

(No Model.)

2 Sheets—Sheet 1.

A. P. HOLCOMB & A. HEINE.

CENTRIFUGAL FLOUR BOLT.

No. 285,620.

Patented Sept. 25, 1883.

Fig. 1.

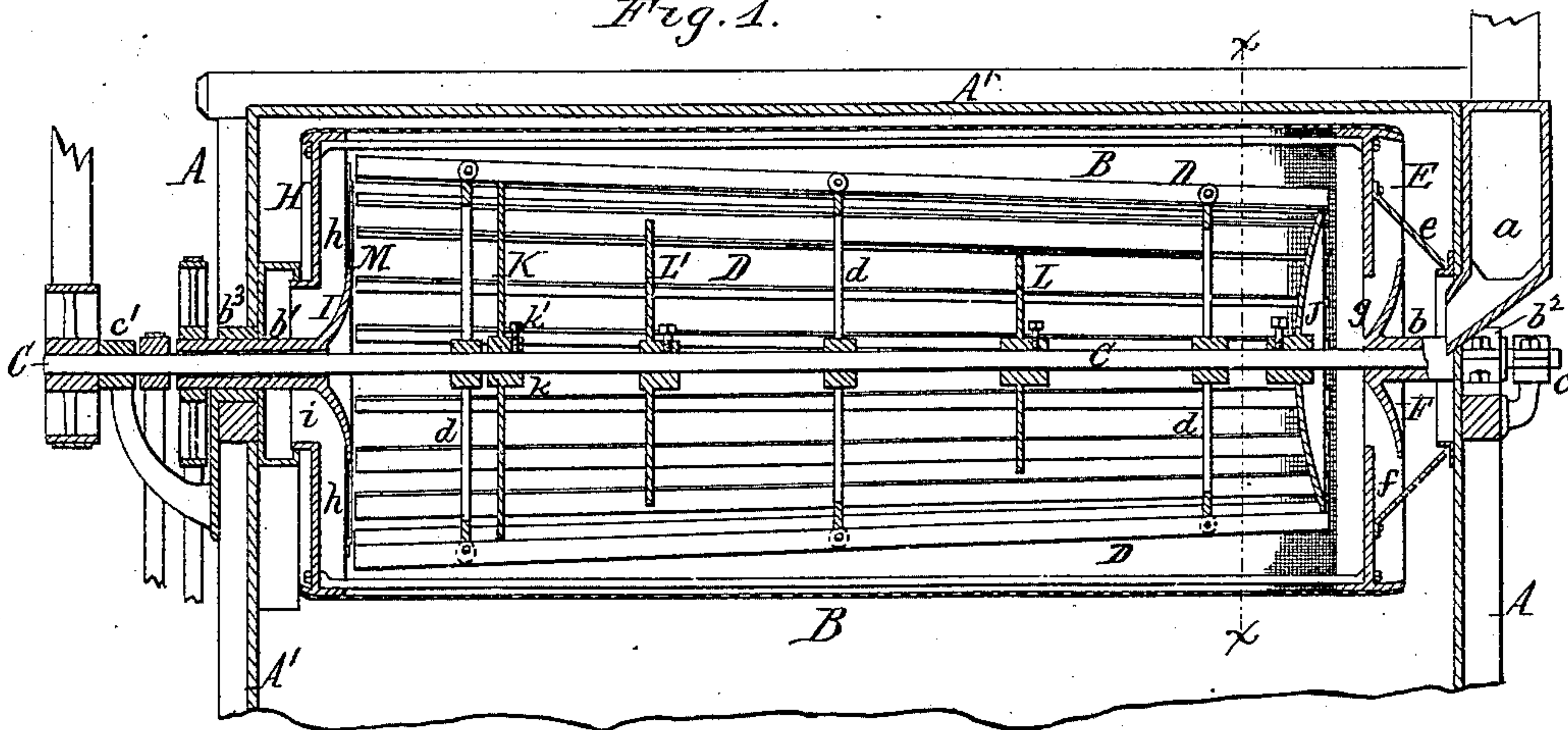


Fig. 2.

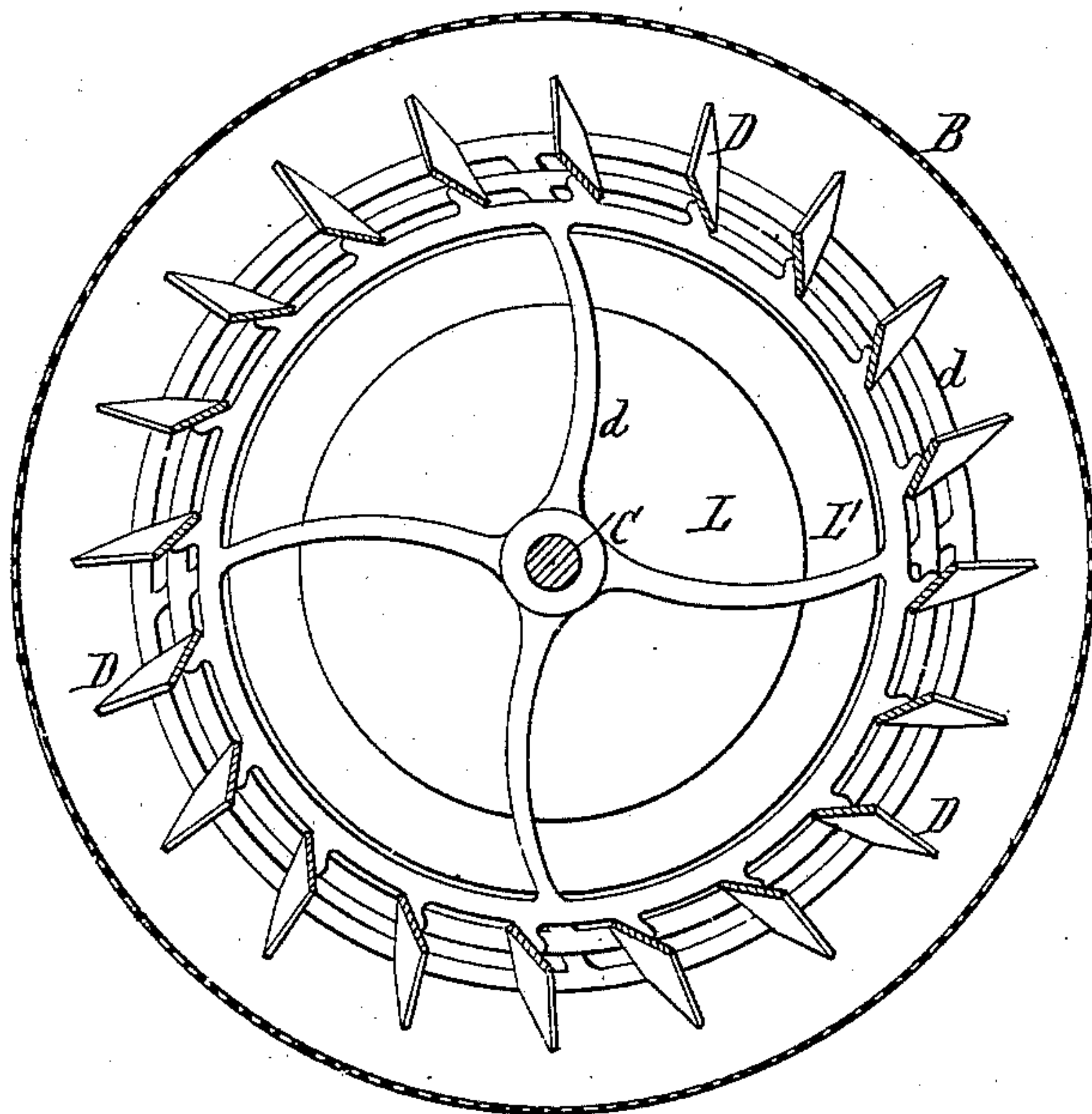
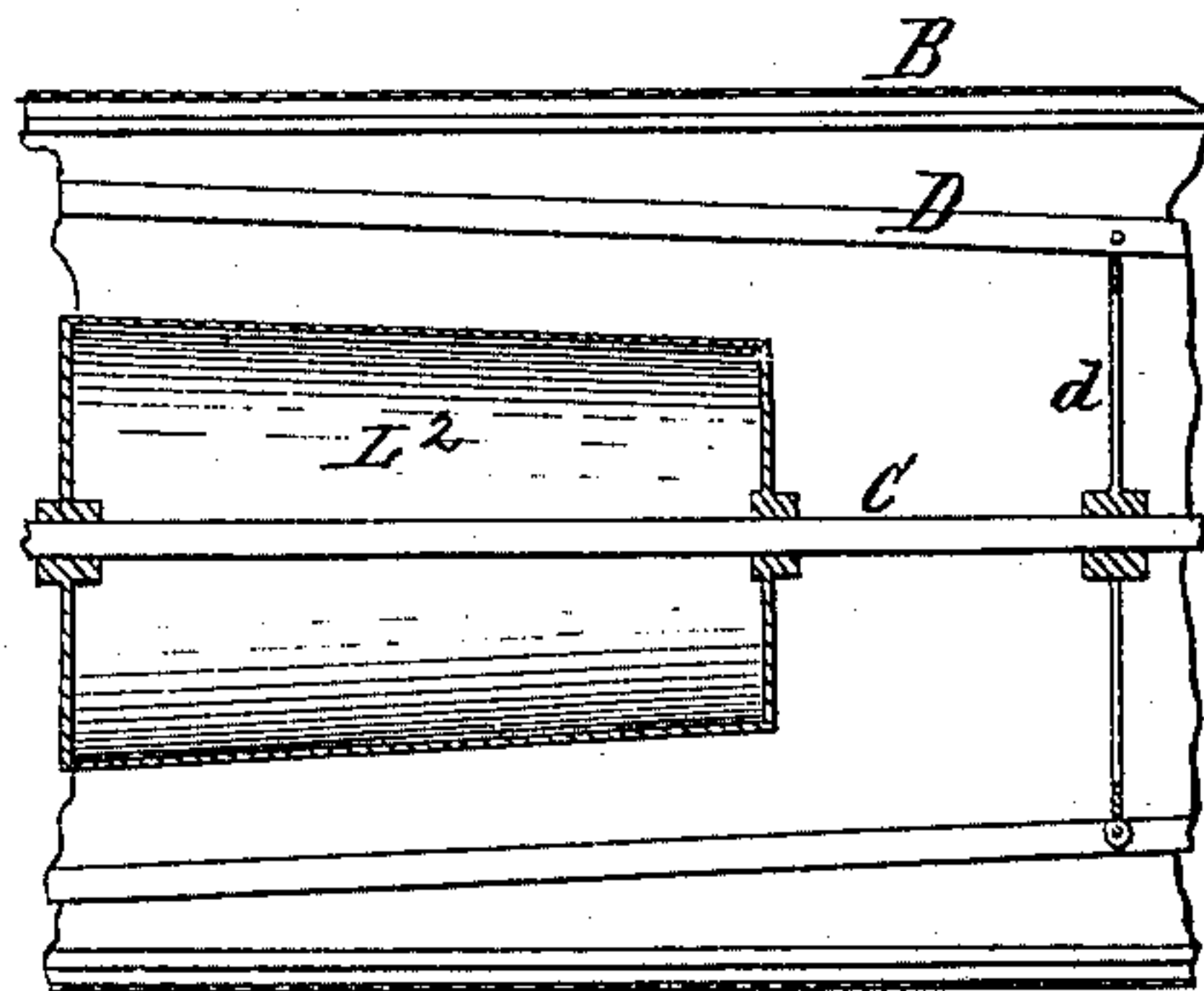


Fig. 3.



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Edw. J. Brady } Witnesses.

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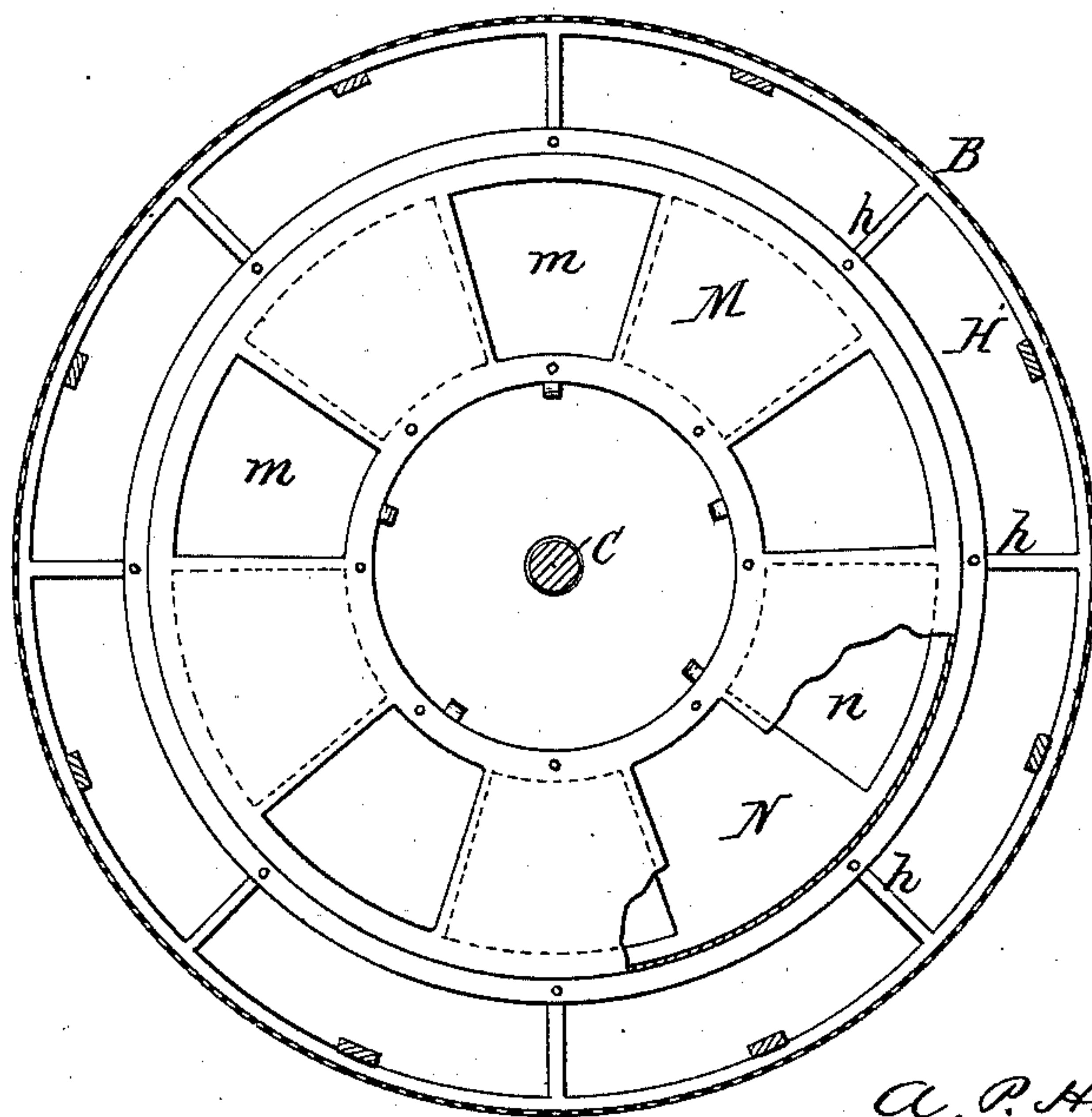
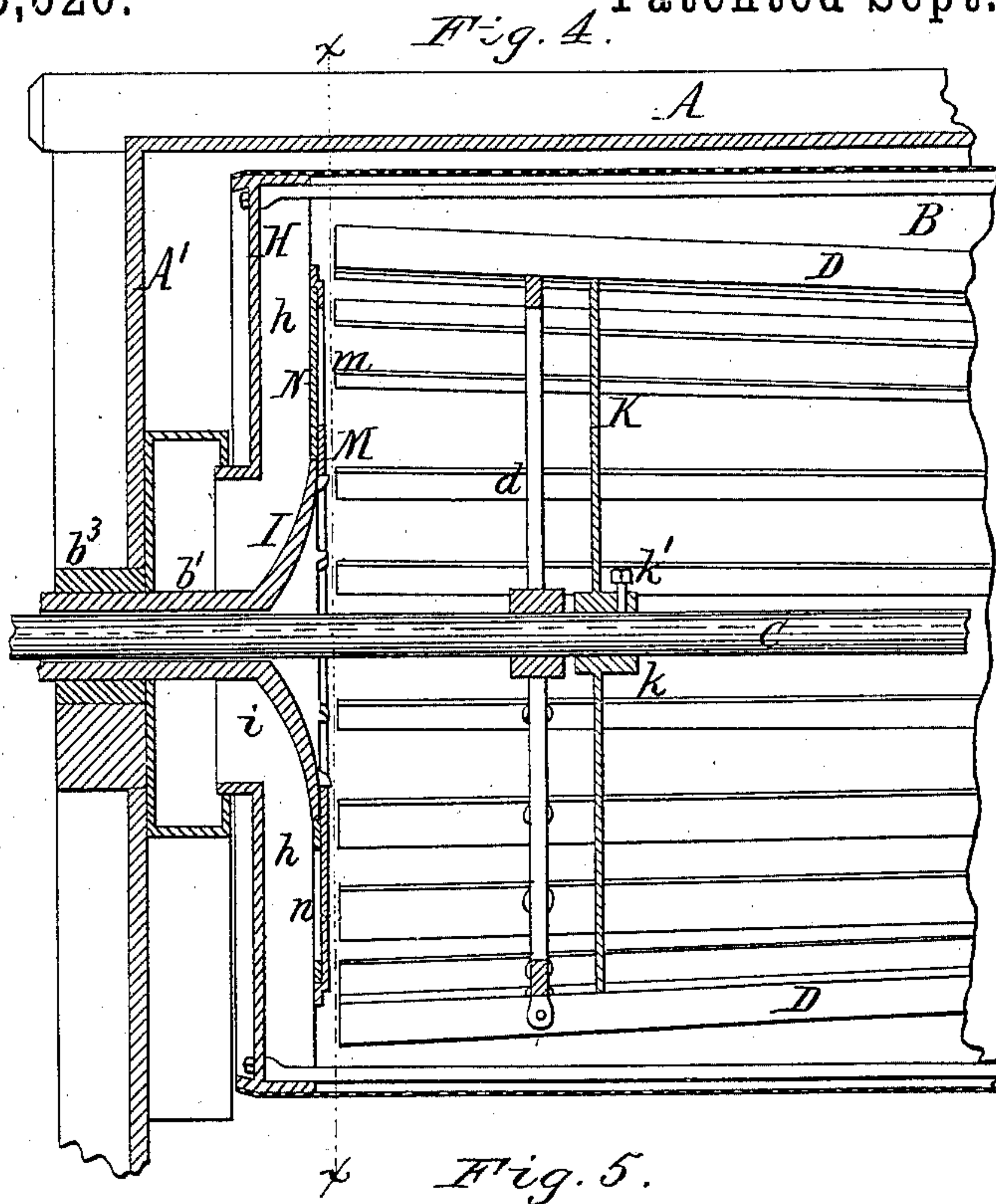
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A. P. Holcomb
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UNITED STATES PATENT OFFICE.

ABEL P. HOLCOMB AND AUGUST HEINE, OF SILVER CREEK, NEW YORK.

CENTRIFUGAL FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 285,620, dated September 25, 1883.

Application filed June 23, 1883. (No model.)

To all whom it may concern:

Be it known that we, ABEL P. HOLCOMB and AUGUST HEINE, both of Silver Creek, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Centrifugal Flour-Bolts, of which the following is a specification.

This invention relates to certain improvements in the construction of centrifugal bolts, whereby the separation of the offal from the valuable particles is improved.

In centrifugal bolts as heretofore constructed the air-currents created in the bolt by the rotating beaters have a tendency to draw the light material toward the axis of the bolt and to force the heavier material toward the bolting-cylinder. This light material contains valuable particles which should be bolted out and separated from the bran or offal; but ordinarily they pass off with the latter at the tail of the bolt. If the light material is crowded toward the bolting-cloth before the heavy material has been bolted out, the impurities contained in the light material will lower the grade of the heavy material, and this should be avoided.

The object of our invention is to construct the bolting apparatus in such manner that the bolting-surface is fully utilized and the creation of disturbing air-currents avoided, also so that the heavy material is first completely bolted out before the light material is sent to the bolting-surface, thereby avoiding the mixture of impurities with the bolted heavy material, and so that the valuable light material is bolted out before the tailings are permitted to escape, and so that the operation of the machine can be regulated to perform the desired separation.

Our invention consists, to these ends, of the improvements in the construction of the bolt, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal section of a centrifugal bolt provided with our improvements. Fig. 2 is a cross-section on an enlarged scale in line *x x*, Fig. 1, looking toward the tail end of the bolt. Fig. 3 is a fragmentary horizontal section of the bolt, illustrating a modified construction of the same.

Fig. 4 is vertical section of the tail end of the bolt on an enlarged scale. Fig. 5 is a cross-section on line *x x*, Fig. 4.

The same letters of reference refer to the same or corresponding parts in the several figures.

A represents the frame of the machine, and A' the casing secured thereto. *a* represents the feed-spout, and B the bolting-cylinder, provided with hollow trunnions *b b'*, which turn in bearings *b² b³*.

C represents the beater-shaft, turning in bearings *c c'*, and D the beaters, secured to the shaft C within the bolting-cylinder by arms or spiders *d*.

E represents the annular head or disk arranged at the feed end of the bolting-cylinder, and provided with a hood, *e*, which receives the material to be bolted from the feed-spout *a*.

f represents ribs secured to the outer side of the head E in the hood *e*, whereby the material is elevated; and F represents the deflector, whereby the material which has been elevated by the ribs *f* is deflected through the central opening, *g*, in the head E into the bolting-cylinder.

H represents the annular head, arranged at the tail end of the bolting-cylinder, and *h* are ribs formed on the inner side of the head H, for elevating the tailings to the central discharge-orifice, *i*, through which they are discharged by the deflector I.

The beaters D are arranged nearest the axis of rotation at the feed end and farthest from said axis at the discharge end of the cylinder, as clearly represented in Fig. 1, so that the distance from the beaters to the bolting-surface is greatest at the feed end and smallest at the discharge end, whereby the space in which the heavy material can separate from the light material is made greatest near the feed end of the cylinder, where the bulk of the material is greatest, and gradually diminishes toward the discharge end of the cylinder in the same measure as the bulk of the material decreases by the removal of the material which is bolted out. In the construction represented in the drawings this result is effected by arranging the beaters conically in a cylindrical bolting-case; but the same effect can be attained by arranging the beaters cylindrically in a conical

cal bolting-case decreasing in diameter from the feed toward the discharge end. The angle at which the beaters are arranged with reference to radial lines drawn through the inner edges of the beaters is greater at the feed end than at the discharge end of the beaters, as represented in Fig. 2; or, in other words, the inclination of each beater with reference to the line in which they move is steeper near the tail end than at the receiving end, whereby the material is held longer on the beaters near the discharge end, where a more intense beating action is required, than at the feed end, owing to the diminished quantity of valuable stock contained in the material near the discharge end of the machine.

J represents a disk surrounding the shaft C on the inner side of the head E, opposite the feed-opening *g*, and extending outwardly to the beaters D. The disk J is made concave on the side facing the head E, whereby ample room is afforded for the entrance of the material from the opening *g*, and the material is directed backward to the extreme head end of the bolting-surface. The entire bolting-surface is thereby utilized and the material prevented from flowing through the bolting-cylinder in the direction of the axis, while the centrifugal effect of the beaters is neutralized, so that air is neither drawn inward nor blown out through the feed-opening *g*.

K represents a circular head or disk surrounding the shaft C near the discharge-head H. The head K compels the material to pass to the bolting-cloth before it is picked up by the ribs *h*, and consequently subjects the light material to the separating action of the bolting-cloth and insures the bolting out of the light flour stock contained in the material. The light floating material has a tendency to pass through the bolting-cylinder in a zone surrounding the shaft C, and the fine flour stock contained in this material would pass off with the tailings if it were not brought within reach of the beaters and bolting-cloth by the head K. The latter is secured to the shaft C by a hub, *k*, and set-screw *k'*, or other suitable means, so that it can be adjusted longitudinally on the shaft C, thereby affording means for regulating the point at which the light material begins to bolt through. As this light material is more liable to carry impurities with it than the heavier stock which is bolted through the head portion of the reel, the head K will be so adjusted in the reel that it will cause the light material to be bolted through after all of the heavy material has been bolted out. The different grades are removed separately by the usual conveyers and slides with which the machine is provided. This operation can be further regulated by intermediate heads, L L', secured to the shaft C between the heads J and K, and increasing in diameter toward the tail end of the machine, whereby the light material is gradually brought

nearer the bolting-cloth as it travels through the bolting-cylinder from the head toward the tail thereof. If desired, a tapering drum, L², may be substituted for the intermediate heads, L L', as represented in Fig. 3; but this is not so desirable, as it occupies valuable space in which the material would separate, according to fineness and gravity.

M represents a disk, head, or annular plate, which is secured to the inner sides of the ribs *h*, and which extends from the deflector I to the inner edges of the beaters D, or thereabout, the disk being made of such size that it will neutralize the air-currents created by the beaters, so that the air will be quiescent or stationary in the discharge-orifice *i* and the passages connecting therewith, thereby insuring the free discharge of the tailings without drawing out light material which should be bolted out. When the machine is used for bolting light tailings, and the object is to separate from the bran all the flour stock, irrespective of grade, the disk M should be tight to prevent the escape of any light floating flour stock; but when the machine is used for rebolting flour the object is to exclude all specks and other light impurities from the material which is bolted through, and the presence of the tight head would retain the light floating material in the reel and cause specks to be bolted through near its tail end. In order to avoid this we construct the head M in the form of a register, with openings which can be opened and closed at desire, as clearly represented in Figs. 4 and 5.

m represents the openings formed in the head M, and N represents the movable plate arranged between the head M and the ribs *h*, and provided with similar openings, *n*, so that by adjusting the plate N the openings *m* can be covered or uncovered, as may be desired. When the machine is used for rebolting flour, or for other work in which a high grade in the bolted material is more desired than a large yield, the openings *m* are opened, thereby permitting the floating material to pass through these openings into the discharge-orifice *i*. When the machine is used for bolting tailings, or other work having the object of separating all the flour stock from the material, the openings *m* are closed, thereby compelling all the floating material to pass to the bolting-cloth and beaters before escaping from the reel. The plate N is readily reached by opening a portion of the lacing in the longitudinal joint of the bolting-cloth. The head K and the intermediate heads, L L', may be constructed in the form of registers, if preferred.

We claim as our invention—

1. The combination, with a bolting-case, of revolving beaters arranged in the same at a greater distance from the bolting-surface at the head than at the tail of the case, substantially as set forth.

2. The combination, with a cylindrical bolting-case, of revolving beaters arranged con-

cally in the case and approaching the bolting-surface from the head toward the tail of the case, substantially as set forth.

5 3. The combination, with a bolting-case, of revolving beaters arranged in the tail portion of the case at a smaller angle backward from radial lines drawn through the inner edges of the beaters than in the front portion of the case, substantially as set forth.

10 4. The combination, with a bolting-case having a central feed-opening and revolving beaters, of a dished head arranged with its concave side opposite the feed-opening, substantially as set forth.

15 5. The combination, with a bolting-case and revolving beaters, of a head or disk, K, arranged near the tail end of the case and made lengthwise adjustable in the same, substantially as set forth.

20 6. The combination, with a bolting-case and revolving beaters, of a series of deflecting-disks surrounding the beater-shaft and increasing in diameter from the head toward the tail of the case, substantially as set forth.

25 7. The combination, with a bolting-case having a central feed-opening and revolving beaters, of a head, J, arranged opposite the feed-opening, and heads L L' K, increasing in diameter from the head toward the tail end of
30 the case, substantially as set forth.

8. The combination, with a bolting-reel and

the conduit through which the tailings are discharged, of a head located in the tail portion of the reel, and having adjustable openings whereby the discharge of the floating material
35 can be regulated, substantially as set forth.

9. The combination, with a bolting-case and beaters revolving therein, of a head, H, having a central discharge-orifice, *i*, means whereby the tailings are elevated from the bolting-cloth
40 to the discharge-orifice, and a head, M, arranged on the inner side of the head H, whereby disturbing air-currents in the discharge-passage are prevented, substantially as set forth.

10. The combination, with a bolting-case
45 and beaters revolving therein, of a head, H, having ribs *h*, a deflector, I, and a central discharge-orifice, *i*, and a head, M, arranged against the inner sides of the ribs *h*, substantially as and for the purpose set forth. 50

11. The combination, with a bolting-case and beaters revolving therein, of a head, H, having ribs *h*, a deflector, I, and a central discharge-orifice, *i*, and a head, M, secured to said ribs and provided with adjustable open-
55 ings, substantially as set forth.

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AUG. HEINE.

Witnesses:

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S. U. NEWTON.