

(No Model.)

A. A. DURAND.

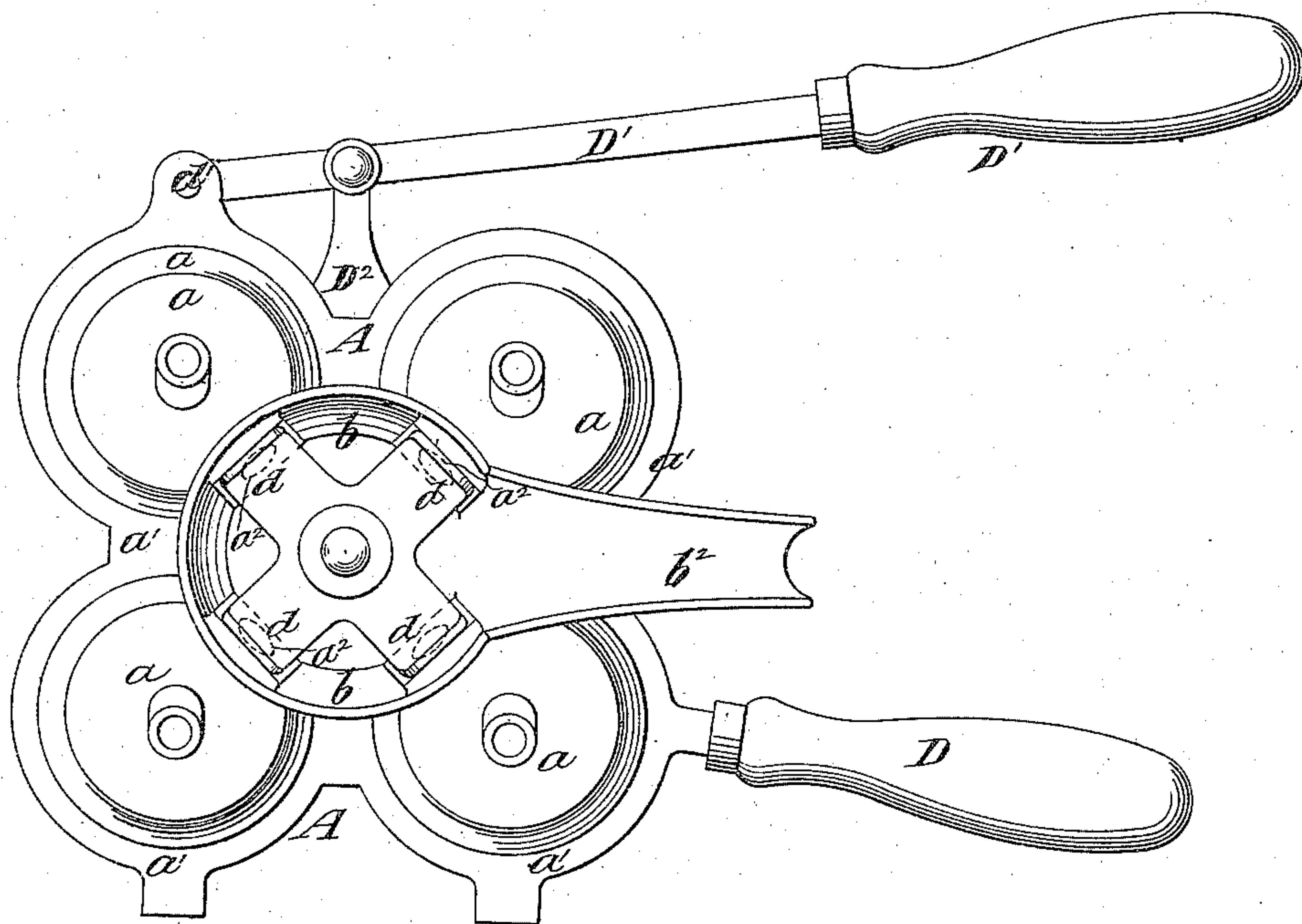
3 Sheets—Sheet 1.

COW MILKER.

No. 335,182.

Patented Feb. 2, 1886.

Fig. 1.



Witnesses:

Matthew Pollock

Jos. Haynes

Inventor:

Albert A. Durand

by his Atty.

Brown & Hall

(No Model.)

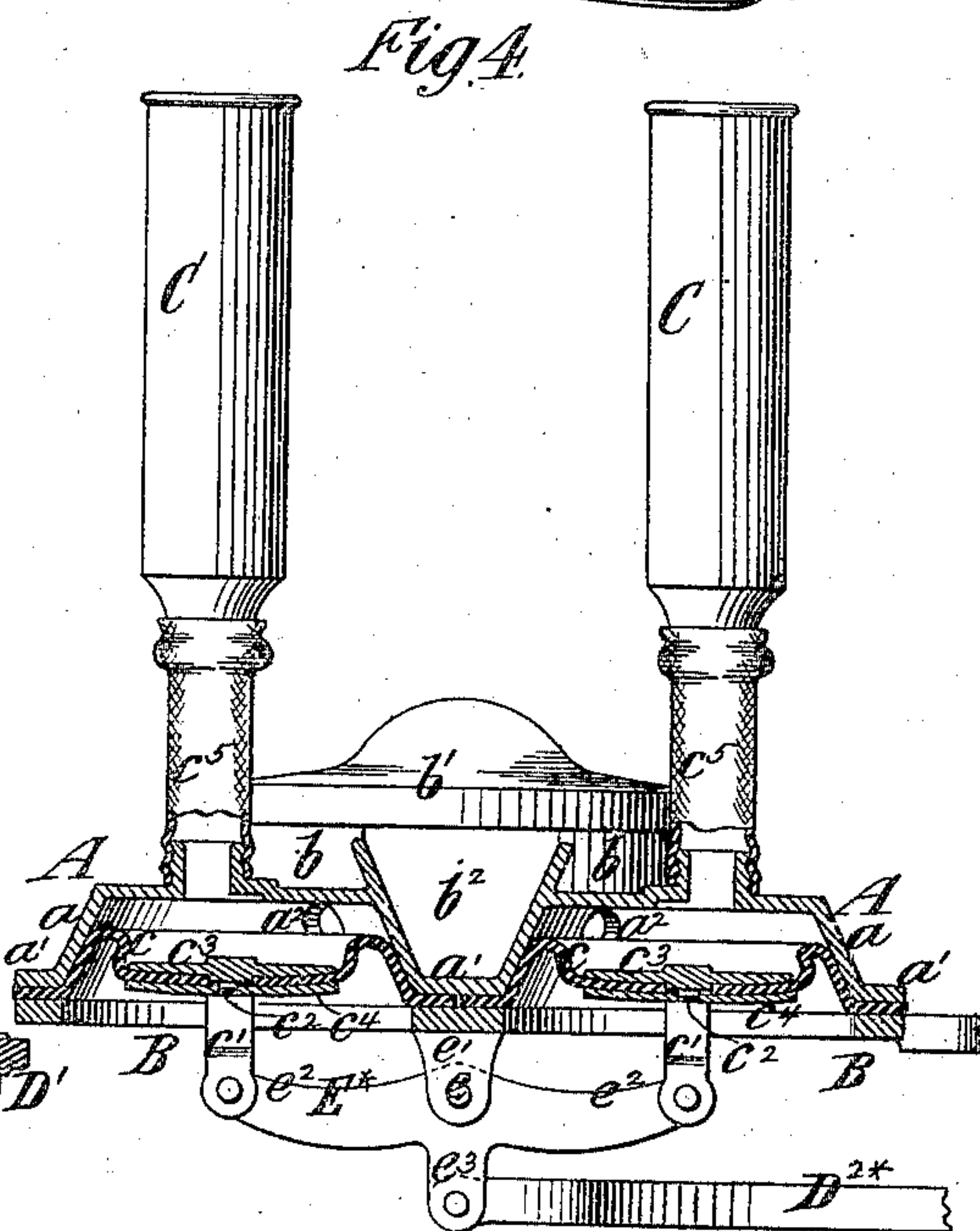
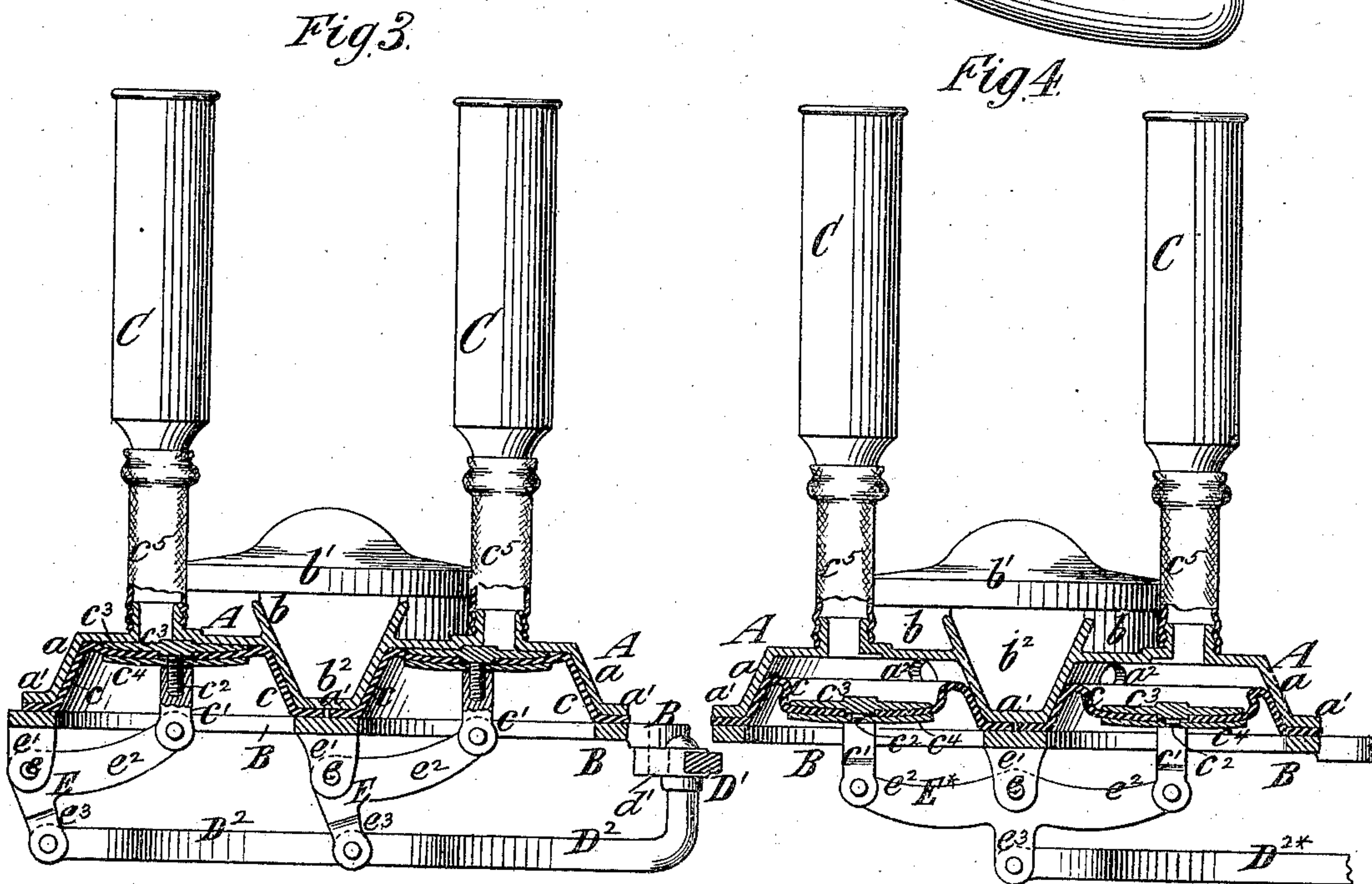
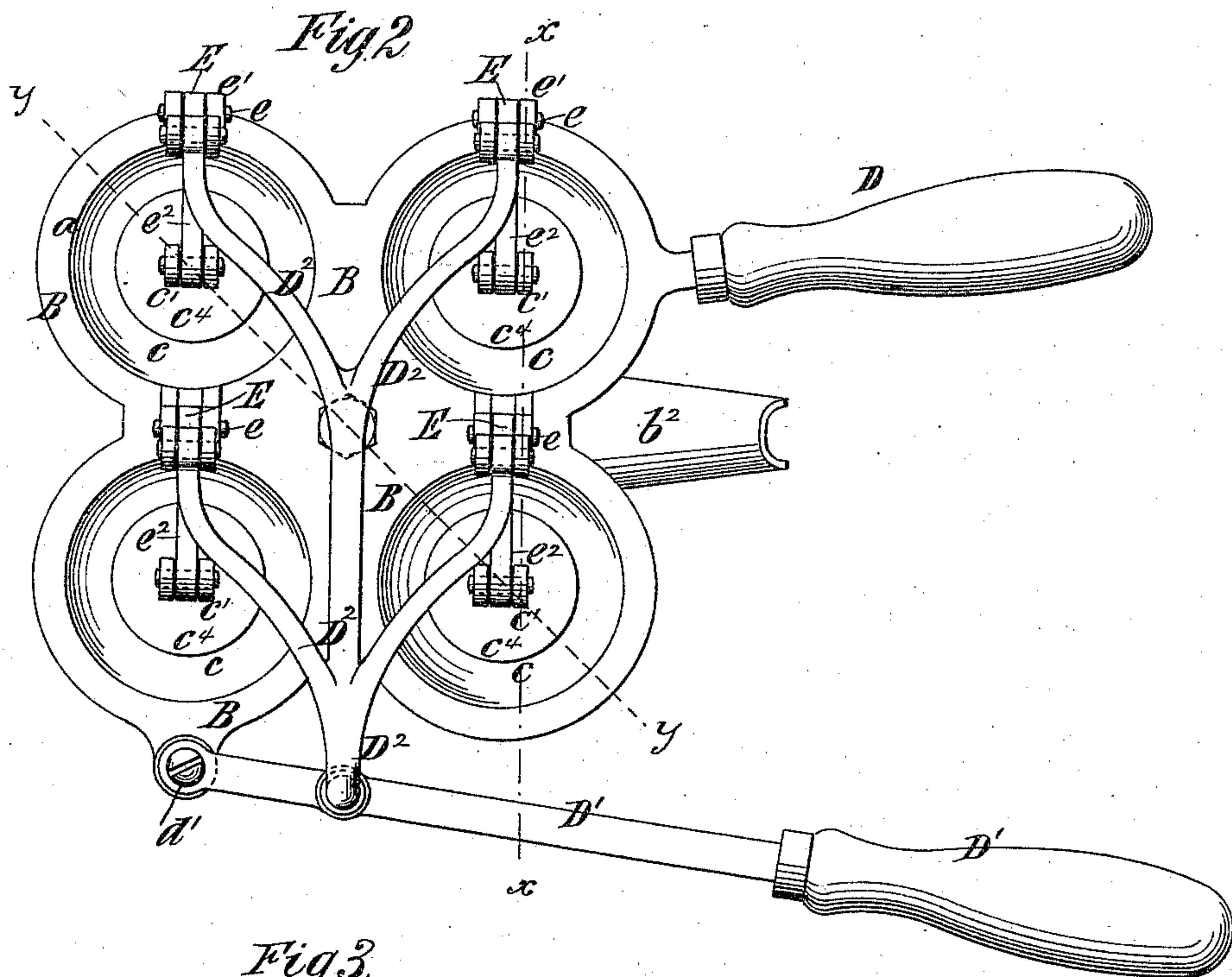
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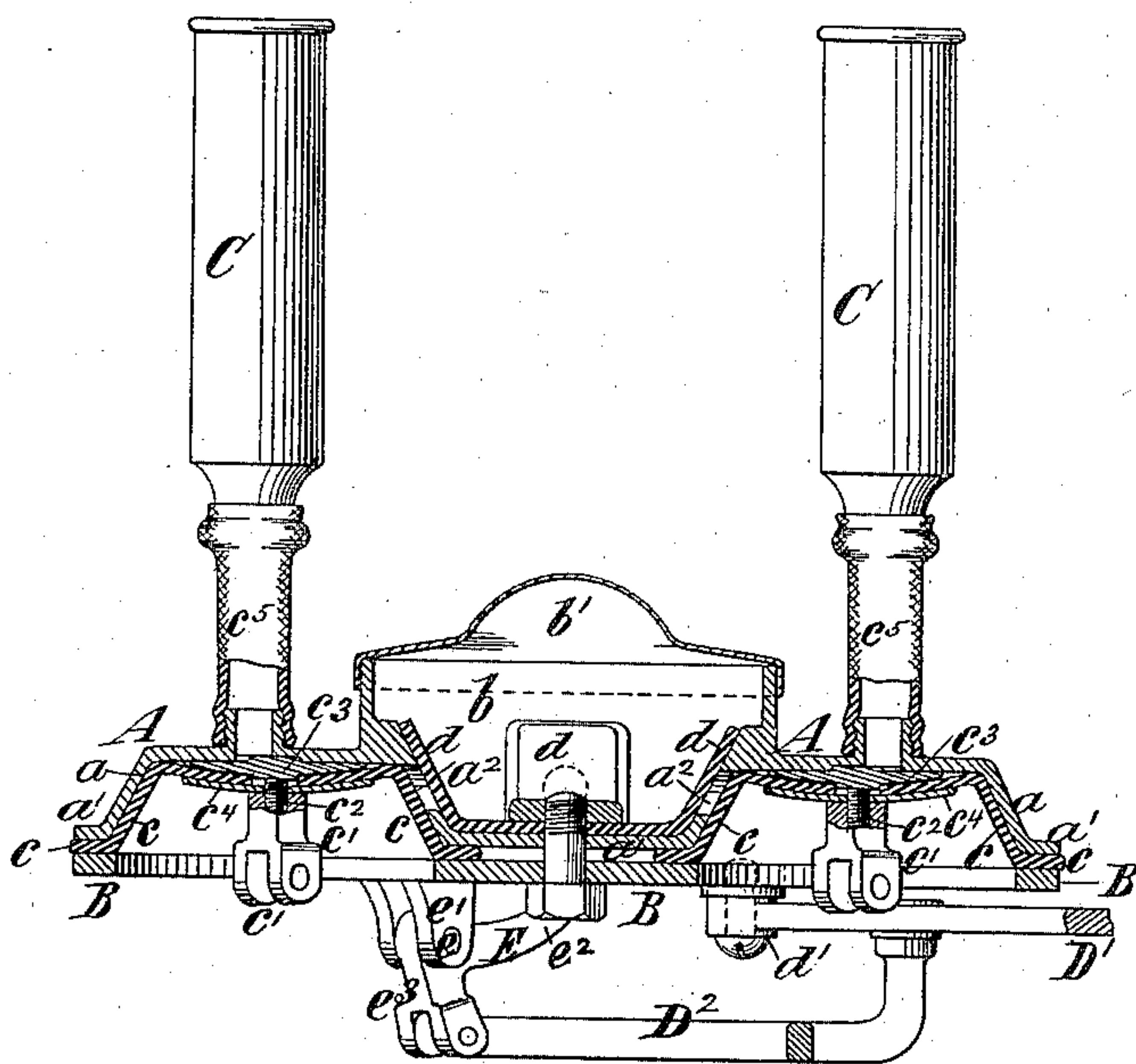
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Patented Feb. 2, 1886.

Fig 5.



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Witnesses:

Matthew Pollock
Geo. Haynes

UNITED STATES PATENT OFFICE.

ALBERT A. DURAND, OF NEW YORK, N. Y.

COW-MILKER.

SPECIFICATION forming part of Letters Patent No. 335,182, dated February 2, 1886.

Application filed April 27, 1885. Serial No. 163,496. (No model.)

To all whom it may concern:

Be it known that I, ALBERT A. DURAND, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Cow-Milkers, of which the following is a specification.

My invention relates to hand apparatus or machines for milking cows, designed to be separately applied to each animal, and in which are supported a series of pumps, one for each teat of the cow, and teat-sockets connected with the pump-chambers and adapted to receive the teats.

The pumps commonly employed in apparatus of this kind consist of a chamber or receiver and a flexible diaphragm secured thereto, and adapted, when not in operation, to conform substantially to the interior of the chamber or receiver.

In apparatus of this class the several pumps are operated by a lever or handle fitted to the body or frame of the apparatus, and having a shear-like action relatively to a handle fixed upon the body or frame; and my invention consists in a novel combination of lever mechanism with a handle-lever and the several pumps, whereby the diaphragms of the pumps will be operated with an easy straight pull or thrust, and not by canting action.

In the accompanying drawings, Figure 1 designates a plan of a milker embodying my invention, the teat-socket and the cover for the milk-receiver being removed in order to illustrate more clearly the construction of the remaining parts. Fig. 2 is an inverted plan of the apparatus. Fig. 3 is a sectional view upon the lines $x x$, Fig. 2. Fig. 4 is a sectional view similar to Fig. 3, but illustrating a modification of my invention; and Fig. 5 represents a sectional view upon the plane of the dotted line $y y$, Fig. 2.

Similar letters of reference designate corresponding parts in all the figures.

The apparatus consists, essentially, of a body portion, A, and a skeleton frame, B, secured to the under side of such portion, as best shown in Figs. 3 and 4.

In the body portion A are formed a series of chambers or pump-cups, a , which are or may be of taper form, and a central receiver or vessel, b , which may be closed by a cover, b' , as shown in Figs. 3 and 4. The several

pumps (here shown as four in number) deliver into the receiver or cup b , and from thence the milk is delivered by a spout, b^2 , as best shown in Fig. 1. Each pump consists of a chamber or cup, a , and a diaphragm, c , which conforms approximately in shape to the interior of the chamber or cup, and the several diaphragms are secured in place by being clamped between the flange a' and the frame B, as shown in Figs. 3 and 4. The diaphragms c are usually of india-rubber, and the central portion of each is connected to a post or stem, c' . Said post or stem may be connected in any suitable manner to the diaphragm. I have here shown a screw-threaded stud, c^2 , having a large head, c^3 , which is placed at the back of the diaphragm c , and a washer, c^4 , applied to the front of the diaphragm, and by screwing the post c' upon the stud c^2 a firm connection with the diaphragm is obtained.

With each of the pump chambers or cups a is connected a teat-socket, C, which may be attached by means of a flexible tube, c^5 , as clearly shown, and when these teat-sockets are applied to a cow's teats the outward movement of the diaphragms c will cause an exhausting action upon the teats. The return movement of the diaphragms will discharge the milk through holes a^2 into the central receiver, b , from whence it will flow by the spout b^2 .

The holes a^2 are provided with valves d , arranged within the receiver b , and opening inward relatively thereto. These valves d constitute the discharge-valves of the pumps, and are best represented in Fig. 5.

The frame B is provided with a fixed handle, D; and D' designates a movable lever and handle, pivoted to the frame at d' , and capable of operation with a shear-like action relatively to the fixed handle D.

Referring now particularly to Figs. 2 and 3, it will be observed that each pump is operated through a bell-crank lever, E, fulcrumed at e to a lug, e' , cast upon the frame B, and each having one arm, e^2 , pivotally connected with the stem c' of the pump.

With the arms e^3 of the several levers is pivotally connected a bifurcated rod, D², which is attached to the movable lever D', and is branched so as to connect the arms e^3 of the several levers E.

From the above description it will be understood that when the lever-handle D' is moved toward the handle D the levers E will move the diaphragms c of the several pumps straight away from their chambers or cups a 5 simultaneously, and will thereby produce an exhausting action upon the cow-teats. When the lever-handle D' is moved in a reverse direction, or away from the fixed handle D , the 10 diaphragms will all be moved inward or collapsed relatively to their chambers or cups a , and the milk from the pumps will be discharged through the openings a^2 , controlled by the valves d , and into the chamber or receiver b .

15 It will be seen that the bifurcated connection D^2 and the bell-crank levers E , with which it is connected, form a very simple means for operating the diaphragms by a straight pull and simultaneously.

20 Referring now to Fig. 4, I would say that the pumps are there connected in pairs by two beams or double bell-crank levers, E^* , which are pivoted at e to lugs or ears e' , cast upon the frame B . The two pumps of a pair have 25 their diaphragm-stems c' pivotally connected with arms e^2 of the beam E^* , and with the arm e^3 of said beam is connected a rod, D^{2*} , which extends from the handle-lever D' . (Not shown in Fig. 4.) There being four pumps, 30 two beams E^* will be required according to the modification shown in Fig. 4, and the rod D^{2*} is bifurcated, or has two branches, which are connected with the arms e^3 of said two levers E^* .

35 According to this modification of my invention the two pumps of a pair will be operated simultaneously, the diaphragm of one pump being distended or moved outward while the diaphragm of the other pump is being col- 40 lapsed or being moved upward to discharge the pump.

I am aware that it is not new to operate a diaphragm-pump by means of a pump-lever pivoted to swing upward and downward at 45 right angles to the pump-chamber, and I am also aware that a single lever has been combined with the stems of several diaphragms, so as to give them all a tilting or canting action as the lever is swung in one direction or the 50 other.

In my Letters Patent No. 216,838, granted June 24, 1879, the body has combined with it

a large screw-thread, and the diaphragms are all connected with a nut having a projecting handle, and the diaphragms are operated with 55 a direct pull by turning the nut upon the screw.

The device shown in my said patent is preferable to those above referred to, in which the diaphragms have a canting action, because 60 the diaphragms are operated with a direct pull, or are moved axially; and the object of my present invention is to provide a simpler means than the large screw and nut by which the several diaphragms may be operated with 65 a direct pull. This result I accomplish by means of the levers E or E^* , which are pivoted to swing in a plane transverse to the plane in which the pumps are arranged, a pivoted lever-handle arranged to move in a plane par- 70 allel to the plane in which the pumps are arranged, and connections, such as the rod D^2 , whereby the swinging movement of the lever-handle D' transmits motion to the several levers E or E^* .

75 What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cow-milker, the combination, with a number of pump chambers or cups and diaphragms, of levers pivoted to swing in planes 80 transverse to the plane in which the pumps are arranged, a fixed handle attached to the apparatus, a pivoted lever-handle arranged to move in a plane parallel to the plane in which the pumps are arranged, and connections be- 85 tween the pivoted lever-handle and the said levers, by which the said levers will be caused to operate the diaphragms with a direct pull, substantially as herein described.

2. In a cow-milker, the combination, with a 90 number of pump chambers or cups provided with teat-sockets, and diaphragms fitting said chambers or cups, of bell-crank levers E , pivoted to swing in planes transverse to the plane in which the pumps are arranged, a fixed han- 95 dle, D , attached to the apparatus, and a movable handle, D' , and connection D^2 , whereby the several bell-crank levers will be operated to move the diaphragms with which they are connected, substantially as herein described. 100

ALBERT A. DURAND.

Witnesses:

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