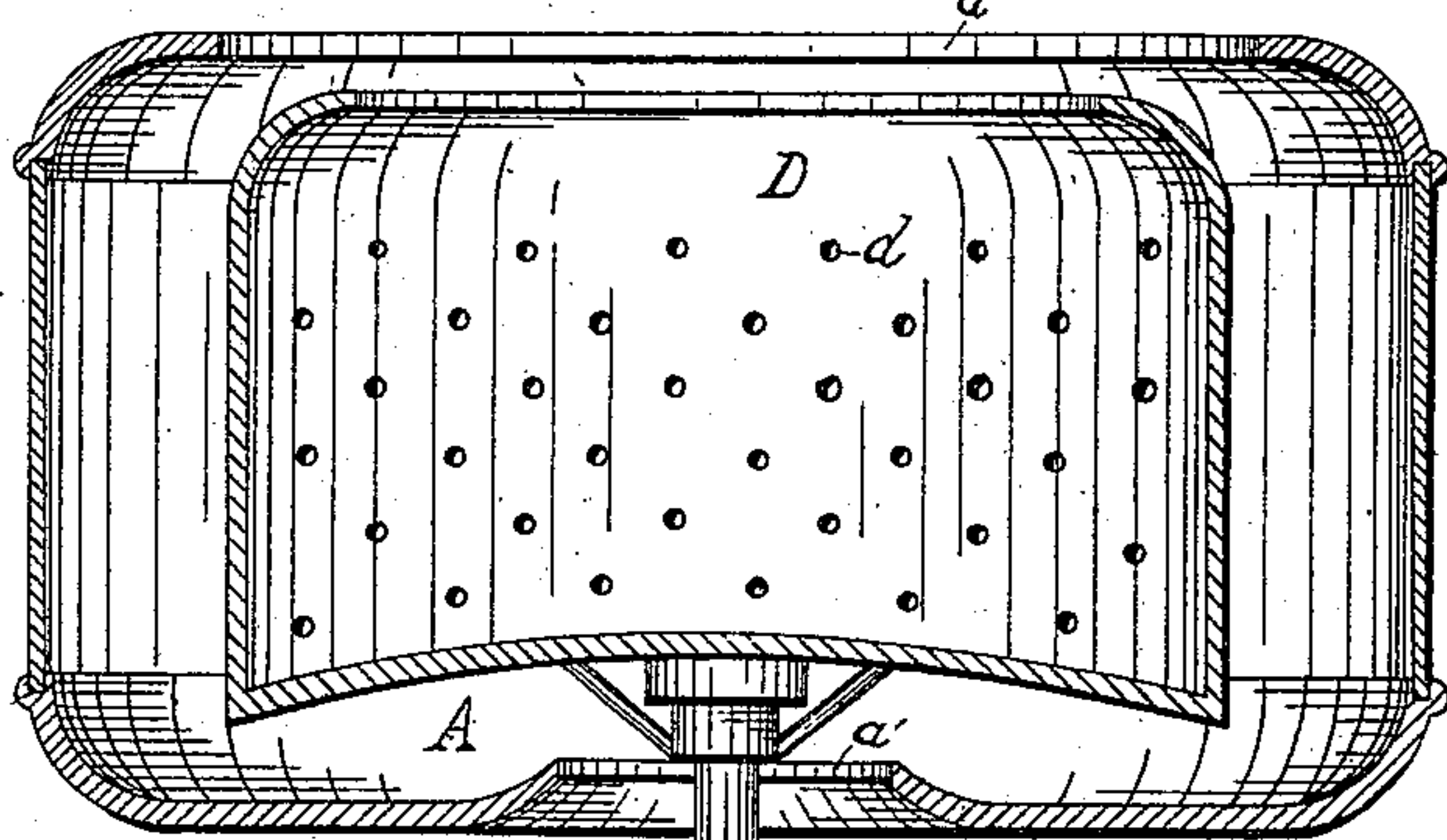


Fig. 2.

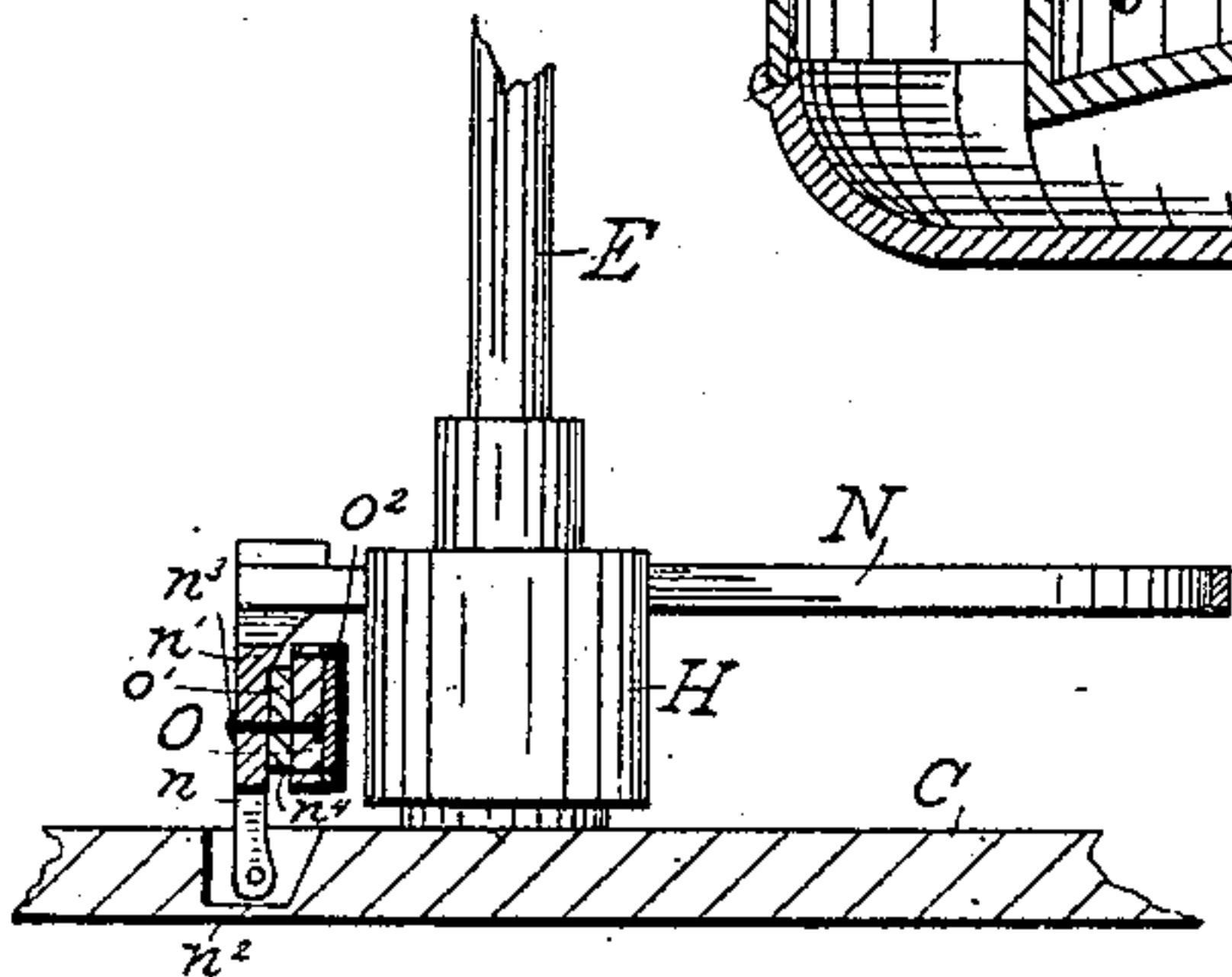


Fig. 6.

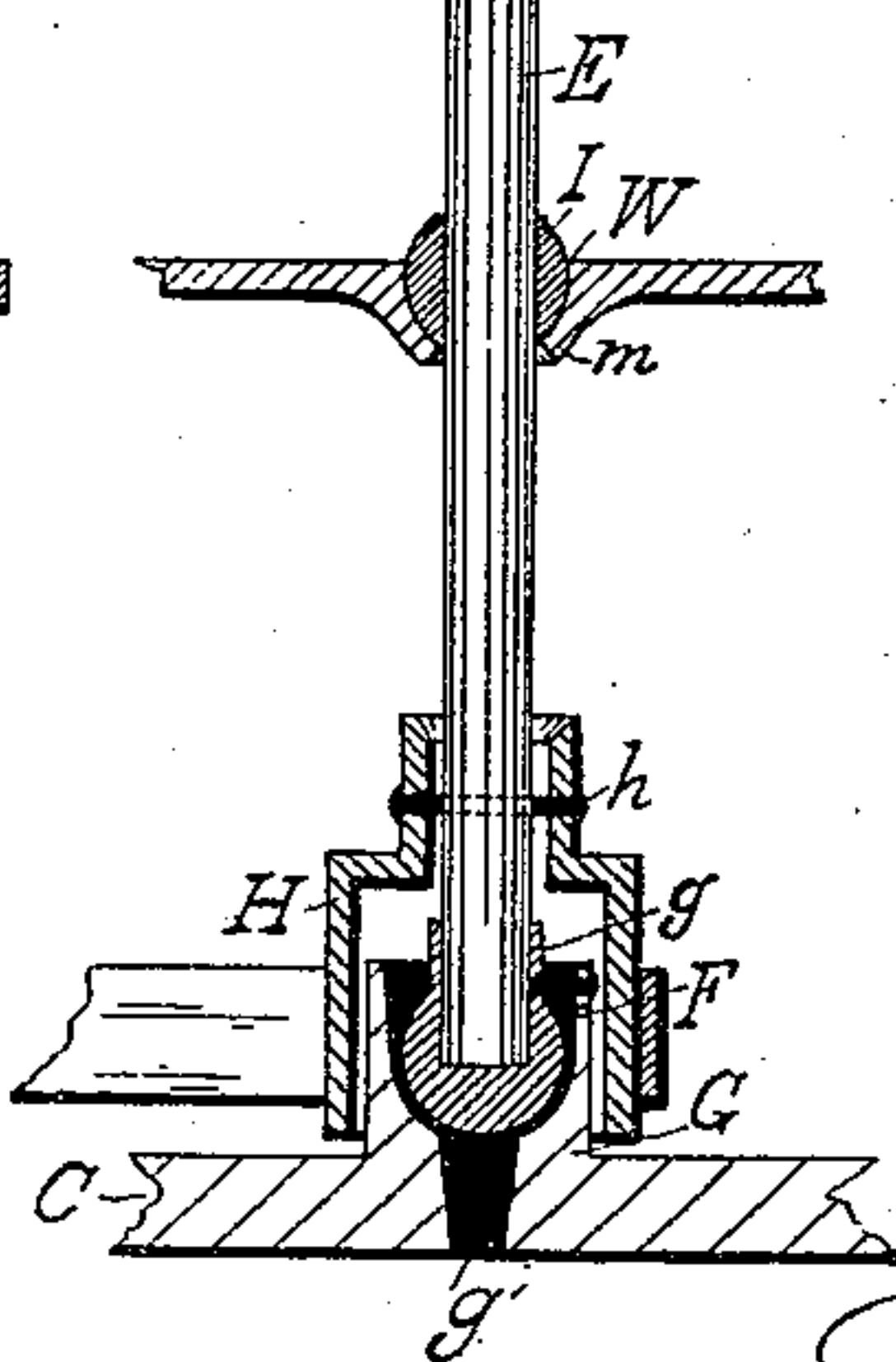


Fig. 7.

Attest
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O. M. Hill

Inventors
Alexander M. Dolph
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(No Model.)

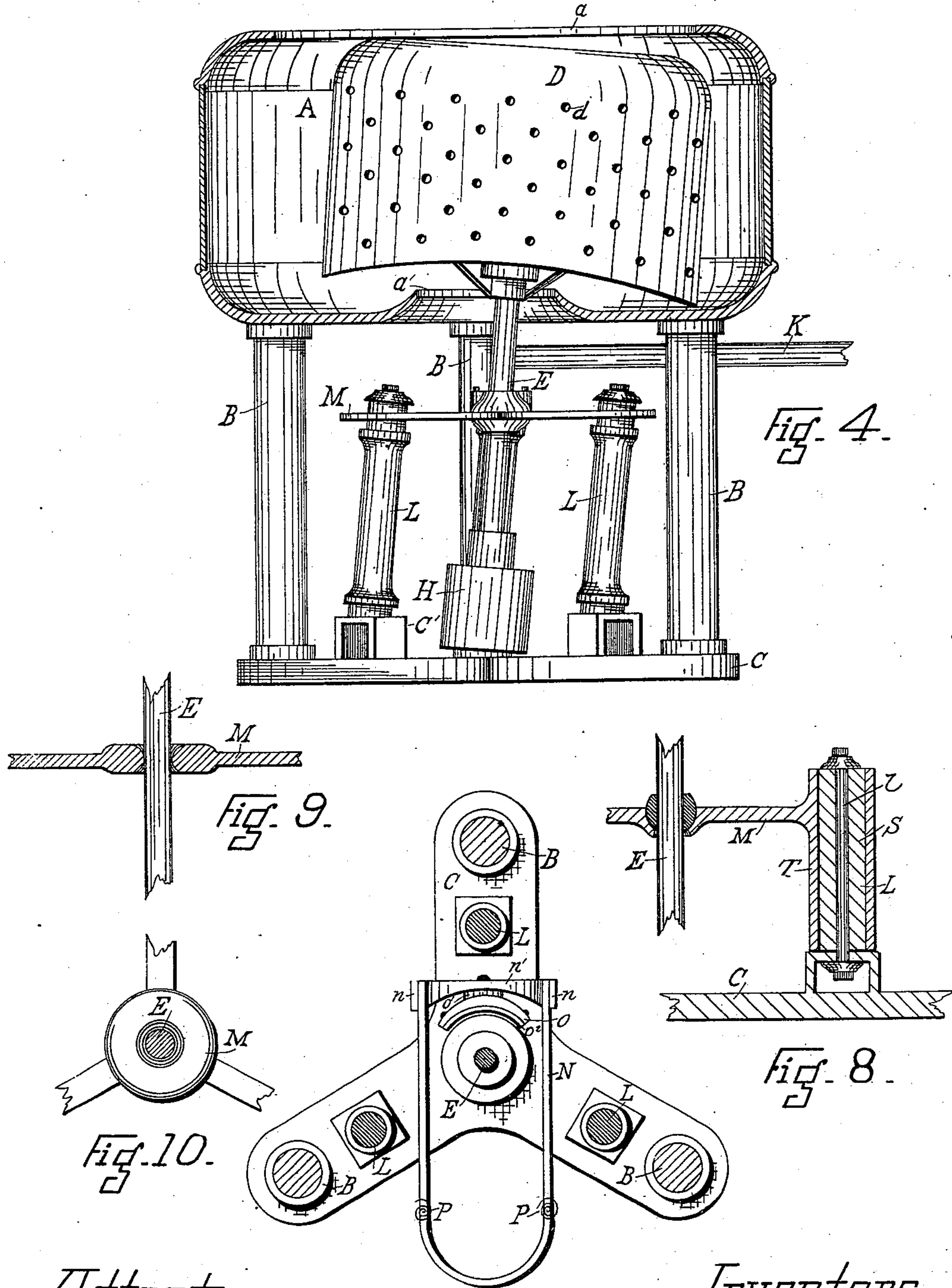
2 Sheets—Sheet 2.

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Fig. 5.

Inventors—

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UNITED STATES PATENT OFFICE.

ALEXANDER M. DOLPH AND JOHN H. SLACK, OF CINCINNATI, OHIO.

CENTRIFUGAL EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 309,826, dated December 30, 1884.

Application filed January 14, 1884. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER M. DOLPH and JOHN H. SLACK, both residents of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Centrifugal Extractors, of which the following is a specification.

Our invention is useful in the extraction of various liquids from substances—as, for example, molasses from sugar, honey from its comb, water from clothes, and in this last connection is useful and valuable as a clothes-wringer in laundering clothes and similar articles.

The various features of our invention and the advantages resulting from their use, conjointly and otherwise, will be apparent from the following description and claims.

In the drawings accompanying and forming part of this specification, Figure 1 represents a front view of our machine in elevation. Fig. 2 is a central cross-sectional view of the curb, basket, and of the immediate connections of the central rod or shaft which supports the basket, the said rod being shown in elevation. Fig. 3 is a vertical central section of one of the oscillating standards. Fig. 4 shows the relative positions which the curb and basket may assume in consequence of the rapid rotation of the basket. Fig. 5 is a plan view of all that part of our machine which lies below a horizontal plane passing through the line x of Fig. 1. Fig. 6 shows in longitudinal central sectional elevation the details of a portion of the brake. Fig. 7 is a side elevation of a portion of the rotating shaft E and its journal-bearing, and also the external box which carries the journal-bearing. Fig. 8 represents a vertical central section of a standard, illustrating a modified construction of said standard and its connection with the plate or arms connecting these standards to the shaft. Fig. 9 represents a vertical central section of a modification of the connection between the rotary shaft carrying the basket and the arms supported by the yielding standards. Fig. 10 represents a top view of the modification shown in Fig. 9.

A indicates a curb mounted on several—preferably three—firm standards, B, which are in turn securely and rigidly attached to a base-plate or other equivalent firm foundation, C.

Within the curb A is the basket D, which is enough smaller in all directions to permit it to freely oscillate within the said curb. This basket D is mounted on and rigidly attached to the oscillating rotating shaft E. The longitudinal axis of this shaft and the vertical axis of the basket are concentric. This shaft is provided with a journal-box or step, F, preferably located at the lower extremity of the shaft. This journal or end bearing-box is preferably approximately globular in form, as shown, and may oscillate in its bearing. It is preferably of cast-iron, turned with a hole, g^2 , for the end of shaft to fit into and revolve in. There are preferably several steel washers present in the bottom of this hole and lying loosely therein. The part F (journal-box F) does not revolve, but is kept from revolving by a pin, K, in its side, which fits into a vertical slot in its surrounding box G. The journal-box F is, however, made to oscillate and take the same oscillating motion as the shaft has. It is cast around with Babbitt metal, making a ball-socket joint for oscillation only. A box-bearing or step, G, is cast with or otherwise attached to the plate C, and has its interior hollowed out preferably in the form of a cup-shaped depression, g . The depression g is sufficiently wide at the top to allow the upper end of the shaft and journal-bearing F to freely oscillate, and to allow the side of the lower portion of the shaft or the upper end of the journal-box F, when the latter is continued up, to be out of contact with the sides of said depression. A sleeve or hollow pulley, H, attached to the shaft E, surrounds the box or bearing G, sufficient space being left all around the bearing G and between it and the pulley to permit the free oscillation of the shaft E. Higher up on the shaft E a sleeve, I, preferably exteriorly globular or rounding, encircles the shaft E. The basket D is open at the top, and is provided with the usual numerous small orifices, d , to permit the liquid to be extracted from the wet clothes, or from whatever may be in the basket, to pass out from and through the basket into the curb A. The curb A has, as is usual, a large circular opening, a , at the top, and a smaller circular opening, a' , at the bottom. The edges of this latter opening a' are turned up, and

through it the rotatory and oscillatory shaft E passes. One of the standards B is hollow, and forms an outlet for the liquid expressed from the substance in the basket and collecting in the curb A. From the standard B the liquid is led away by a suitable pipe, as K. Several oscillating standards, L, are attached to the plate C, and support the plate M. By reference to Fig. 3 the construction of these standards is readily understood. A hollow stand or base, C', open at least on one side, and consisting of sides C² and top C³, is securely attached to a suitable base, as plate C. Through an opening in the top C³ a long bolt, l, passes, and upon the stand C are arranged the following parts, in this wise: Immediately above and below the top C³ are two elastic washers or spring-pieces, l' and l². Resting on the washer l' is a hollow standard-piece, L', on the top of which are two elastic washers or spring-pieces, l⁴ and l⁵, and between them the arms or plate M. Ordinary metallic washers, l⁶, are placed at each end of the bolt l, and the nut l' is then screwed onto the bolt l, and the various parts connected to the bolt are thus held firmly together. On the bearing-face of standard-piece L', where it comes in contact with the rubber, are preferably small points or spurs, which press into the rubber and hold it from working around out of place, as it is liable to do in oscillating. The plate M is provided with a sleeve, m, forming a ball-and-socket joint with the globular sleeve I on the shaft E, previously described, and shown in Fig. 2.

In connection with the machine, a suitable brake may be employed to control or stop the rotation of the shaft E. A preferable form of this brake, arranged to bear against the face of the pulley H, will now be described. This brake is a compound lever, and, as shown in Figs. 1, 5, 6, and 11, consists of preferably two arms, n, pivoted at n² into the plate C, and connected by a cross-piece, n'.

Projecting at right angles from the arms n are two arms, N, which unite in front of the shaft E, forming the treadle for operating the brake.

The brake proper consists of a metallic shoe, O, bolted to the cross-piece n'. Between this cross-piece n' and the shoe O is placed an elastic washer or spring-piece, o'. The front of the shoe O is faced with a suitable facing, o²—such as leather, &c.—to make a good bearing. Springs P reach from the bottom of the curb A to the treadle N, and serve to elevate it after its depression by the foot of the operator.

The method of operation is as follows: When the extractor is used as a wringer, the wet clothes are placed in the basket D, and preferably some care is taken to dispose them somewhat evenly about in it. The shaft E is now set in rapid motion by means of a belt engaging the pulley H. Under the rapidity of motion imparted to it, the rotating shaft E, with basket, will, if not perfectly bal-

anced, not only rapidly rotate, but assume a circular oscillatory path around a vertical line extended through the center of journal box or ball F, and will also frequently describe small circles while it moves in said main oscillatory path. Were the shaft and basket to be restrained from assuming these movements, the machine would be subject to a series of violent jars, which would soon wear out the machine, and which would at all times render its use dangerous. The whole machine is so constructed as to permit this circular oscillatory and other aforesaid movements. The arrangement of the plate M and the standards L, with their elastic connections, allows a suitable amount of these movements, at the same time gently limits them, and the standards and plate continuously act to bring the shaft E back into a true vertical position.

In Fig. 4 is shown the position of the parts in extreme oscillation. The rapid motion of the basket D forces the water to fly off from the clothes against the sides of the basket D, where it collects and runs down the sides until it meets with the openings d, through which it passes in consequence of the same centrifugal force, and is finally collected in the curb A, from which it is led off in the manner already described.

When the extractor is employed for purposes other than wringing clothes, the article from which the liquid is to be extracted is placed in the basket or equivalent receptacle affixed to shaft E, and the operation of extracting the liquid will be substantially the same as hereinbefore described in connection with the wringing of clothes.

It will be observed that the horizontal axial center of the globular pivotal portion F of the shaft E is always in the same horizontal plane with the center of the pulley and of the belt operating said pulley. The pull of the belt will therefore not so bear upon shaft E as to impart to the latter a tendency to leave a vertical position. The shaft E will therefore, so far as the pulley H is concerned, be entirely free to assume and maintain a perfectly vertical position.

It will be observed that while the standard L may lean in any direction from the vertical, the arms or plate M always remain horizontal, thereby assuring a more regular and even oscillation of the shaft E.

In the modification illustrated in Fig. 8 the standard L consists of a rubber or elastic-spring cylinder, S, through whose center passes a bolt, l, bolted to the hollow standard C or other suitable base. A sleeve or equivalent frame-work, T, embracing this rubber cylinder, is rigidly connected to one of the arms M. As the shaft E oscillates, the cylinder with the bolt also sways from the vertical, at the same time always exerting a pressure to return the standard, of which it forms a part, and the cylinder to a vertical position.

The shaft E and the upper ball-socket are

shown as used in connection with certain spring mechanism for upholding the shaft E and allowing it to oscillate within certain limits; but the shaft and upper ball-socket may be used in connection with other descriptions of spring mechanism.

A form of joint which can be substituted for the sleeve-joint is shown in Fig. 9, and consists in rounding vertically the edge R of the opening in plate or the joining-point of the arms M for the reception of the shaft. The shaft E, as it inclines, will then roll upon the said rounded edge, and the sleeve is then to be omitted.

While the various features of our invention are preferably employed together, nevertheless one or more of such features may be employed without the remainder, and one or more of such features may be employed in connection with extractors of descriptions other than that herein particularly specified.

What we claim as new and of our invention, and desire to secure by Letters Patent, is—

1. In a centrifugal extractor, the rotary shaft E, stepped and rotatable in globular oscillatory journal-box F, and pulley H, connected to shaft E and laterally inclosing said journal-box and its bearing, and extending down below the foot of said shaft, substantially as and for the purposes specified.

2. The combination of the curb A and basket D, laterally-oscillatory shaft E, plate M, and elastic standards L, for yielding laterally to accommodate the oscillatory movement of shaft E, substantially as and for the purposes specified.

3. The combination of shaft E, bearing G, and arms M, sliding upon shaft E, the extremities of the arms being supported upon vertical elastic supports elastically yielding in a direction lateral to the shaft, the plane of the arms being connected to the free end of the elastic support, and the fixed end of the elastic support being in a plane other than that of the arms, substantially as and for the purposes specified.

4. The combination of shaft E, stepped and rotatable in globular bearing G, arms M, located above said bearing and sliding on shaft E, and upright elastic supports having upper ends free to yield and move in the arc of a circle, and connected at said upper ends to the arms and at their lower ends to the frame, substantially as and for the purposes specified.

5. The combination of shaft E, stepped and rotatable in globular bearing G, arms M, located above said bearing, globular sleeve I, joint W, and upright elastic supports having upper ends free to yield and move in the arc of a circle, and connected at said upper ends to the arms and at their lower ends to the frame, substantially as and for the purposes specified.

6. The combination of globular bearing G, shaft E, terminating therewith, the shaft being stepped in said bearing, and arms M, located above said globular bearing G and sliding

upon shaft E, the extremities of the arms being supported upon elastic supports elastically yielding in a direction lateral to the shaft, substantially as and for the purposes specified.

7. The combination of globular bearing G, shaft E, terminating therewith, the shaft being stepped in said bearing, and arms M, located above said globular bearing G and sliding upon shaft E, the extremities of the arms being supported upon vertical elastic supports, elastically yielding in a direction lateral to the shaft, substantially as and for the purposes specified.

8. The combination of shaft E, carrying the basket D, and its bearing G, in which the shaft is seated, globular sleeve I, and elastic supports for laterally upholding the shaft E through the medium of the arms M, substantially as and for the purposes specified.

9. The combination of shaft E, bearing G, globular sleeve I, joint W, arms M, and standards L, each elastically connected to its arm M and to its base support or stand, substantially as and for the purposes specified.

10. The combination of the shaft E, sleeve I, joint W, arms M, standard-piece L', and base-supports C', and elastic pieces interposed between the standard and its base-support, substantially as and for the purposes specified.

11. The combination of the shaft E, arms M, standard-pieces L', and elastic pieces l', l'', l''', and l'', connected together, substantially as and for the purposes specified.

12. The combination of the shaft E, sleeve I, ball-and-socket joint W, arms M, standard-pieces L', and elastic pieces l', l'', l''', and l'', substantially as and for the purposes specified.

13. The combination of the shaft E, sleeve I, plate M, standard-pieces L', washers l'', elastic pieces l', l'', l''', and l'', and bolt l, the elastic piece l'' being between the upper side of the arm and washer l'', and the elastic piece l'' being between the lower side of the arm and the upper end of the standard-piece L', the elastic piece l' being between the lower end of the standard and the upper surface of the stand or base C', and the elastic piece l'' being between the under side of base C' and washer l'', substantially as and for the purposes specified.

14. The combination of shaft E, seated by journal-box F in bearing G, pulley H, connected to the shaft above bearing G and laterally surrounding the latter, sleeve I, joint W, arms M, and standards L, provided with elastic spring-pieces, substantially as and for the purposes specified.

15. The standards L, consisting of standard-pieces L', hollow base C', washers, bolt l, with nut, and elastic spring-pieces, substantially as and for the purposes specified.

16. The combination of the curb, standards B, base-plate C, hollow bases C', integral with said plate C, and standard-pieces L', elastic springs, arms M, and shaft E, substantially as and for the purposes specified.

17. The combination of the shaft E, journal-box F in bearing G, pulley H, surrounding said bearing, and brake consisting, essentially, of the lever N N, between which is the pulley
5 H, pivoted uprights n , connecting-plate n' , shoe O, faced as described, and an elastic piece, o' , between the shoe and plate n' , substantially as and for the purposes specified.

18. The compound lever-brake, pivoted at
10 n^2 and provided with elastically-backed shoe,

and the hair-pin lever N N, connected in front of the pulley H to form a treadle, the pulley H lying between the sides of the hair-pin lever and in front of the brake, substantially as and for the purposes specified.

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Witnesses:

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JNO. W. STREHLI.