

3 Sheets—Sheet 1.

No. 442,051.

Patented Dec. 2, 1890.

Fig. 1.

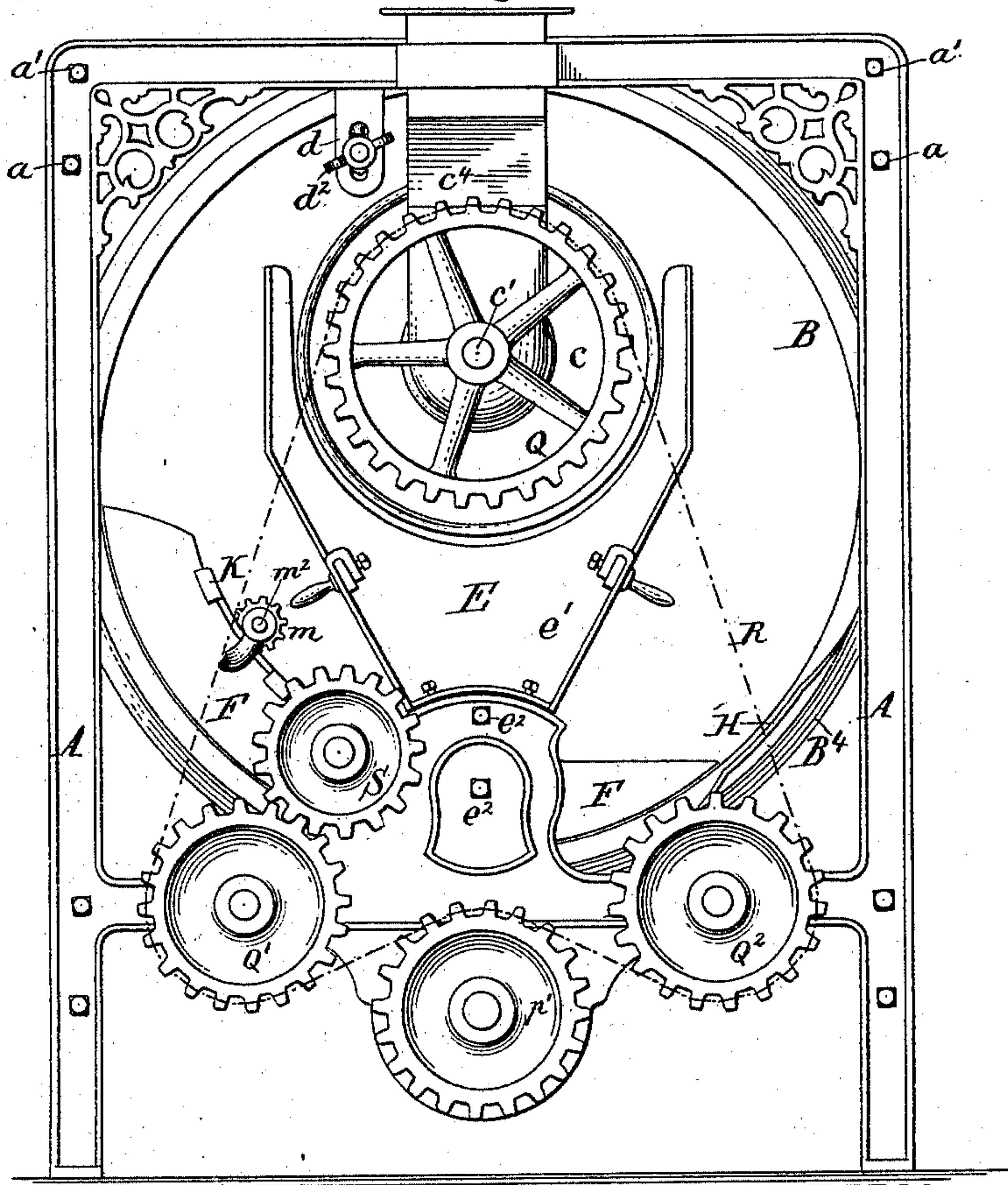


Fig. 2.

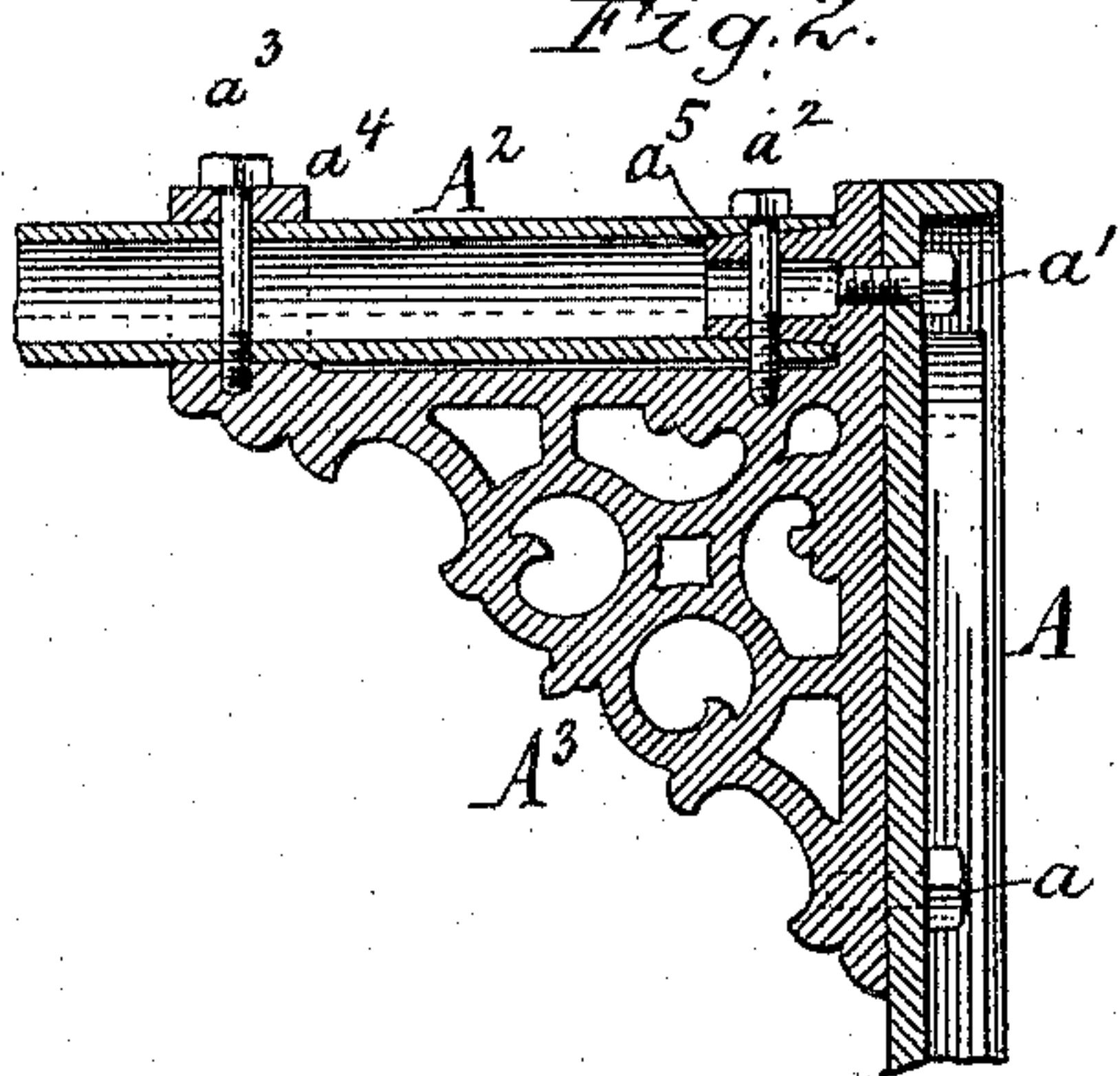


Fig. 3.

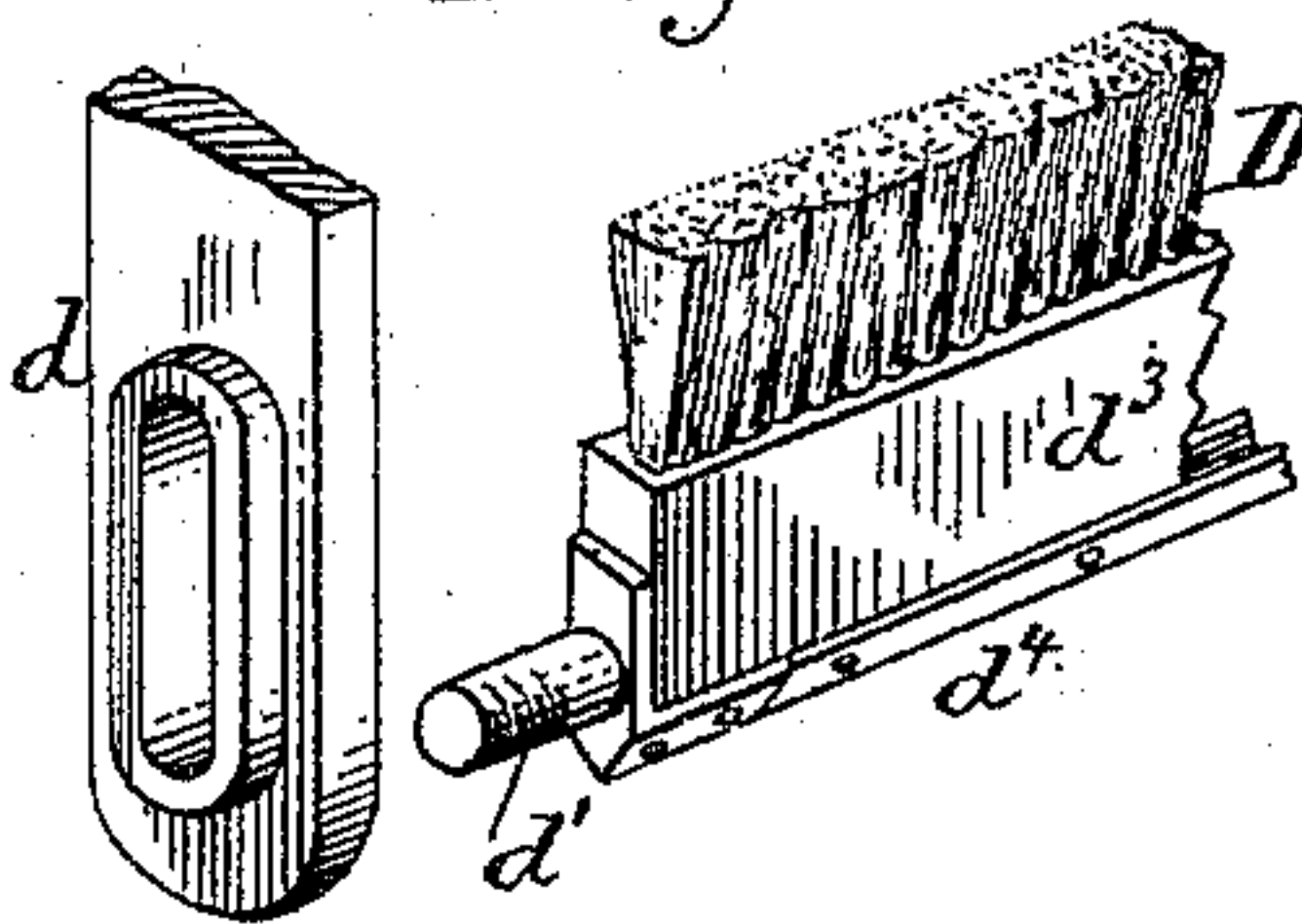
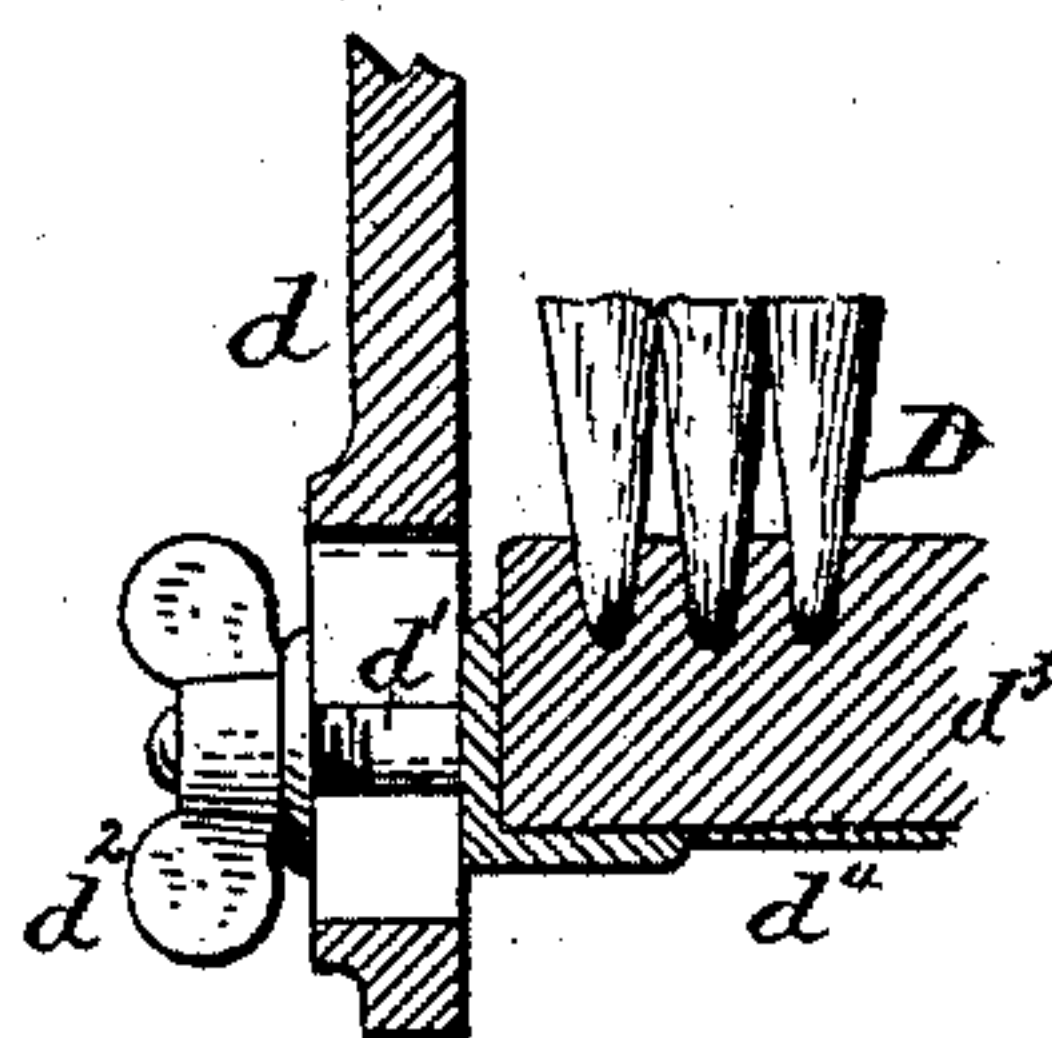


Fig. 4.



Chas. J. Buchheit.
Theo. L. Popp. } Witnesses.

H. W. Howell-Inventor.
By Wilhelm & Bonner
Attorneys.

(No Model.)

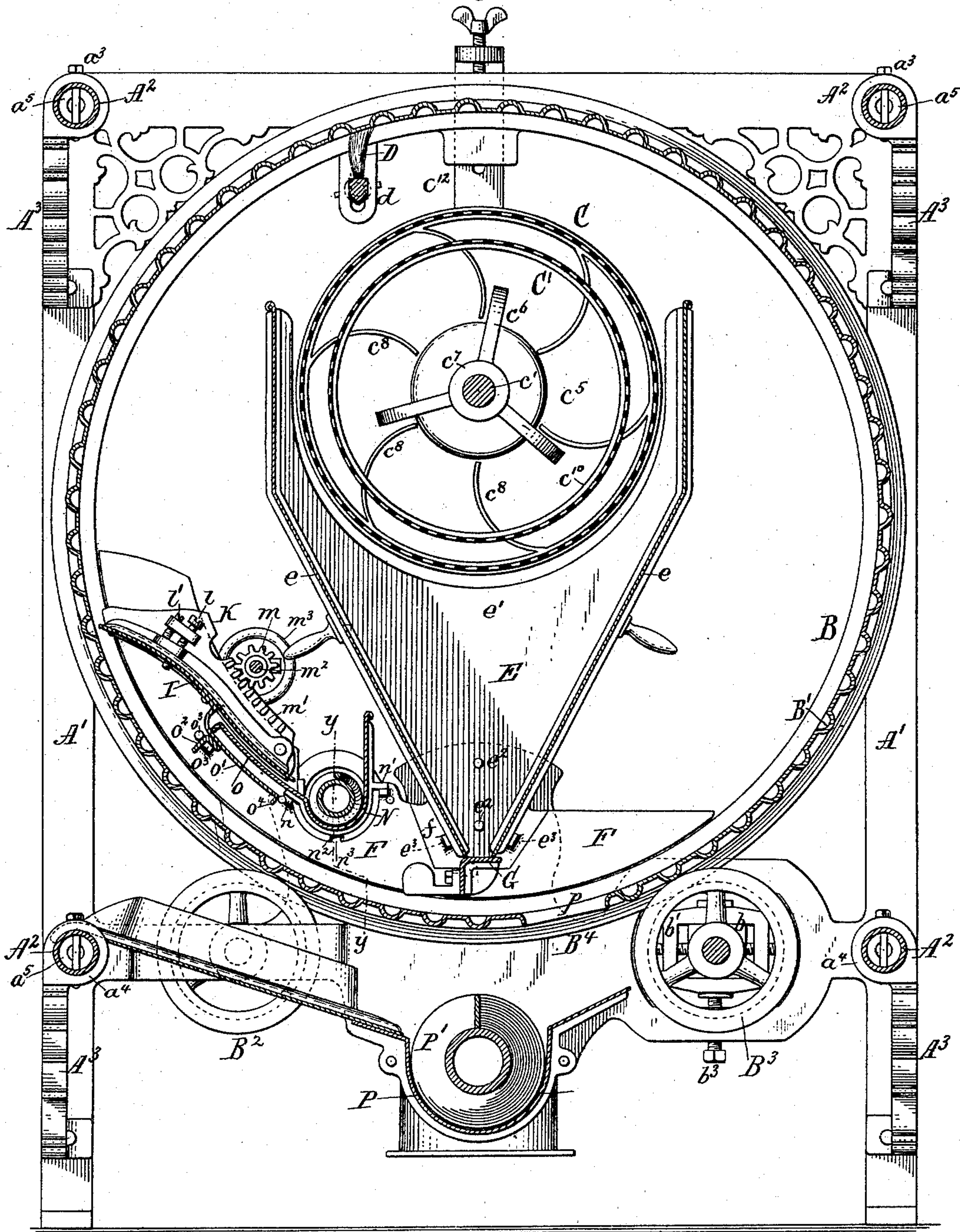
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F. W. HOWELL.
COCKLE SEPARATOR.

No. 442,051.

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Fig. 5.



Chas. J. Buckheit,
Theo. L. Popp. } Witnesses.

F. W. Howell—Inventor.
By Wilhelm Borner.
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 6.

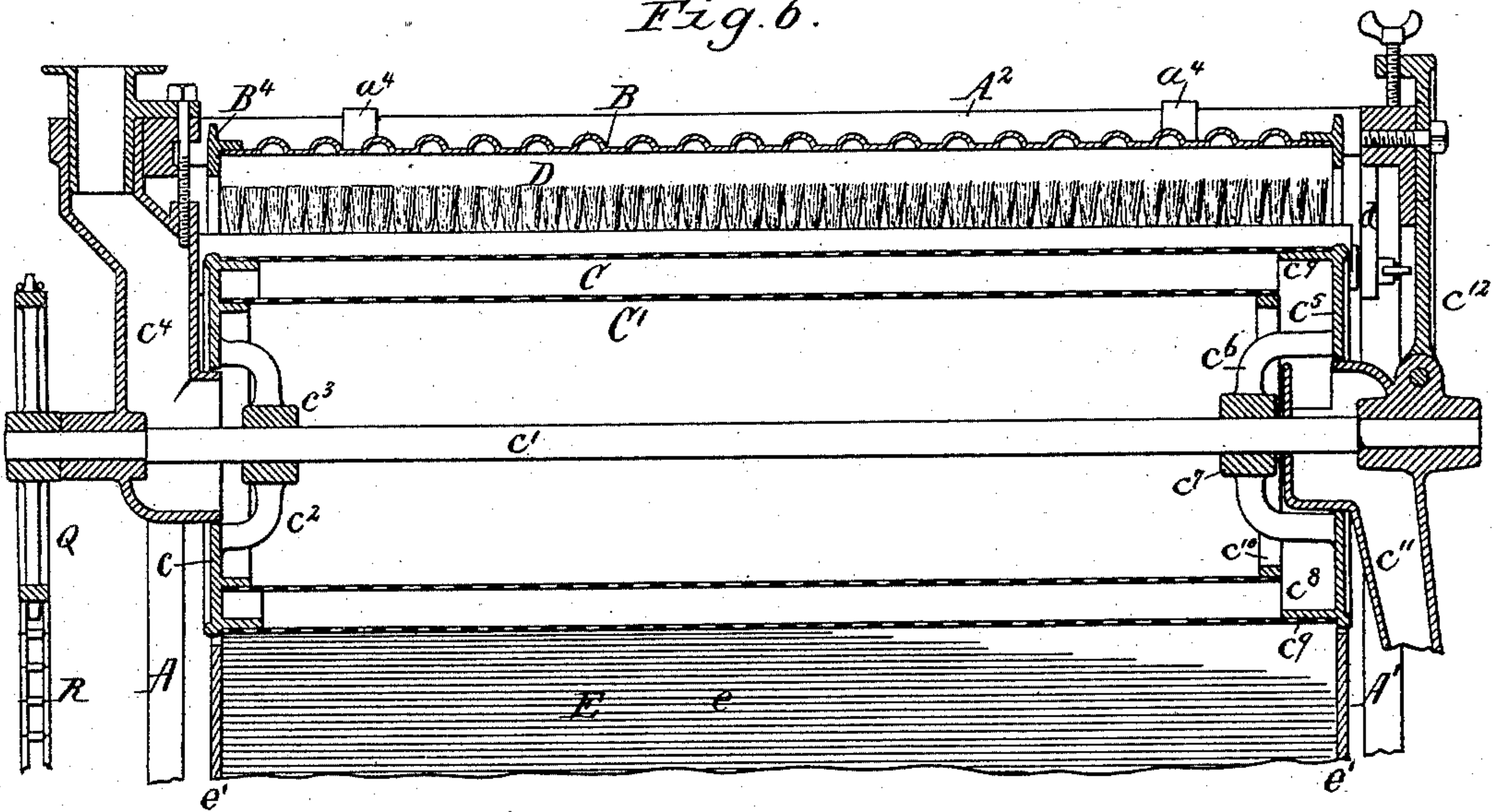


Fig. 7.

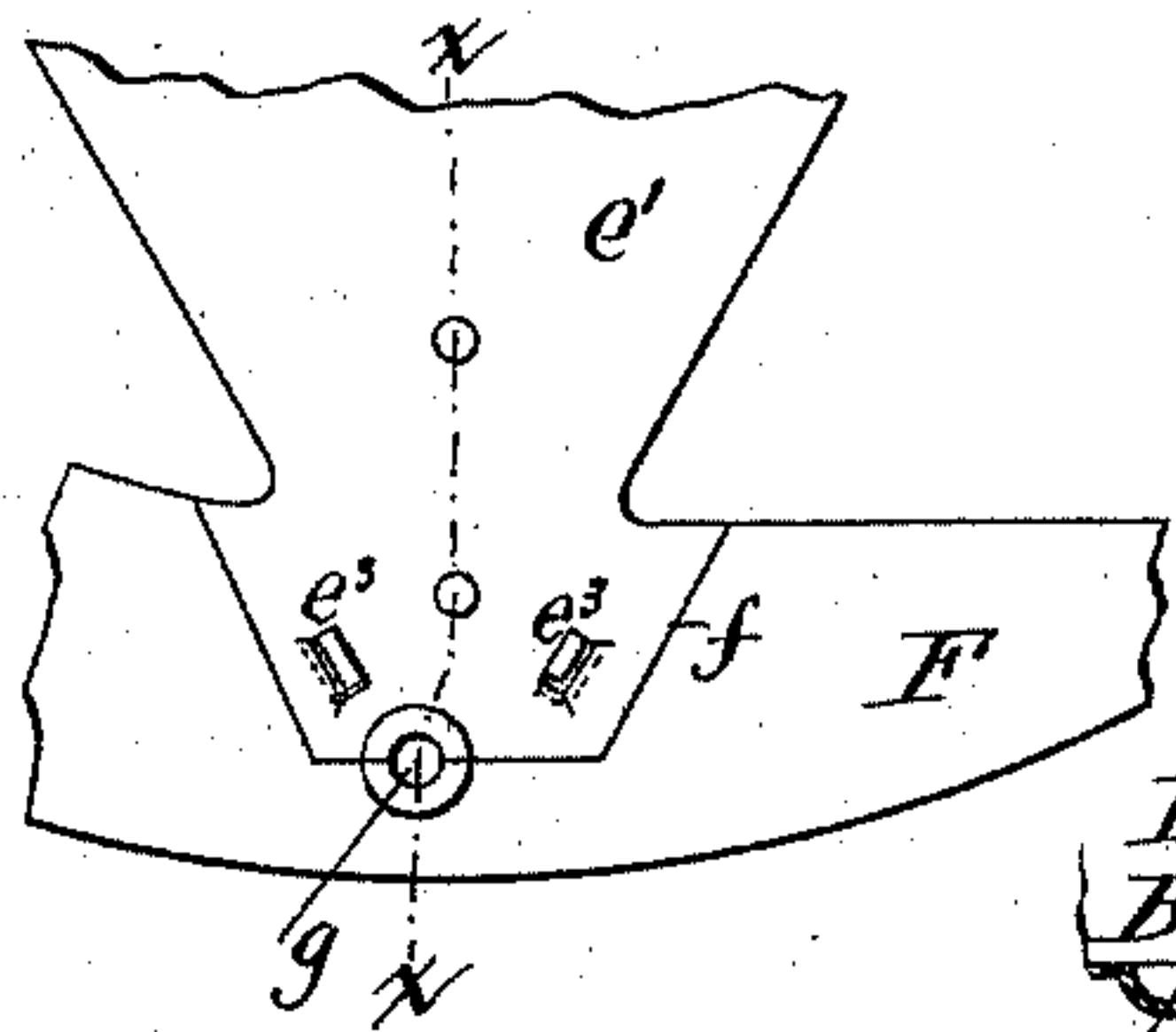


Fig. 8.

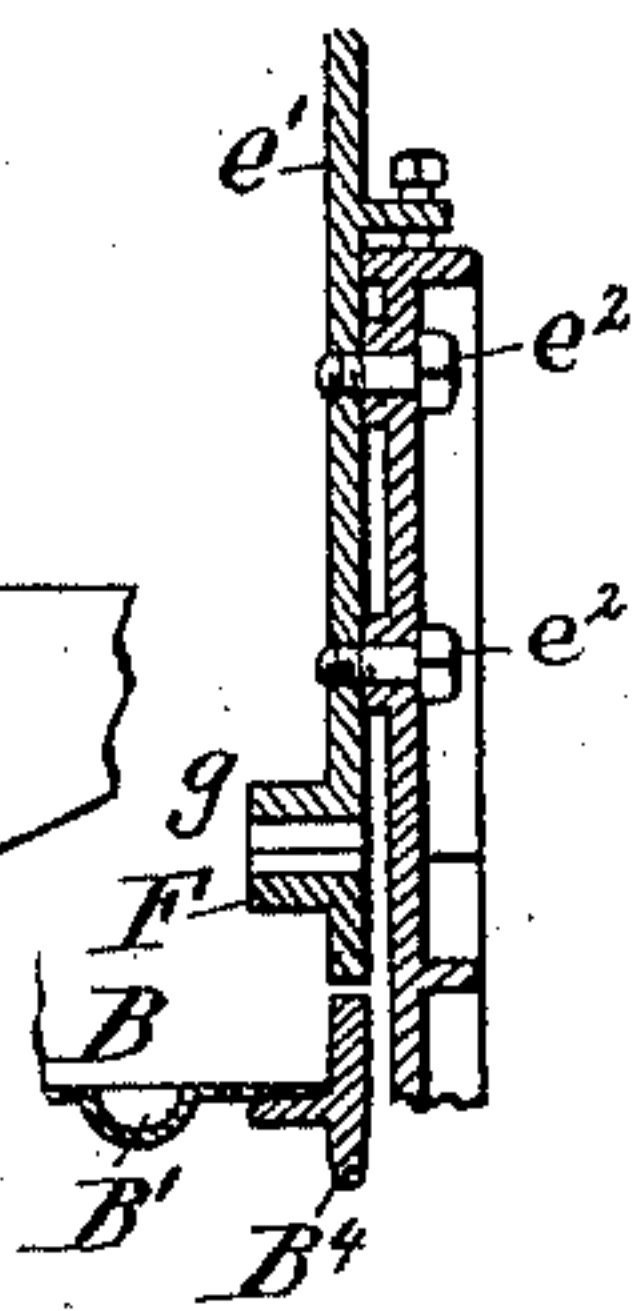


Fig. 9.

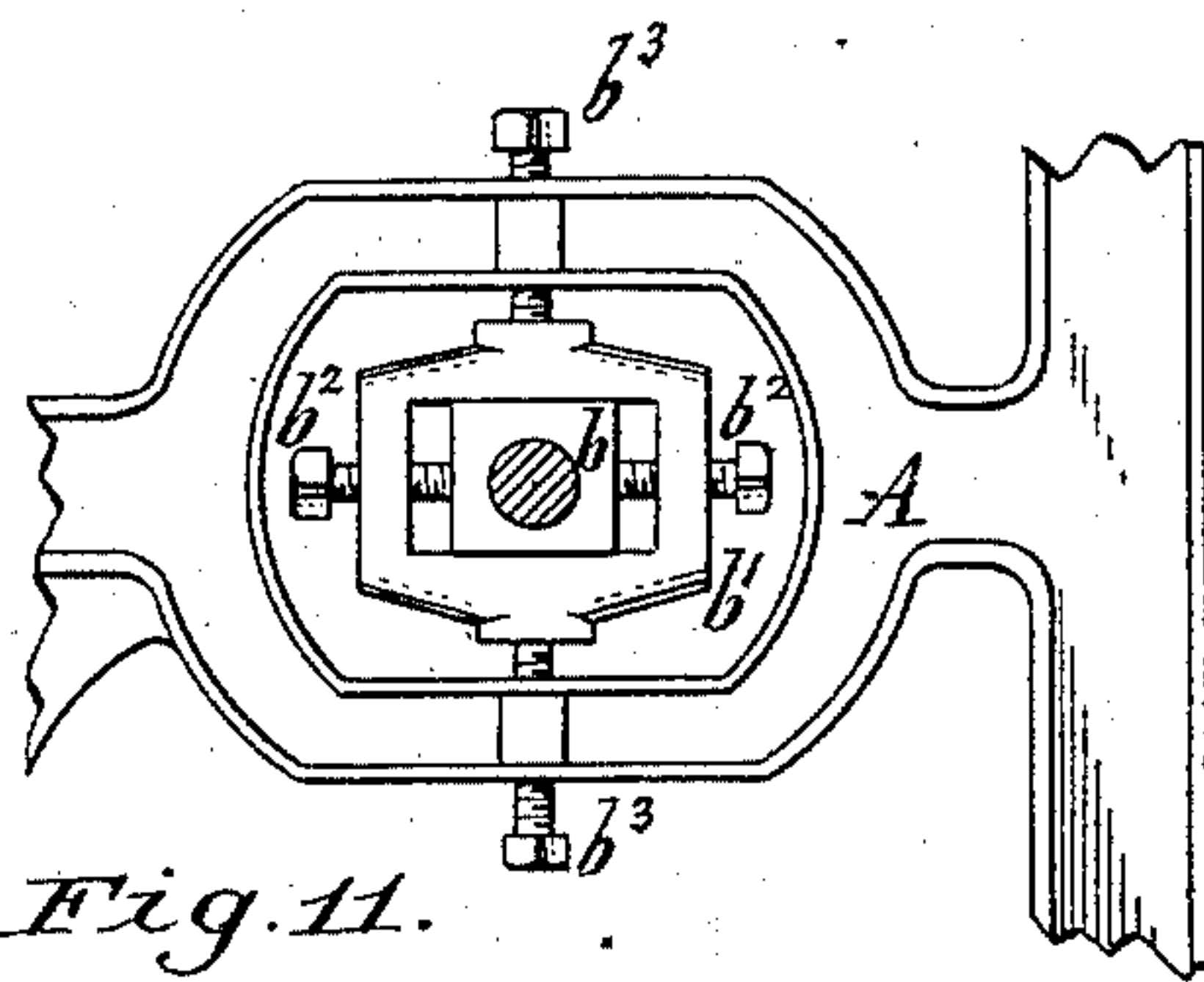


Fig. 11.

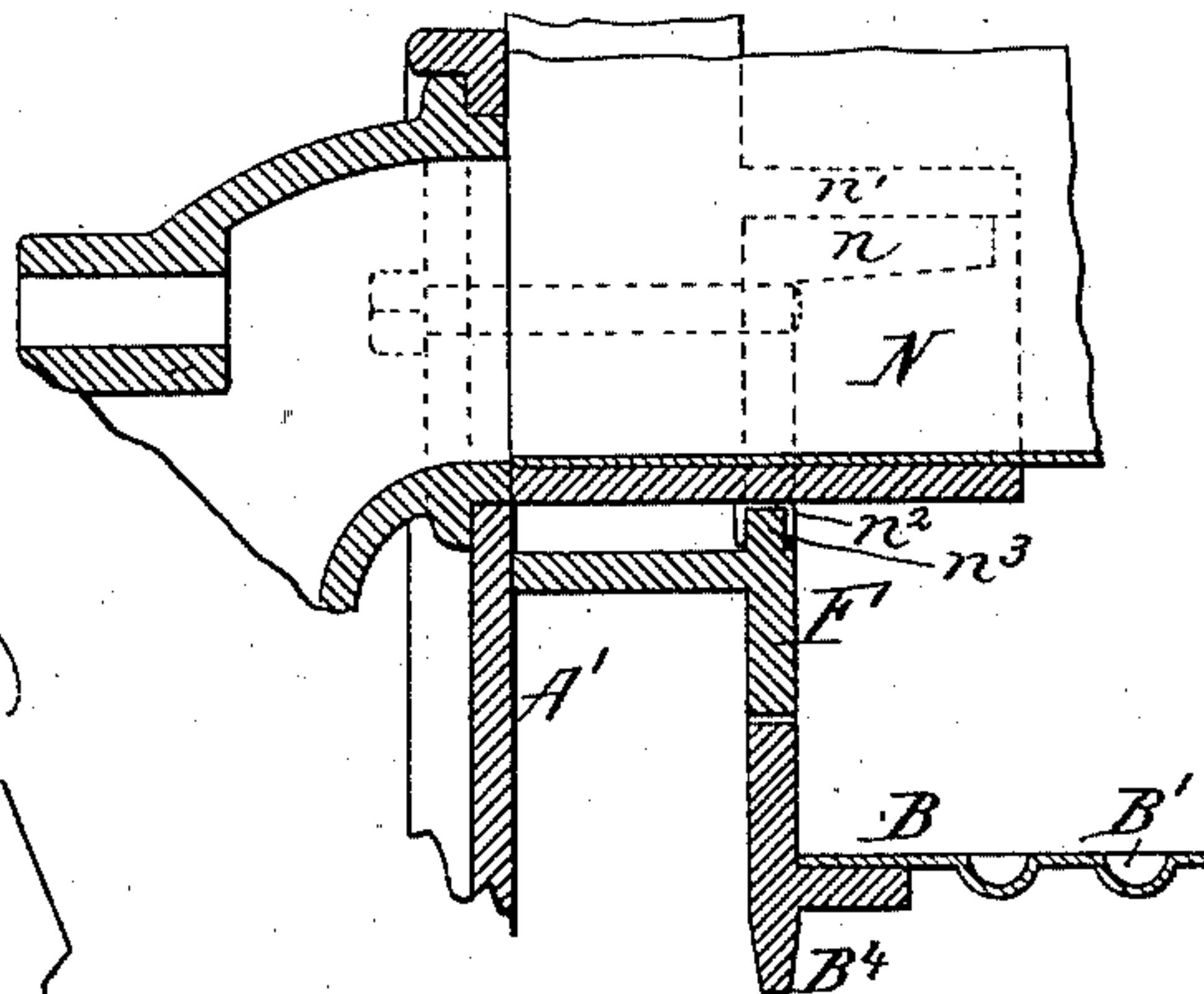
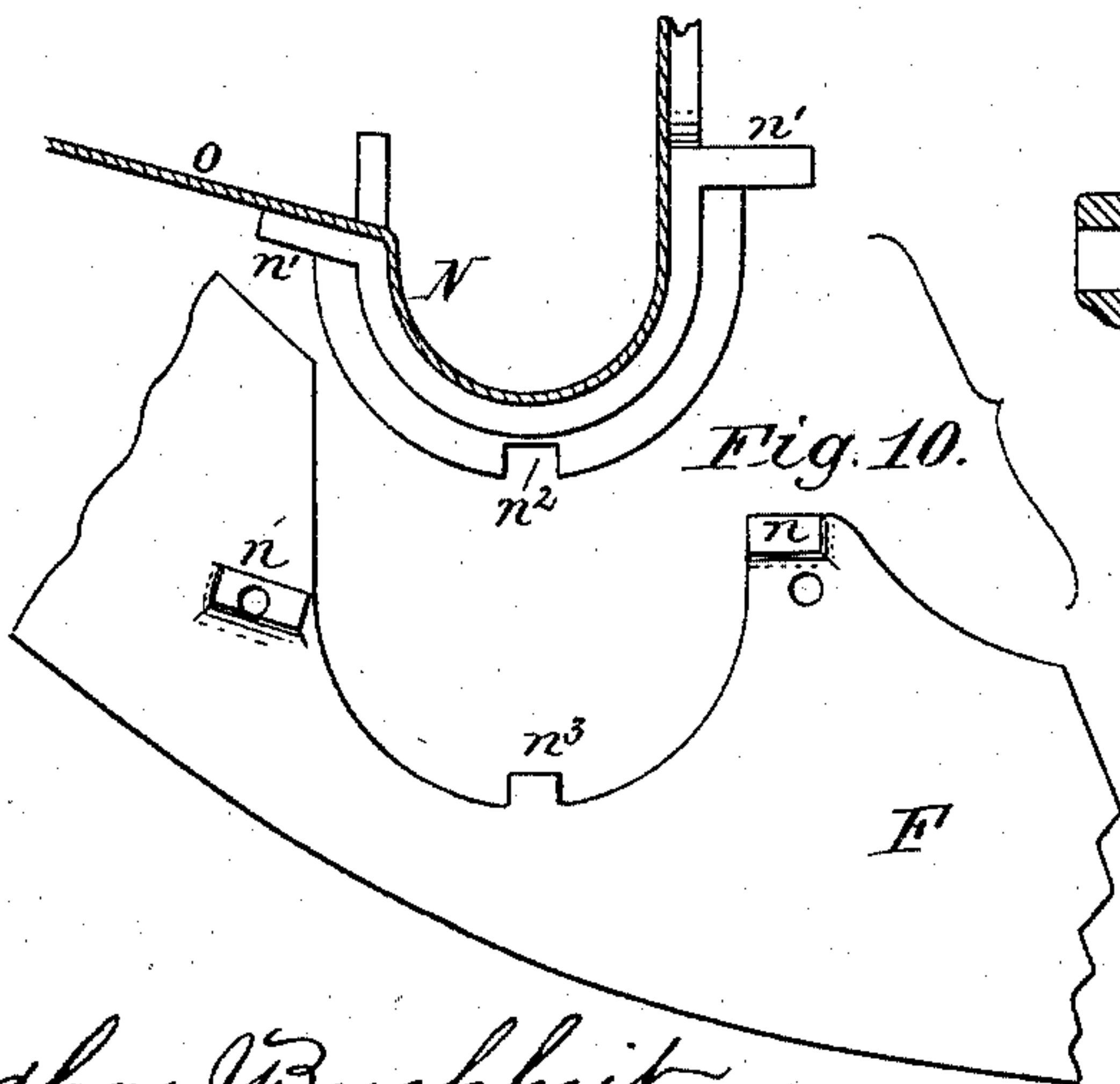


Fig. 10.



Chas. J. Buchheit.
Theo. L. Popp. } Witnesses.

H. W. Howell—Inventor.
By Wilhelm H. Popp
Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK W. HOWELL, OF BUFFALO, NEW YORK, ASSIGNOR TO
MARGARET T. HOWELL, OF SAME PLACE.

COCKLE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 442,051, dated December 2, 1890.

Application filed July 12, 1887. Serial No. 244,071. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. HOWELL, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Cockle-Separators, of which the following is a specification.

This invention relates to an improvement in that class of cockle-separators which consists of a revolving drum provided on its inner side with cells or indentations, in which the cockle and other small impurities embed themselves and by which the same are elevated and delivered to a catch-board, while the wheat and larger grains roll back and are separately discharged.

The present invention has reference more particularly to improvements upon the machine described and shown in Letters Patent No. 346,815, granted to me August 3, 1886, and has for its object to increase the separating capacity of the machine and to improve the construction of the same in various respects.

The invention consists of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 represents an elevation of the feed end of the machine. Fig. 2 is a vertical longitudinal section of one of the upper corners of the main supporting-frame on an enlarged scale. Fig. 3 represents a fragmentary perspective view of the brush and one of its supporting-hangers separated from each other. Fig. 4 is a longitudinal sectional elevation of one end of the reversible brush and its supporting parts. Fig. 5 is a cross-section of the machine on an enlarged scale. Fig. 6 is a longitudinal sectional elevation of the upper portion of the machine. Fig. 7 is a fragmentary internal elevation of the end plate of the hopper and the shield in which the hopper is supported. Fig. 8 is a vertical section in line *x x*, Fig. 7. Fig. 9 is a side elevation, on an enlarged scale, of the adjustable support in which the driving-rollers of the drum are journaled. Fig. 10 represents a sectional elevation of the cockle-trough and the plate or shield in which the cockle-trough is supported, the cockle-trough being raised from the shield. Fig. 11 repre-

sents a vertical section of the discharge end of the cockle-trough in line *y y*, Fig. 5, on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

The stationary supporting-frame of the machine is composed of end frames *A A'* and tubular longitudinal connecting bars or pieces *A²*, which are secured together by brackets or corner-pieces *A³*. The brackets *A³* are secured to the end frames *A A'* by horizontal bolts *a a'* and to the tubular connecting-pieces *A²* by vertical bolts *a² a³*. The brackets *A³* are each provided at their outer ends with a collar or ring *a⁴*, which embraces the tubular connecting-pieces and through which the bolt *a³* passes, and at their inner ends with a nipple *a⁵*, which fits into the end of the tubular connecting-bar and through which the fastening-bolt *a²* passes. This construction forms a simple and rigid connection between the end pieces and longitudinal pieces of the supporting-frame.

B represents the rotating separating-drum provided on its inner surface with cells or indentations *B'*, and *B² B³* represent the rollers supporting the drum, the drum being provided with end rings *B⁴*, which run in the grooves of the supporting-rollers. The rollers *B²* are arranged on one side of the drum and are journaled in fixed bearings formed in the end frames *A A'*, while the rollers *B³* are arranged on the opposite side of the drum and mounted in movable bearings *b*. Each bearing *b* is arranged in a rectangular frame *b'*, and is made horizontally adjustable therein by means of set-screws *b²* working in threaded openings formed in the sides of the frame *b'* and bearing against opposite sides of the bearings *b*, as represented in Fig. 9. The frames *b'* are each arranged in an opening or recess in the end frames *A A'* and are supported and made vertically adjustable by set-screws *b³* working in screw-threaded openings in the end frames and bearing against the upper and lower sides of the adjustable frame *b'*. By this means the rollers *B³* on one side of the drum can be adjusted vertically and horizontally, as may be necessary, in order to cause the rings *B⁴* of the drum to

bear uniformly upon the supporting and driving rollers.

C C' represent two separating-reels arranged lengthwise in the drum, one within the other, and whereby the larger grain which should not go to the separating-drum is separated from the small grain and seeds. The reels C C' are clothed with wire-cloth or perforated metal of the proper mesh to separate the large grain from the small and broken grain, cockle, &c. The inner reel C' is clothed with coarse wire-cloth or perforated metal, so that all the grain and seeds, excepting large wheat, pass through the inner reel and upon the outer reel C. The latter is provided with a finer clothing, which permits the cockle and small seeds only to pass through, while the medium-sized wheat is carried to the tail end of the outer reel, where it commingles with the large wheat which tails off from the rear end of the inner reel, the reels being slightly inclined in order to produce this movement of the grain. The reels C C' are provided at their front end with a head c , which is constructed with two concentric flanges to which the clothing of the reels is secured, and which is supported on the shaft c' by means of arms c^2 and a hub c^3 .

c^4 represents the feed-spout which enters a central opening in the head c .

c^5 represents the head arranged at the tail ends of the reels and secured to the shaft c' by arms c^6 and a hub c^7 . The head c^5 is provided with a central opening, and on its inner side with curved elevating ribs or buckets c^8 , extending from this opening to the outer peripheral flange c^9 of the head, to which flange the rear end of the outer reel-clothing is secured. The rear end of the inner reel is secured to a ring c^{10} , which is attached to the elevating-ribs c^8 .

c^{11} represents the discharge-spout, which projects into the central opening of the rear head c^5 of the reels, and which is supported by a vertically-adjustable bar c^{12} . The large wheat, which tails off from the inner reel C', and the medium-sized wheat, which does not pass through the meshes of the outer reel C, commingle at the rear end of the outer reel and are elevated by the buckets or ribs c^8 and delivered into the discharge-spout c^{11} , by which this kind of grain is removed without passing upon the indented drum. By constructing the machine with two reels in this manner the separating capacity of the machine and the efficiency of the indented separating-drum are greatly increased.

D represents a reversible brush, which is arranged lengthwise within the drum and adapted to bear against the inner surface of the separating-drum or the outer surface of the outer reel C, as may be desired. The brush D is supported in slotted hangers d , depending from the top portion of the end frames A A', and is provided at both ends with screw-threaded shanks d' , which project through the slots of the hangers d and are se-

cured therein by thumb-nuts d^2 applied to said shanks and bearing against the outer sides of the hangers d . Upon loosening the thumb-nuts d^2 the brush can be either reversed, so as to bear against the reel C or the drum B, as desired, or it can be adjusted in the slots of the hangers to take up the wear of the brush. The stock d^3 of the brush is provided on its outer edges with a longitudinal angle-iron or strip d^4 , which stiffens the brush and prevents the same from warping, sagging, or twisting.

E represents the feed-hopper arranged lengthwise in the drum B below the reels C C' and receiving the material passing through the meshes of the outer reel. The feed-hopper E is composed of side plates e and end plates e' . The end plates e' are secured to the end frames A A' by horizontal bolts e^2 , and their V-shaped lower ends rest in correspondingly-shaped recesses f , formed in plates or shields F. The latter are curved concentric with the drum B and secured to the end frames A A'.

G represents the valve which closes the discharge-opening of the hopper E, and which is opened intermittently by a cam H, formed on the drum B, the valve being weighted so as to remain in a closed position when released by the cam. The valve G is journaled in bearings g , formed partly in the shields F and partly in the end pieces e' of the hopper, as clearly represented in Figs. 7 and 8. This construction enables the valve to be easily applied and removed upon lifting the end plates of the hopper from the shields. The end plates of the hopper are provided near their lower ends with lugs or projections e^3 , upon which the lower ends of the side plates e are supported.

I represents the inclined catch-board arranged within the drum B on the ascending side thereof, and which is made in the form of a compound curve, whereby the board is stiffened and a close fit of the same with the drum B is obtained. The upper part of the catch-board is made convex on its upper side and the lower part of the catch-board is made concave on its upper side, as represented in Fig. 5. The catch-board is supported at both ends by carriers K, which slide upon the shields or plates F, so that the catch-board can be raised or lowered in the drum. The catch-board is pivoted near its lower edge to the carriers K, and is attached to said carriers near its upper edge by screws l , by which the upper edge of the catch-board can be adjusted toward and from the inner surface of the drum.

l' represents jam-screws, which bear against the upper side of the catch-board and stop the vibrations of the same, thereby preventing the adjusting-screws l from working loose. The carriers K of the catch-board are moved on the shields F by gear-wheels m , which engage with gear-teeth m' , formed on the inner sides of the carriers. By forming the teeth m' on the side of the carriers K the material

is allowed to fall through the spaces between the teeth, thereby preventing the latter from becoming clogged with grain, &c. The gear-wheels m are mounted on a horizontal shaft m^2 , which is journaled in bearings secured to the shields F , and the shaft is provided with a hand-wheel m^3 , whereby it is turned.

N represents the conveyer-trough, which receives the cockle and other small material from the catch-board I , and which is seated in the shields F . The latter are provided with lugs n , upon which the flanges n' of the conveyer-trough N rest. The trough N is provided in its under side with notches n^2 , which fit over projections n^3 formed on the shields F , and whereby the trough is centered in the recesses of the shields and prevented from turning therein.

o represents an extension or plate formed on the inner side of the cockle-trough and extending upwardly below the lower portion of the catch-board I .

o' represents a guard-plate which is secured with its upper end to the under side of the catch-board, and which extends downwardly below the extension o of the cockle-trough and conceals the same. This guard-plate prevents grain, dust, and other material from entering between the catch-board and the extension o . The guard-plate o' is supported by an angle-iron o^2 , which rests loosely between lugs o^3 , formed on the inner sides of the shields F .

o^4 represents stops formed at the lower end of the guard-plate o' , and which strike the angle-iron o^2 , so as to limit the upward movement of the catch-board and prevent the teeth m' from becoming disengaged from the gear-wheels m . The angle-iron o^2 also supports the catch-board I and the extension o of the conveyer-trough N and prevents these parts from sagging.

P represents a conveyer-trough arranged below the drum B and receiving the grain which escapes from the longitudinal discharge opening or slot p of the drum.

P' represents the conveyer-screw arranged in the trough P , and p' is a sprocket-wheel secured to the shaft of the conveyer P' .

Q represents a sprocket-wheel secured to the shaft c' of the separating-reels $C C'$, and $Q' Q^2$ are sprocket-wheels secured to the driving-rollers $B^2 B^3$ of the drum B .

R represents an endless chain which runs around the wheels $Q Q' Q^2 p'$, and whereby the reels $C C'$, rollers $B^2 B^3$, and conveyer P' are driven.

S represents a spur or sprocket wheel secured to the shaft of the cockle-conveyer and which meshes with the sprocket-wheel Q' . By this construction short bends are avoided in the drive-chain, whereby the friction on the chain is reduced. Power is preferably applied to the shaft of the lower conveyer P' .

I claim as my invention—

1. The combination, with the indented drum B , of the separating-reel C , arranged within said drum and provided with elevating-buckets at its tail end, and the reel C' , arranged within the reel C and discharging into the tail of the surrounding reel C , substantially as set forth.

2. The combination, with the feed-hopper E and its discharge-valve G , of the shields F , upon which the hopper is supported, and valve-bearings g , formed partly in the shield and partly in the feed-hopper, substantially as set forth.

3. The combination, with the drum B , conveyer-trough N , provided with an extension o , and the catch-board I , of a guard plate or shield o' , attached to the catch-board and extending below said extension, whereby the material in the drum is prevented from entering between the conveyer-trough and the catch-board, substantially as set forth.

4. The combination, with the shields F , the conveyer-trough N , and the catch-board I , provided with a guard-plate o' , of an angle-iron or strip o^2 , which is supported upon the shields F and upon which the guard-plate rests, substantially as set forth.

Witness my hand this 7th day of May, 1887.

FREDERICK W. HOWELL.

Witnesses:

CARL F. GEYER,
FRED. C. GEYER.