

(No Model.)

2 Sheets—Sheet 1.

F. W. HOWELL.

COCKLE SEPARATOR.

No. 393,829.

Patented Dec. 4, 1888.

Fig. 1.

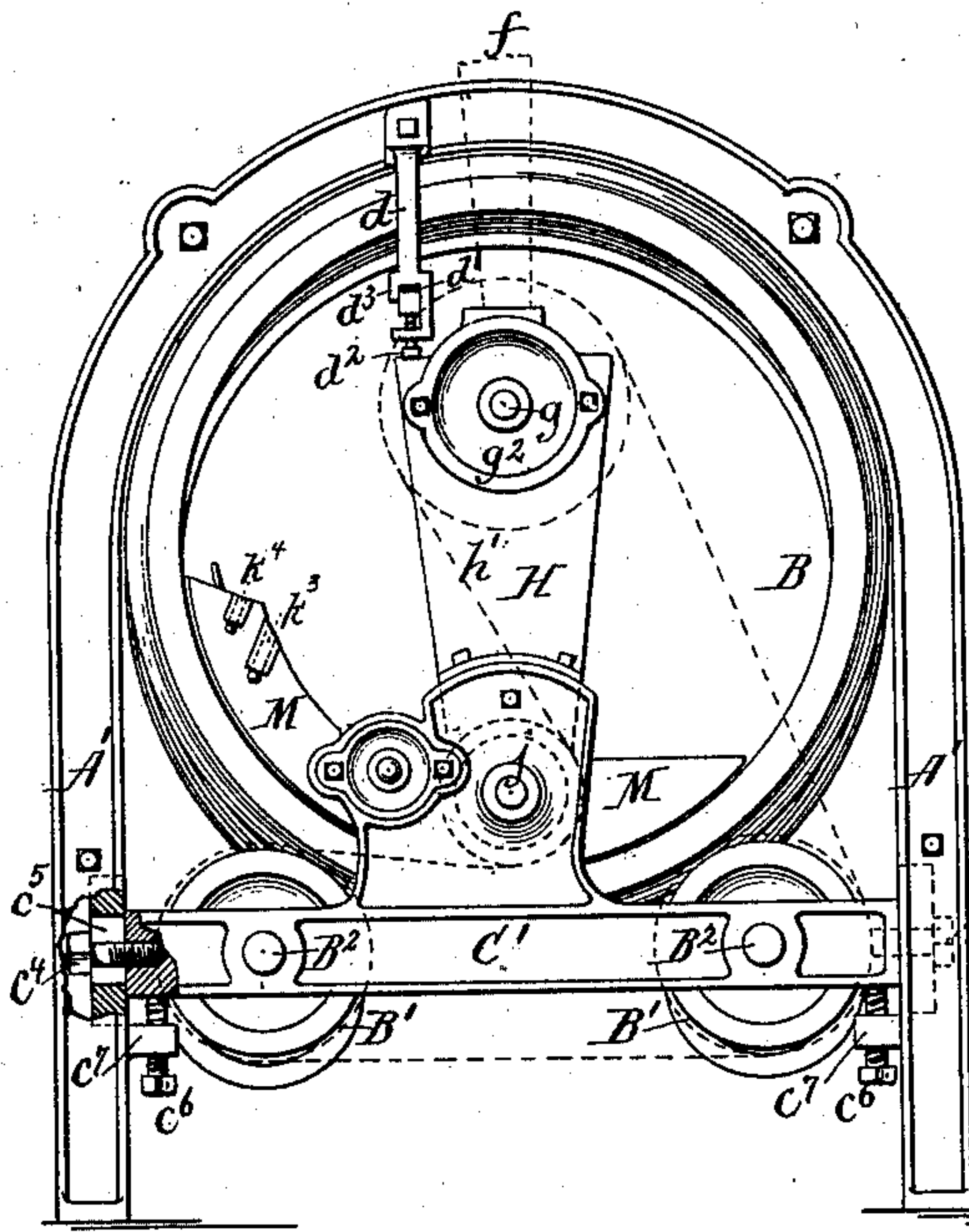


Fig. 2.

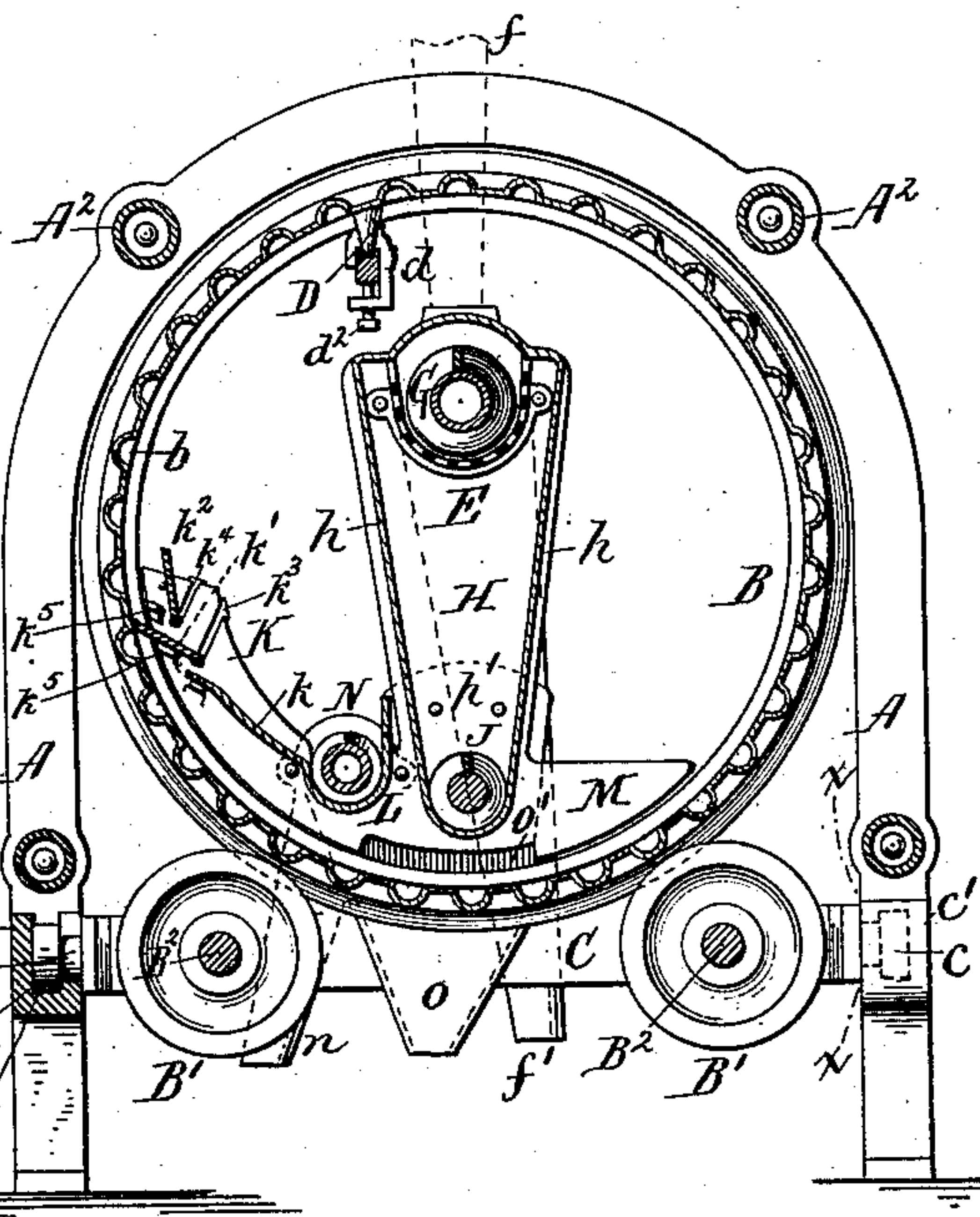
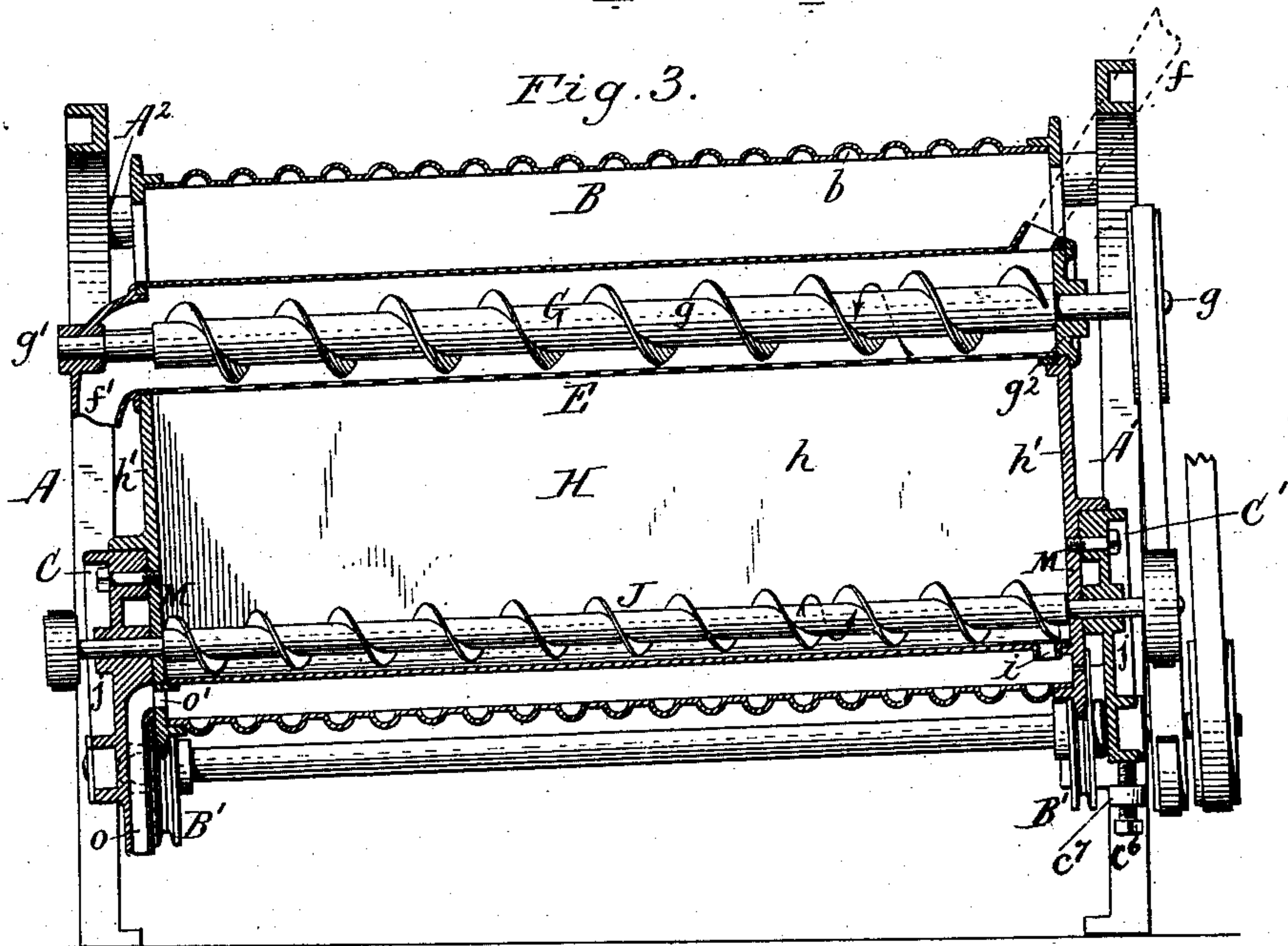


Fig. 3.



Theo. L. Popp  
Geo. J. Buchheit

Witnesses.

F. W. Howell-Inventor.

By Wilhelm Hornet.

Attorneys.

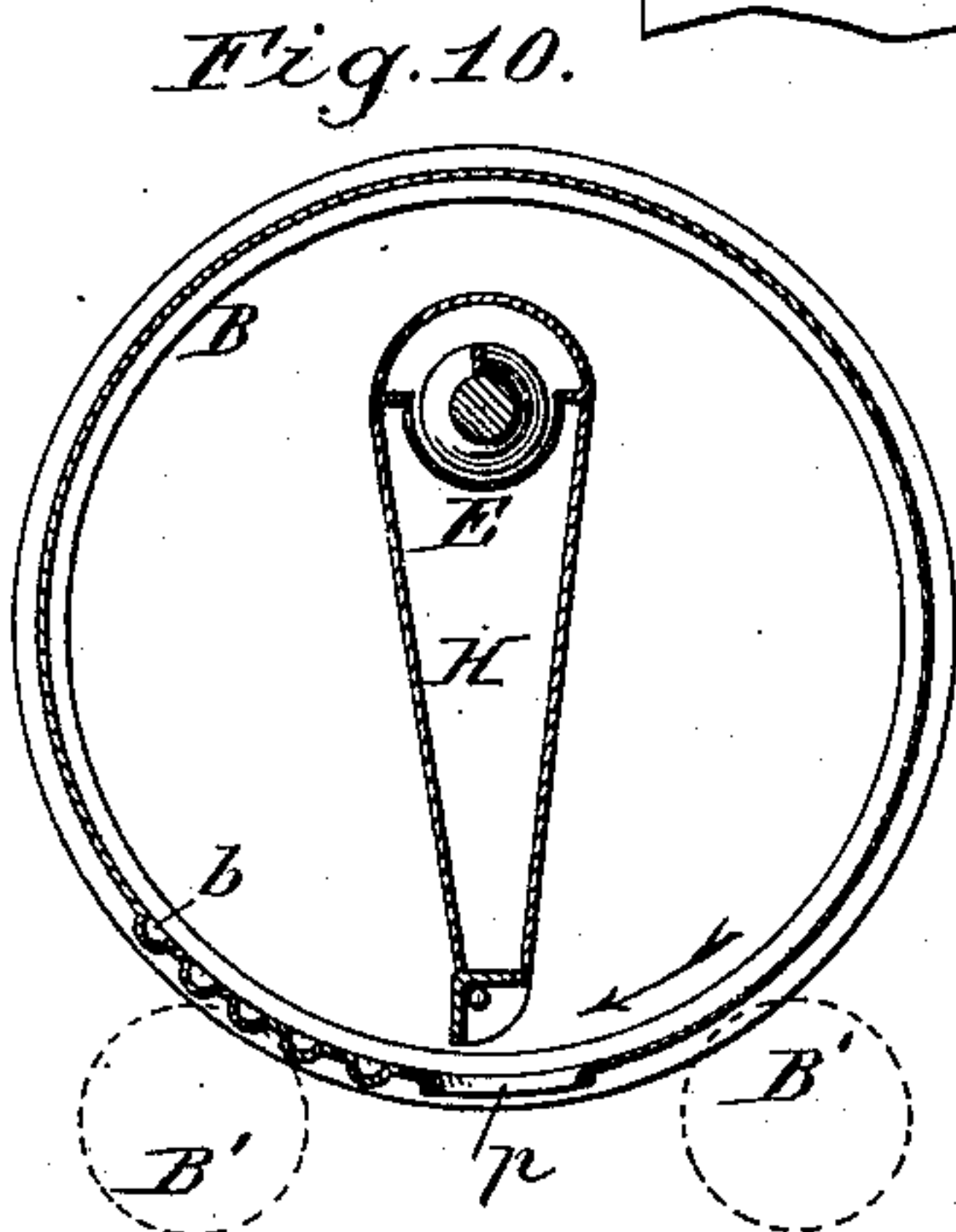
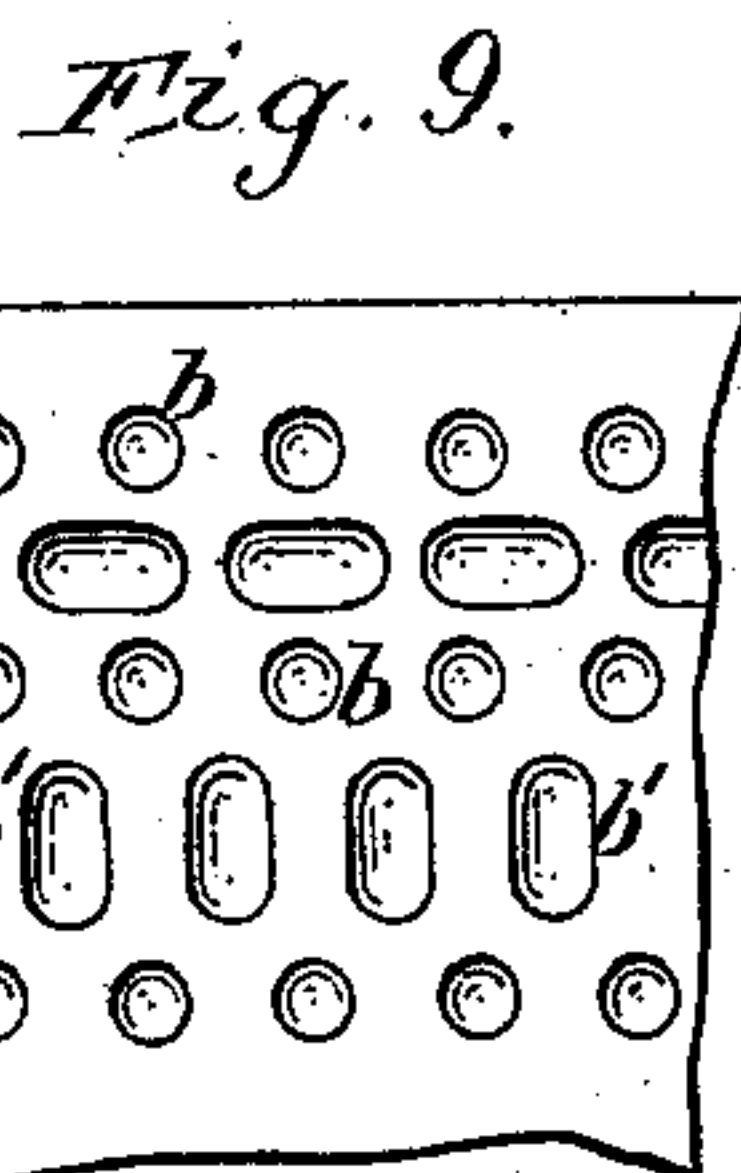
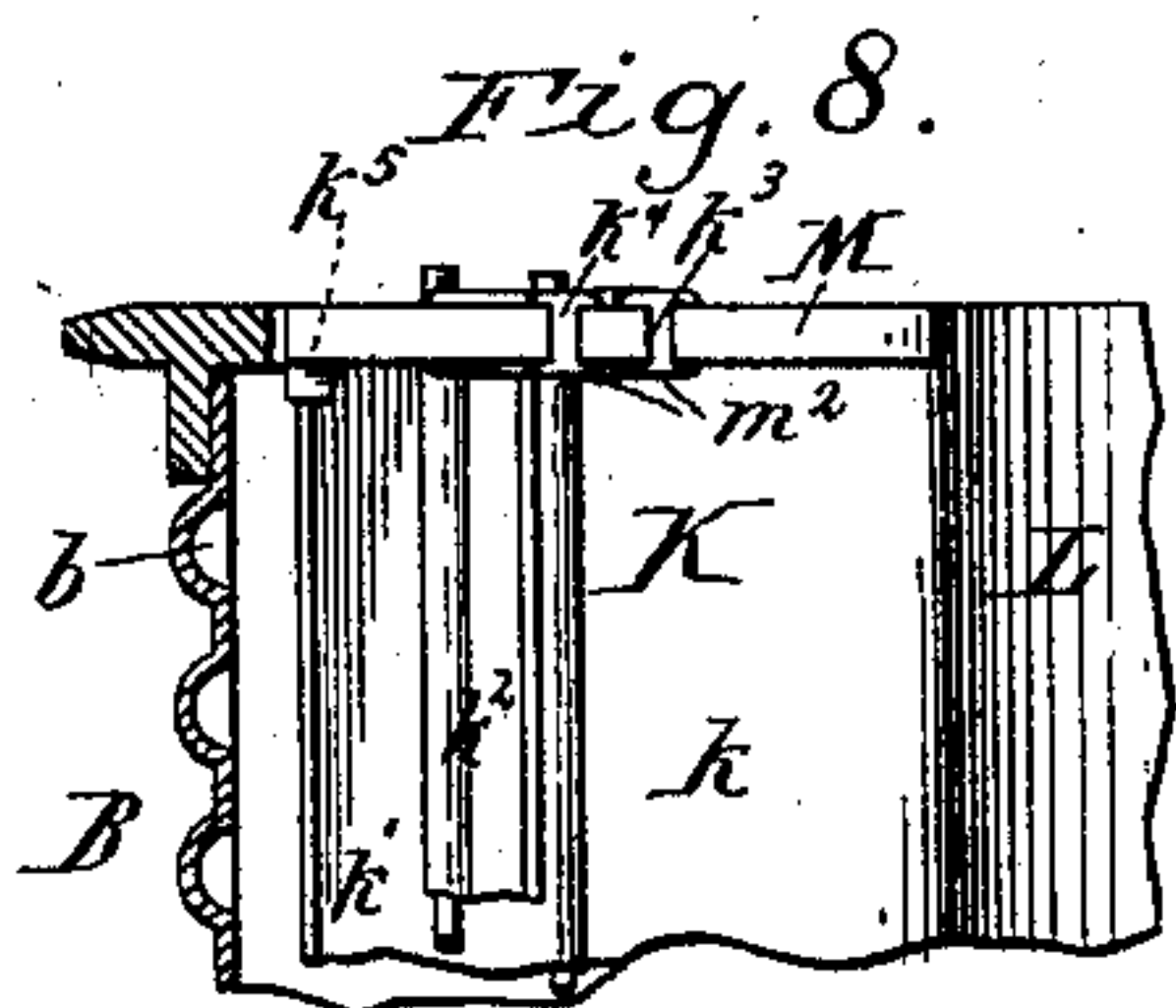
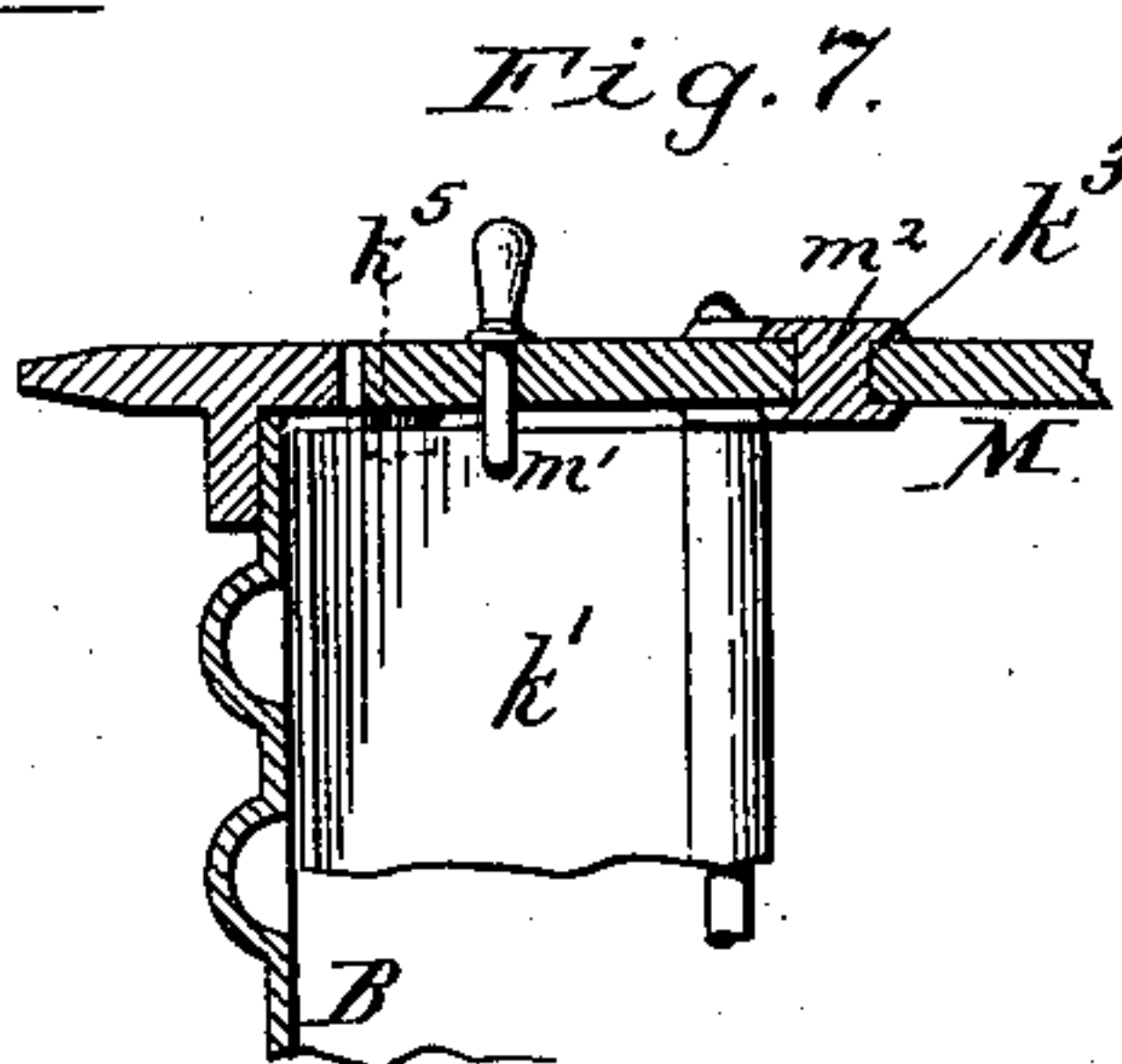
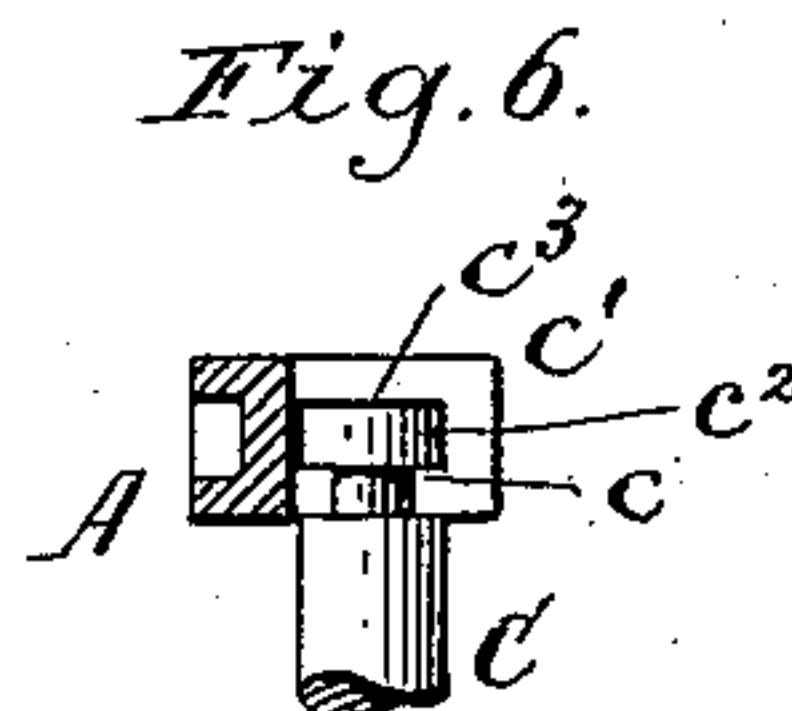
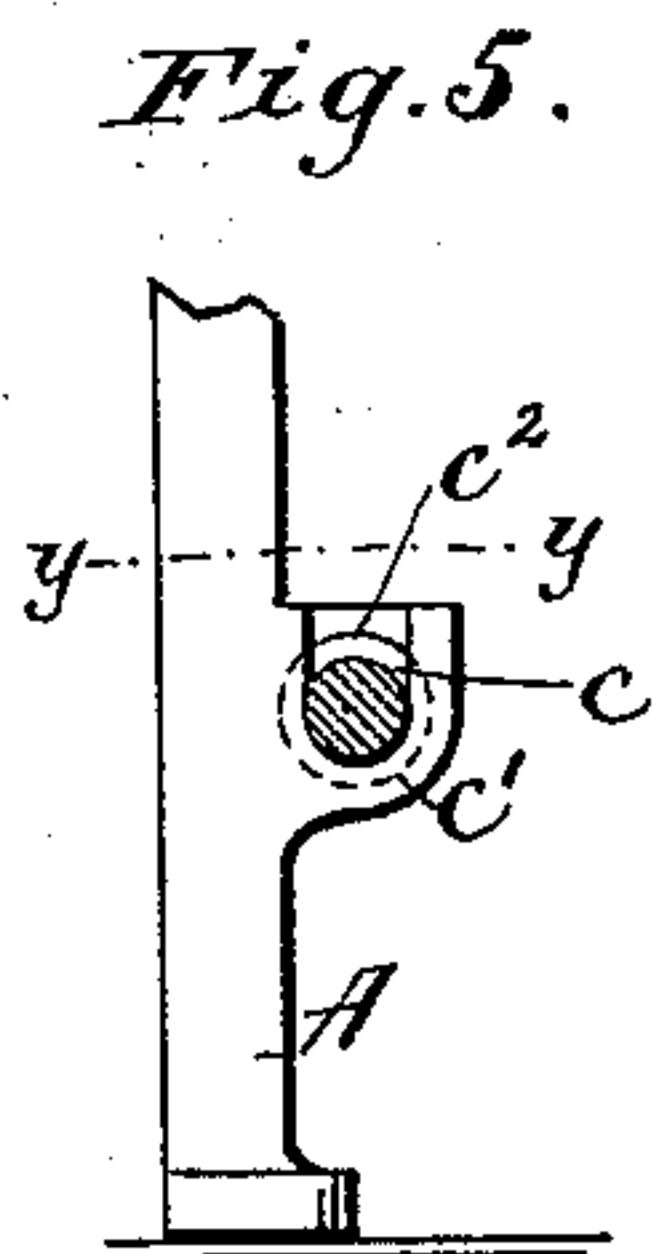
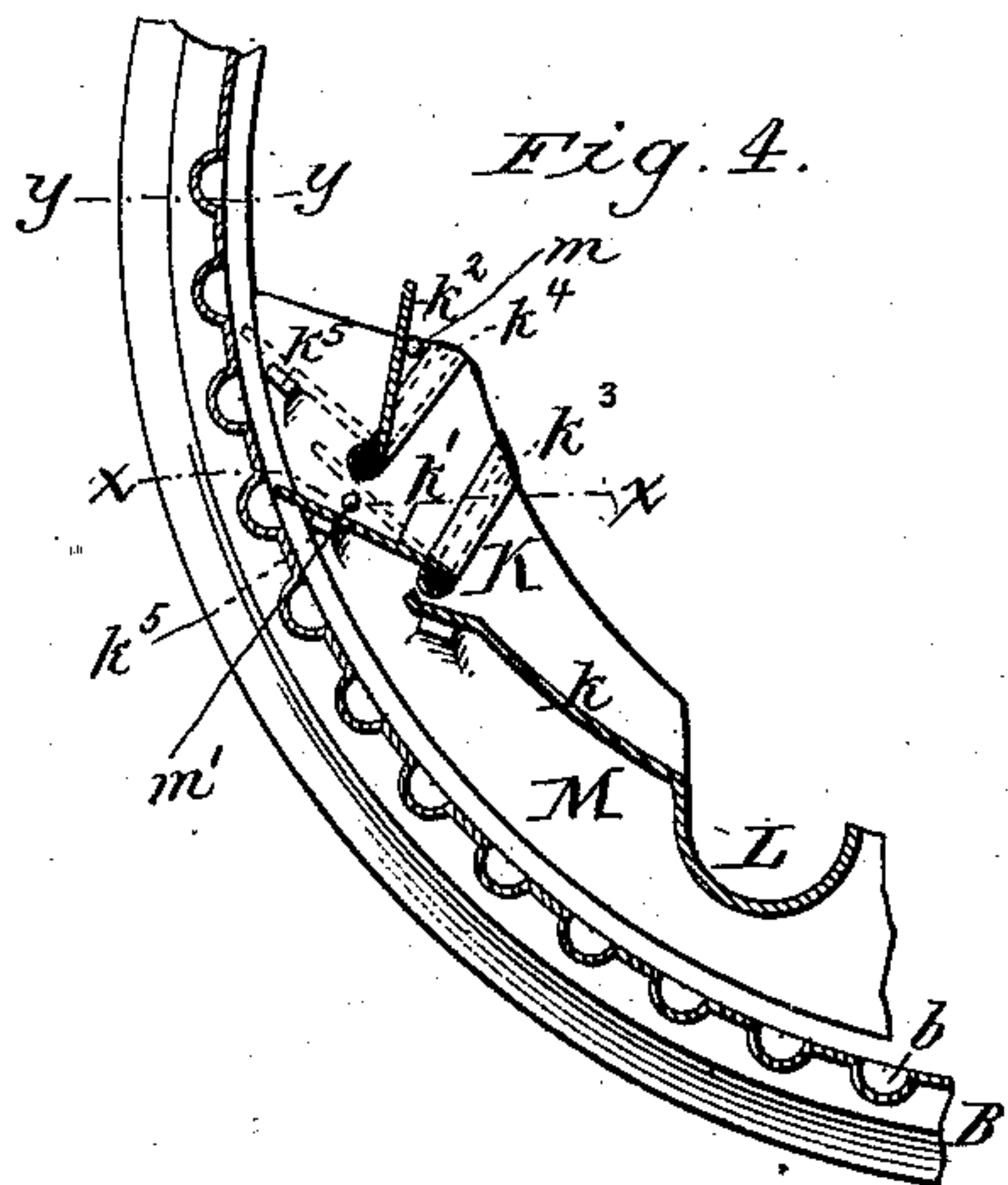
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2 Sheets—Sheet 2.

F. W. HOWELL.  
COCKLE SEPARATOR.

No. 393,829.

Patented Dec. 4, 1888.



Theo. L. Popp.  
Geo. Buchheit *f* Witnesses.

F. W. Howell-Inventor.  
By Wilhelm Ammer,  
Attorneys.



# UNITED STATES PATENT OFFICE.

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

## COCKLE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 393,829, dated December 4, 1888.

Application filed July 12, 1887. Serial No. 244,064. (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  
5 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 consist of a revolving drum provided on its inner  
10 side with pockets, cells, or indentations in which the cockle and other small grain or seeds embed themselves and by which the same are elevated and delivered to a catch-board, while the large grain rolls back and is  
15 separately discharged.

The object of my invention is to simplify the construction of this class of machines, and also to improve the construction thereof.  
20 The invention consists of the improvements which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 represents an elevation of the feed end of the machine. Fig. 2  
25 represents a cross-section of the machine. Fig. 3 is a longitudinal sectional elevation thereof. Fig. 4 is a cross-section of a portion of the separating-drum and the catch-board on an enlarged scale. Fig. 5 is a cross-section in line  $x x$ , Fig. 2. Fig. 6 represents a  
30 horizontal section in line  $y y$ , Fig. 5. Figs. 7 and 8 represent horizontal sections in lines  $x x$  and  $y y$ , Fig. 4. Fig. 9 represents an interior view of a portion of the drum. Fig. 10 represents a modified construction of the machine in cross-section.

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

40 The supporting-frame of the machine is composed of end frames,  $A A'$ , and longitudinal connecting-pieces  $A^2$ .

B represents the separating-drum, provided on its inner surface with cells or indentations  
45  $b$ , and  $B'$  represents the rollers supporting the drum. The rollers  $B'$  are mounted upon horizontal shafts  $B^2$ , which are journaled in cross-pieces or horizontal frames  $C C'$ , attached to the end frames,  $A A'$ . The frame  $C$  at the  
50 tail end of the machine is pivoted to the end

frame  $A$  by means of journals  $c$ , formed at the ends of the frame  $C'$  and arranged in sockets or bearings  $c'$ , formed in the end frame. The journals  $c$  are provided with heads  $c^2$ , which rest in enlargements  $c^3$  of the sockets  
55  $c'$ , and whereby the journals  $c$  are retained in their sockets and the sides of the end frames  $A$  are rigidly connected together. The horizontal frame  $C'$  at the feed end of the machine is made vertically adjustable on the end  
60 frame  $A'$ , so that by raising or lowering the frame  $C'$  the pitch of the drum can be adjusted to cause the material to pass through the drum with greater or less speed, as may be desired. The adjustable frame  $C'$  is con-  
65 nected with the stationary frame  $A'$  by horizontal bolts  $c^4$ , attached to the horizontal frame and pass through vertical slots  $c^5$ , formed in the end frame  $A'$ , in which slots the bolts move as the horizontal frame is  
70 raised and lowered.

$c^6$  represents vertical set-screws arranged in lugs  $c^7$ , formed on the end frame  $A'$  and bearing against the under side of the frame  
75  $C'$ , and whereby the latter is raised and lowered.

$D$  represents a brush arranged lengthwise within the drum  $B$  and bearing against the inner surface thereof. The brush  $D$  is supported by hangers  $d$ , secured to the top portions of the end frames,  $A A'$ , the hangers being provided with a vertically-elongated opening,  $d'$ , in which the ends of the brush are supported by means of set-screws  $d^2$ . The lower portion of each opening  $d'$  extends  
85 through one side of the hanger, as clearly represented in Figs. 1 and 2, so that the brush can be inserted and removed in a lateral direction through the lower portions of said openings, and is confined in the hanger when  
90 elevated in the openings by the overhanging lips  $d^3$  on one side of the hangers.

$E$  represents a perforated separating-trough arranged within the drum  $B$  and extending from end to end thereof, and whereby the  
95 large grain is separated from the small grain and cockle. The separating-trough  $E$  is constructed of wire-cloth or perforated metal of the proper mesh to effect this separation.

$f$  represents the feed-spout, arranged at the 100



front end of the separating-trough E; and  $f'$  is the discharge-spout, arranged at the rear end of the same.

G represents a conveyer arranged in the separating-trough E and which moves the material from the feed-spout  $f$  to the discharge-spout  $f'$ , the small grain and cockle passing through the perforations of the separating-trough, while the larger grain is conducted to the discharge-spout  $f'$ . The shaft  $g$  of the conveyer G is supported at one end in a bearing,  $g'$ , formed in the discharge-spout  $f'$ , and at its opposite end in a cap,  $g^2$ , which closes the front end of the separating-trough E.

H represents the feed-hopper, arranged lengthwise within the drum B underneath the separating-trough E, and receiving the small grain and cockle passing through the perforations of the separating-trough.

The hopper H is composed of side plates,  $h$ , and end plates,  $h'$ , which latter are secured to the movable frames C C', so as to move with said frames in adjusting the same.

$i$  represents an opening formed in the bottom of the feed-hopper H at or near the feed end of the machine, and through which the material contained in the hopper is discharged upon the head of the indented drum B.

J is a conveyer arranged in the bottom of the feed-hopper H, and which conducts the material in the hopper to the discharge-opening  $i$ . The conveyer J is mounted in suitable bearings,  $j$ , formed in the frames C C'.

K represents the inclined catch-board, arranged within the drum B on the ascending side thereof; and L is the conveyer-trough, which receives the material from the catch-board. The conveyer-trough L and catch-board K are supported at their ends in plates or shields M, which are arranged concentric with the inner surface of the drum B and secured respectively to the frames C C'. The catch-board K is composed of a lower stationary section or plate,  $k$ , extending upwardly from the conveyer-trough L, and two pivoted receiving-plates,  $k'$   $k^2$ , arranged one above the other and above the upper edge of the stationary part  $k$ . The plates  $k'$   $k^2$  are pivoted at their lower ends in slots  $k^3$   $k^4$ , formed in the upper portion of the shields M M', one above the other, and are supported at their upper ends upon lugs or projections  $k^5$ , formed on the inner sides of said shields.

When the machine is used for separating material containing small grain, it is necessary to elevate the material to a greater height to cause the grain to fall out of the cells of the drum than when separating material containing large grains. In separating large material the lower receiving-plate,  $k'$ , is swung into the position represented in full lines in Figs. 2 and 4 and the upper plate is swung away from the inner surface of the drum, in which position the upper plate rests against lugs  $m$ , formed on the inner sides of the shields M M'. When treating material containing small grain, the upper receiving-plate,  $k^2$ , is

swung into the position represented by dotted lines in Fig. 4 and the lower plate is swung away from the drum, as indicated by dotted lines in the same figure, and supported by pins  $m'$ , which are inserted in openings formed in the side of the shields M M'. In this case the upper end of the lower plate,  $k'$ , is arranged under the lower end of the upper plate,  $k^2$ , and forms a continuation of the latter and conducts the grain to the stationary part  $k$  of the catch-board. The slots  $k^3$   $k^4$ , in which the plates  $k'$   $k^2$  are pivoted, are closed by blocks or plates  $m^2$  after the pivots of said plates have been inserted into the slots, to prevent the grain from escaping through these slots.

It is obvious that one of the pivoted plates  $k'$   $k^2$  may be dispensed with, if desired, and a single pivoted plate be employed, which is placed in the upper slots,  $k^3$ , when treating small material, or in the lower slots,  $k^4$ , when separating large material.

N represents a conveyer arranged in the trough L, and whereby the cockle and other small seeds or grains are delivered into the discharge-spout  $n$  of the trough.

$o$  represents a spout arranged at the tail end of the drum B, and into which the separated grain is discharged from the tail end of the drum through an opening,  $o'$ , formed in the bottom of the adjacent shield M, the material being caused to travel toward the discharge-opening  $o'$  by the inclined position of the separating-drum.

When the drum is designed to elevate grains or seeds of different forms—for instance, cockle and small wheat—it is provided with alternating cells or indentations of different forms corresponding to the forms of the seeds of grains to be elevated, the different kinds of indentations being arranged in the same peripheral zone or division of the drum, whereby each kernel in rolling on the inner surface of the drum strikes successively different kinds of indentations and thereby changes its position repeatedly until it enters the indentations corresponding with its form or size—for instance, the cockle continues to roll until it enters a round indentation,  $b$ , which elevates the cockle, and the small wheat continues to roll until it enters an elongated indentation,  $b'$ , which elevates the small wheat. This construction is represented in Fig. 9. This construction is especially adapted for separating cockle and small wheat from oats when the bulk of the grain consists of oats, the cockle and small wheat being elevated and discharged together upon the catch-board, while the oats are rejected by the indentations and roll back and are finally discharged from the tail end of the drum or otherwise.

In the modified construction of the machine represented in Fig. 10 the feed-hopper H is provided in its bottom with a longitudinal discharge-opening, through which the material in the hopper is intermittently discharged upon the inner surface of the drum, and the



latter is provided with a longitudinal opening or slot, *p*, through which the separated grain is discharged from the drum, these discharge devices being constructed substantially as described and shown in Letters Patent of the United States No. 346,815, granted to me August 3, 1886.

I claim as my invention—

1. The combination, with the drum B and the supporting-rollers B', of the end frame A, and the horizontal frame C, pivoted thereto, the end frame A', provided with vertical slots *c*<sup>5</sup>, the adjustable frame C', having horizontal bolts *c*<sup>4</sup>, arranged in said slots, and set-screws *c*<sup>6</sup>, whereby the frame C' is adjusted, substantially as set forth.

2. The combination, with the separating-drum, of the main frame A, provided with sockets *c*', having enlargements *c*<sup>3</sup>, and the horizontal frame C, provided with journals *c*, having enlarged heads *c*<sup>2</sup>, the vertically-adjustable frame C', and the supporting-rollers B', substantially as set forth.

3. The combination, with the brush D, of hangers *d*, provided with set-screws *d*<sup>2</sup> and an opening, *d*', extending through the hangers on one side thereof, substantially as set forth.

4. The combination, with the indented separating-drum B, of the perforated separating-trough E, arranged lengthwise within the drum, a conveyer, G, arranged within said separating-trough, and a hopper arranged underneath the perforated trough and provided in its bottom with an opening through which the material is discharged upon the inner surface of the separating-drum at the head thereof, substantially as set forth.

5. The combination, with the indented sepa-

rating-drum B, of the perforated separating-trough E and conveyer G, arranged within the drum, a hopper, H, arranged below the perforated trough, and a conveyer, J, arranged in the hopper H and delivering the material in said hopper upon the head of the separating-drum, substantially as set forth.

6. The combination, with the indented separating-drum, of a preliminary separator arranged lengthwise within said drum, a receiving-hopper arranged within the drum underneath said preliminary separator, and a screw-conveyer arranged on the bottom of said receiving-hopper, whereby the material is delivered from said hopper upon the inner surface of the separating-drum at the head thereof, substantially as set forth.

7. The combination, with the indented separating-drum and the supporting-frame, of shields or end plates provided in the same peripheral zone with slots *k*<sup>3</sup> *k*<sup>4</sup>, a stationary catch-board, and an adjustable receiving-plate removably seated in said slots, substantially as set forth.

8. In a cockle-separator, an indented separating-drum provided in the same peripheral zone with alternating indentations of different elevating capacities, substantially as set forth.

9. In a cockle-separator, an indented separating-drum provided in the same peripheral zone with alternating round and elongated indentations, substantially as set forth.

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

FREDERICK W. HOWELL.

Witnesses:

CARL F. GEYER,  
FRED. C. GEYER.

It is hereby certified that in Letters Patent No. 393,829, granted December 4, 1888, upon the application of Frederick W. Howell, of Buffalo, New York, for an improvement in "Cockle-Separators," an error appears in the printed specification requiring the following correction: In lines 58-59, page 3, the words "in the same peripheral zone," should be stricken out, and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 18th day of December, A. D. 1888.

[SEAL.]

H. L. MULDROW,  
*First Assistant Secretary of the Interior.*

Countersigned:

BENTON J. HALL,  
*Commissioner of Patents.*