

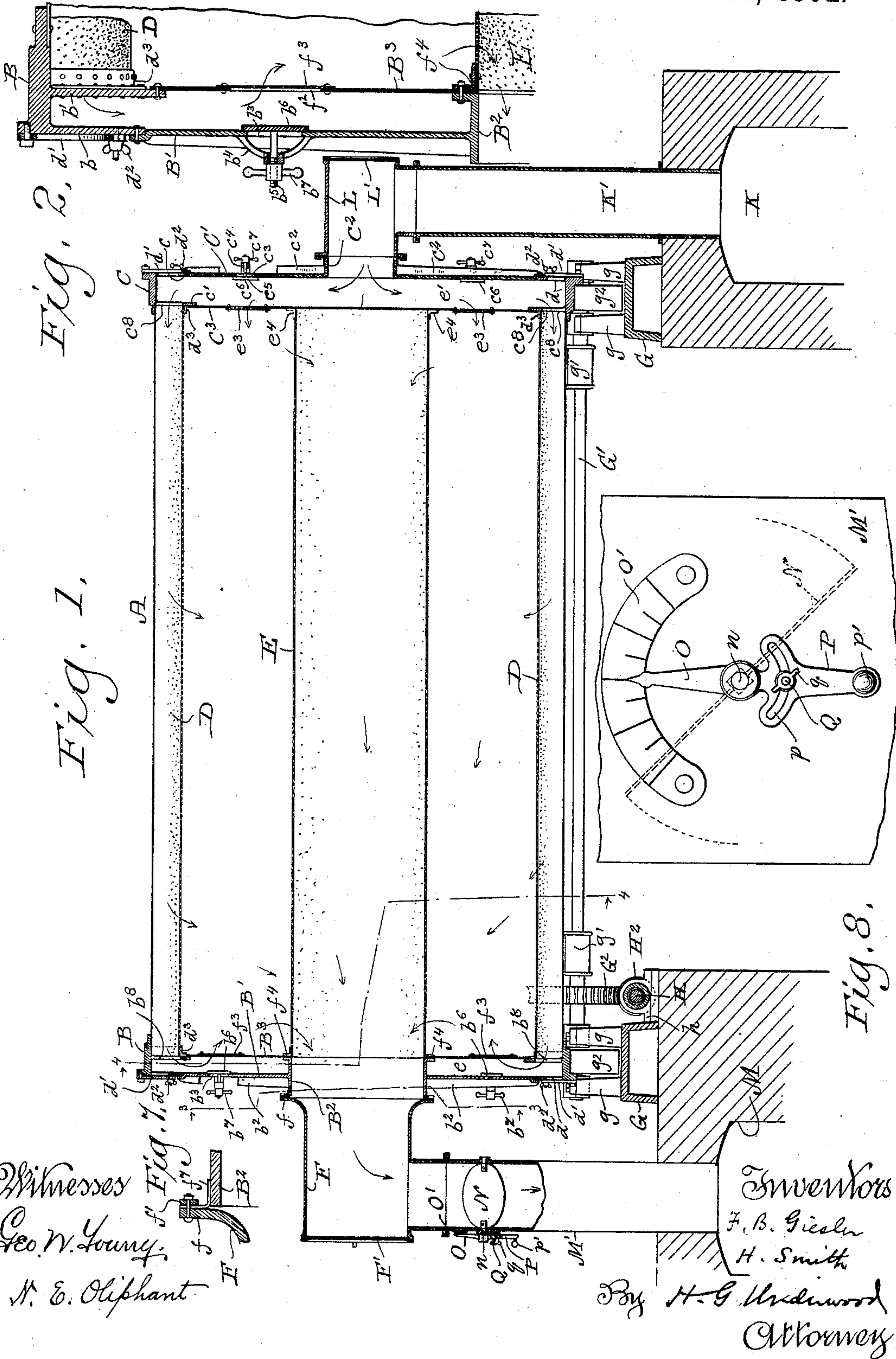
(No Model.)

4 Sheets—Sheet 1.

F. B. GIESLER & H. SMITH.  
PNEUMATIC MALTING DRUM.

No. 476,997.

Patented June 14, 1892.



Witnesses  
Geo. W. Young,  
N. E. Oliphant

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(No Model.)

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Fig. 4.

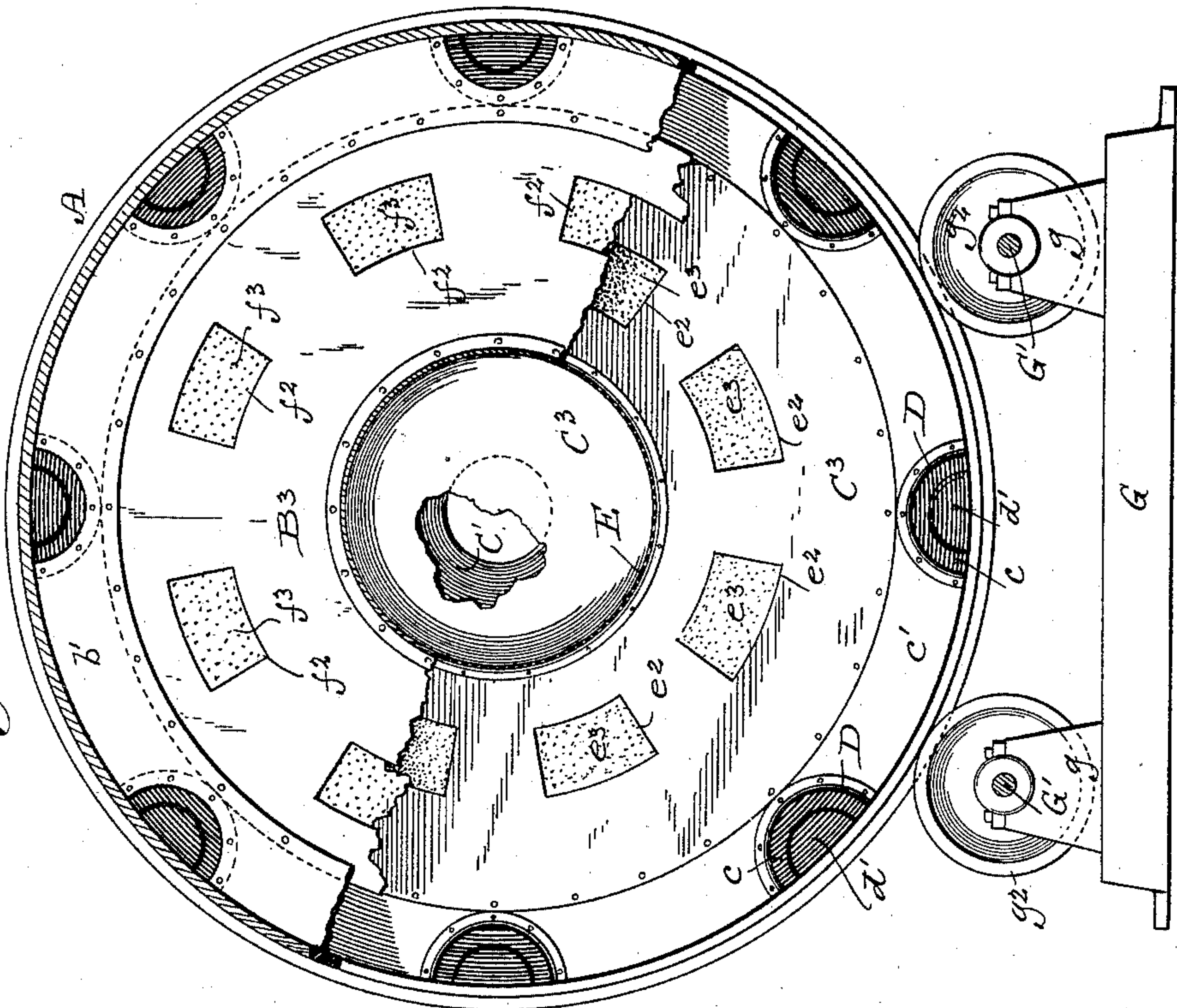
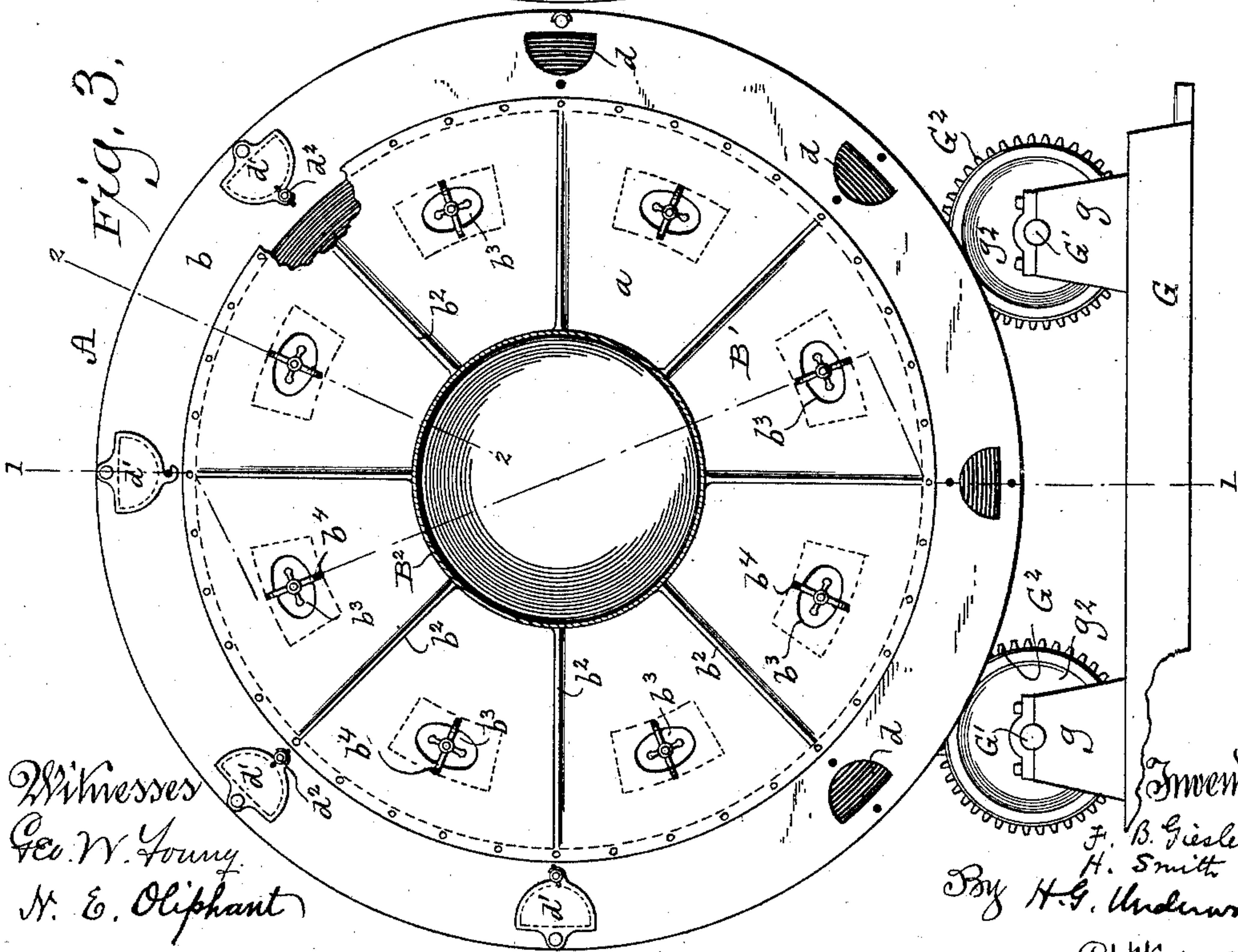


Fig. 3.



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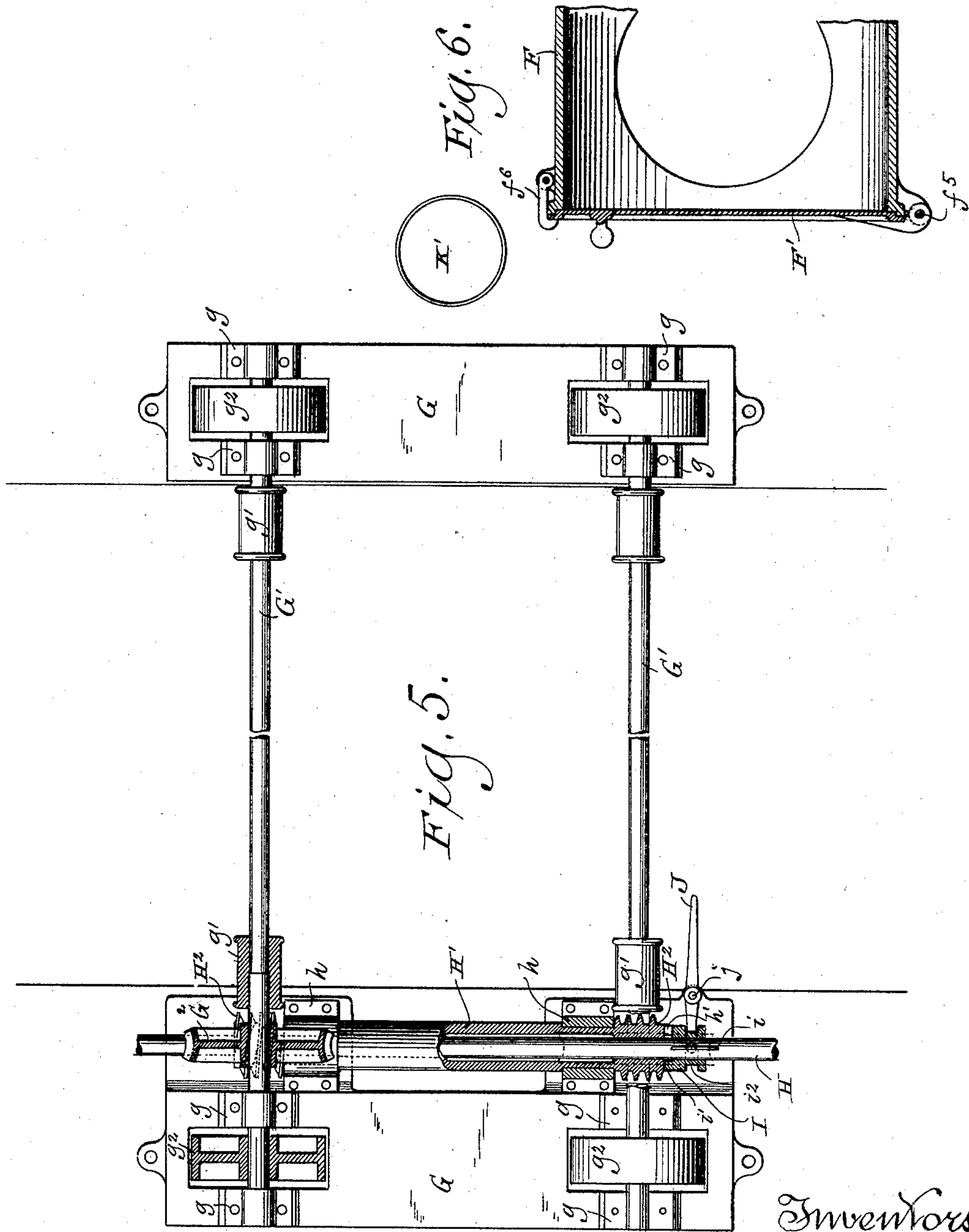
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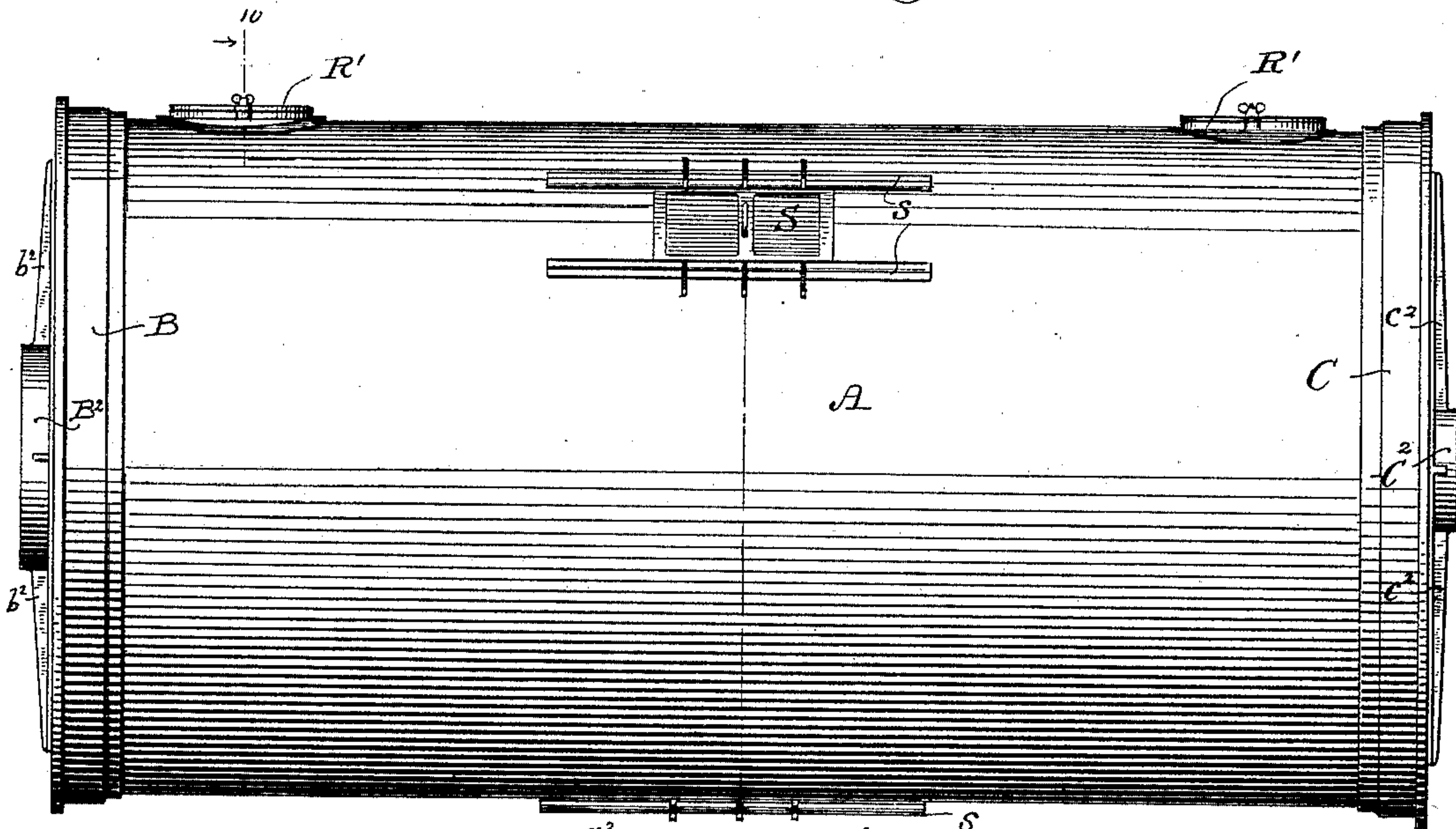
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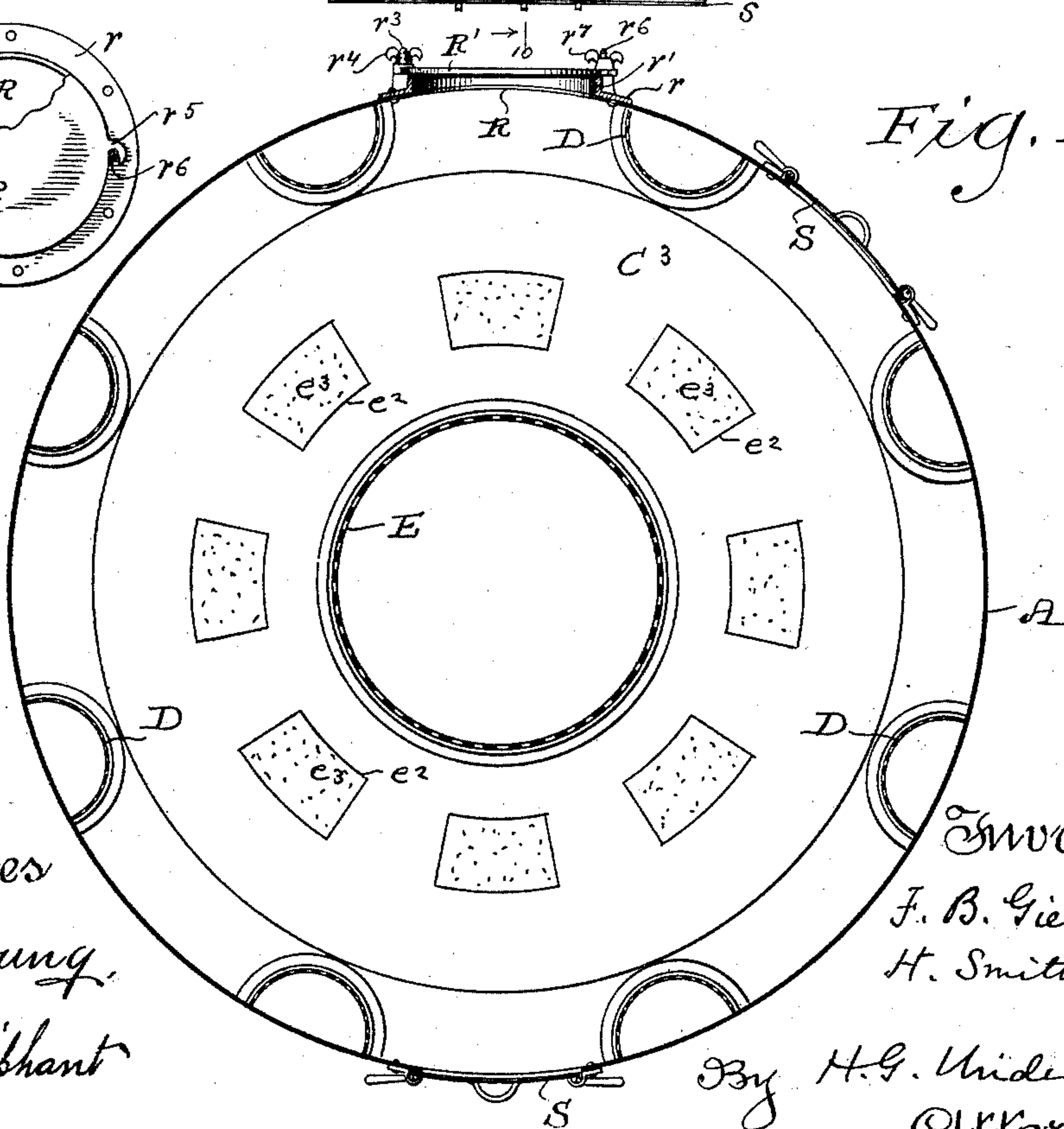
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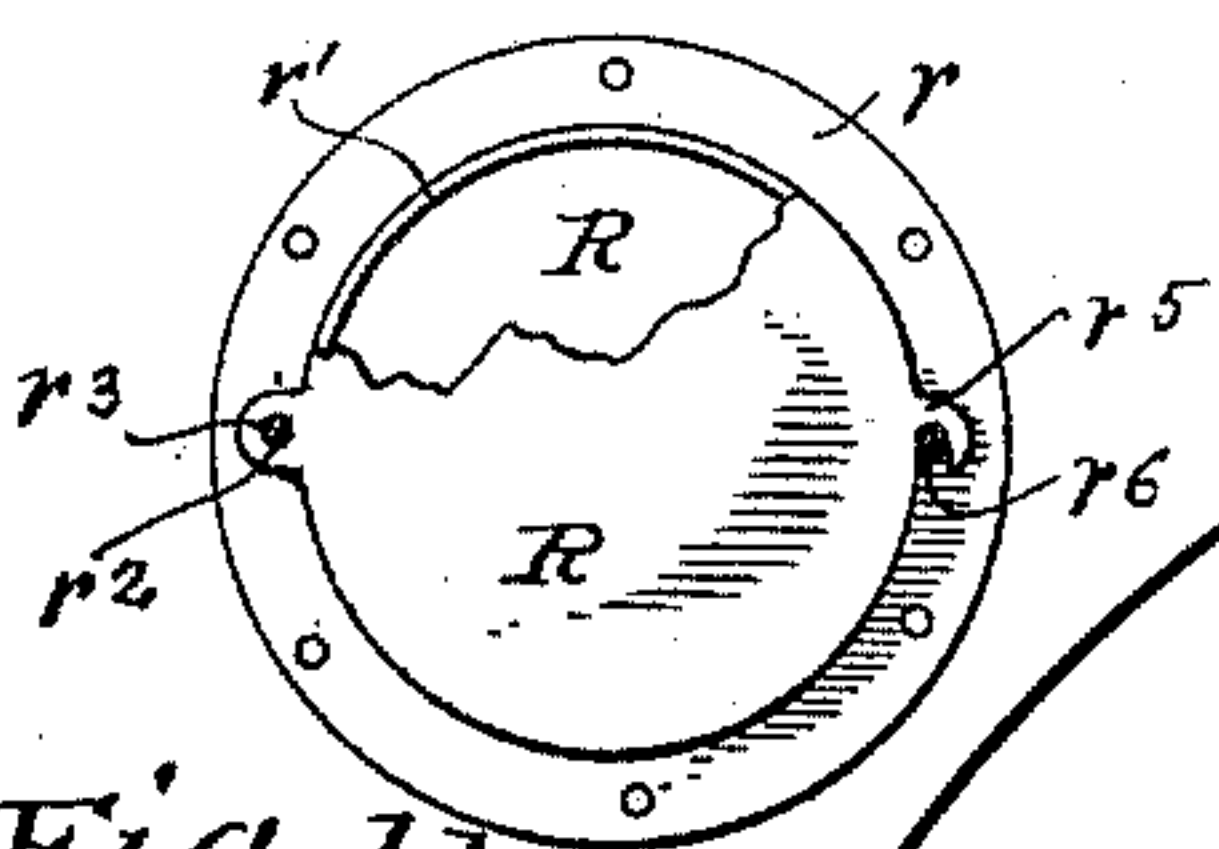
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



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# UNITED STATES PATENT OFFICE.

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MANUFACTURING COMPANY, OF SAME PLACE.

## PNEUMATIC MALTING-DRUM.

SPECIFICATION forming part of Letters Patent No. 476,997, dated June 14, 1892.

Application filed July 15, 1891. Serial No. 399,574. (No model.)

*To all whom it may concern:*

Be it known that we, FRANKLIN B. GIESLER and HENRY SMITH, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Pneumatic Malting-Drums; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to pneumatic malting-drums; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a vertical longitudinal section through one of our improved devices on the line 1 1 of Fig. 3. Fig. 2 is a detail sectional view on the line 2 2 of Fig. 3. Fig. 3 is an end elevation of the said drum, partly in section, on the line 3 3 of Fig. 1. Fig. 4 is a sectional elevation on the line 4 4 of Fig. 1. Fig. 5 is a plan view of the drum supporting and rotating mechanism, partly in section to illustrate details of construction. Figs. 6 and 7 are enlarged sectional views illustrating details of construction, and Fig. 8 is an enlarged detail view of an air-gage used with our device. Fig. 9 is a side elevation of one of our drums. Fig. 10 is a section on line 10 10 of Fig. 9. Fig. 11 is a detail.

A represents a slowly-revolving drum in which grain, after having been steeped, is placed for malting. This drum is formed with outer and inner heads at each end, having spaces between each pair of heads, as best shown in Fig. 1. Said heads are formed of rings B C, with annular flanges  $b$   $b'$  and  $c$   $c'$ , respectively, projecting inwardly therefrom, the annular flange  $b$  having an annular plate  $B'$ , forming with said flange  $b$ , to which it is secured, the outer head at one end, the central opening of said plate being provided with or surrounded by a ring  $B^2$ , integral with said plate  $B'$  and projecting on each side thereof. This plate  $B'$  is provided on its outer surface with radially-disposed strengthening-ribs  $b^2$ , between which are arranged an annular row of hand-holes  $b^3$ , bridged by spiders  $b^4$ , through which pass screw-bolts  $b^5$ , whose inner ends are secured to closing-plates  $b^6$ , secured in

place by hand-nuts  $b^7$  on the outer ends of said bolts  $b^5$ . The annular flange  $b'$  has an annular plate  $B^3$  secured thereto, forming the inner head of the drum A at this end. The other end of the drum is somewhat similarly constructed, there being annular plate  $C'$ , secured to the outer flange  $c$  of the ring C, forming the outer head of the drum A at this end, which plate  $C'$  has an outwardly-projecting ring  $C^2$  (of less diameter than the ring  $B^2$  named) surrounding its central opening; but the plate  $C^3$ , which is secured to the flange  $c'$  of the ring C and which forms the inner head of the drum at this end, has no central opening. The plate C at this end of the drum is provided with radially-disposed strengthening-ribs  $c^2$  on its outer surface, and has an annular row of hand-holes  $c^3$ , with spiders  $c^4$ , screw-bolts  $c^5$ , closing-plates  $c^6$ , and hand-nuts  $c^7$ , corresponding to the similar devices on the other end of the drum, except that the row of hand-holes  $c^3$  are nearer the center of the drum than the hand-holes  $b^3$  referred to.

The interior periphery of the drum is provided with a series of perforated semi-cylinders D D, extending between the inner flanges  $b' c'$  of the rings B C and secured thereto by angular strips  $d^3 d^3$ , which flanges have correspondingly-shaped openings  $b^8 c^8$ , so that the said semi-cylinders D are open at each end into the spaces  $e e'$  between the double heads at each end of the drum A, the outer flanges  $b c$  of the rings B C of said double heads being provided with semicircular openings or hand-holes  $d$ , in register with the semi-cylinders D for ready access thereto, said hand-holes  $d$  being provided with pivoted covers  $d'$ , kept in place by any suitable securing devices, such as screw-bolts on the flanges  $b c$ , engaging with hooks or lips on the covers  $d'$ , and thumb-nuts on said screw-bolts, all as shown at  $d^2$ . The annular plates  $B^3 C^3$ , forming part of the inner heads of the drum A, are each provided with a circular row of openings  $f^2 e^2$ , respectively, the said openings being covered with perforated plates  $f^3 e^3$ , respectively, the covered openings  $e^2 e^3$  in plate  $C^3$  being in line with the hand-holes  $c^3$  in the outer head at that end of the drum and nearer the center thereof than the cov-



ered openings  $f^2 f^3$  in plate  $B^3$ , which are in line with the hand-holes  $b^3$  in the outer head at the other end of the drum.

E is a central perforated cylinder extending from the plate  $C^3$  of the inner head at one end of the drum, longitudinally through the latter to the annular plate  $B^3$  at the other end thereof in line with the described ring  $B^2$  at said end, being secured to said heads by suitable angle-strips  $e^4 f^4$  and bolts, as shown, said bolts at one end also passing through a flange on the ring  $B^2$ , as shown in Fig. 2.

F is a chamber communicating with the passage through ring  $B^2$  from cylinder E, and the inner flanged end  $f$  of this chamber F is provided with a stout rubber packing-ring  $f^7$ , bent so that one edge bears against the ring  $B^2$ , while the other edge bears against the flanged end  $f$ , to which it is secured by a ring  $f'$  and bolts, all as shown in Fig. 7. The outer end of this chamber F is closed by a door  $F'$ , hinged to said chamber, as shown at  $f^5$ , and secured when closed by catch  $f^6$ , all as best shown in Fig. 6.

G G represent suitable beds or bases, from which rise bearings  $g g$  for cross-shafts  $G' G'$ , (which shafts may be made in sections with couplings  $g'$ , if desirable,) said shafts having fast on them worm-wheels  $G^2$  and pulleys  $g^2$ , which latter support the drums A and revolve the same by frictional contact therewith, when the said shafts  $G'$  are themselves revolved through their said worm-wheels, as hereinafter explained.

H is a shaft extending transversely beneath one end of each drum A, the preferred arrangement being that several of these drums are arranged in transverse line with each other and with the said shaft H extending in a line beneath one end of all of them. Beneath each drum the shaft H carries a sleeve  $H'$ , loose thereon, in bearings  $h h$ , said sleeve  $H'$  terminating at each end in a worm  $H^2$ , one end of this worm-sleeve  $H'$  being formed with clutch-notches  $h'$ .

I is a clutch-collar movably secured to the shaft H by a groove and feather  $i$ , and having clutch-pins  $i'$  at one end for engagement at the proper time with the notches  $h'$  in the end of the sleeve  $H'$ , and having, also, a circumferential groove  $i^2$  for engagement with the shifting-lever J, pivoted, as shown at  $j$ , to the base G.

K represents a tunnel, duct, or passage leading from the source or reservoir of the moist purified air which is to be drawn through the drums A and the grain or malt in them contained, and  $K'$  is a pipe or passage leading from the passage K to a chamber L, which communicates with the passage or opening formed by the ring  $C^2$  at the adjacent end of the drum A, the connection between the chamber L and ring  $C^2$  being identical in construction with that already described between the chamber F and ring  $B^2$ , and illustrated best

in Fig. 7, and the outer end of the chamber L is closed by a door  $L'$ , identical in construction and arrangement with the door  $F'$  of chamber F, already described, and illustrated best in Fig. 6.

$M'$  is a pipe or passage leading from the bottom of the chamber F of each drum to a tunnel, duct, or passage M, which latter communicates with a suction-fan, (not shown,) so that the air may be thereby drawn through the drums and their contents, as already stated.

N is a damper in the pipe or passage  $M'$ , one journal  $n$  of which damper projects through the wall of the pipe  $M'$  and carries on the outside a pointer or index-finger O, there being a scale  $O'$  on the outside of said pipe  $M'$ . The shank P of this pointer O is provided with an arc-shaped slot  $p$ , through which projects a screw-bolt Q, with a thumb-nut  $q$  thereon to set the damper N to any desired position to which it has been turned by the handle  $p'$  of the said pointer O, whereby the flow of air through the said pipe or passage  $M'$  may be regulated.

In our improved drum the moist purified air from the duct or passage K is drawn through pipe  $K'$  and chamber L into the space  $e'$  at the adjacent end of the drum A through the opening of the ring  $C^2$ , said air first striking against the imperforated central part of the plate  $C^3$ , forming a part of the inner head at this end of the drum, and being thence deflected to the open ends of the semi-cylinders D D, surrounding the inner periphery of the drum and passing therethrough to the space  $e$  at the other end of the drum, a portion of said air entering the end of the drum through the perforated plates  $e^3$  and more of it passing into the interior through the perforations in the said semi-cylinders D, and that portion reaching the space  $e$  being sucked into the interior through the perforated plates  $f^3$  in the adjacent inner drum-head, and from all these points being drawn through the grain or malt in the slowly-revolving drum into the central perforated cylinder E, and out through the passage within the ring  $B^2$  into chamber F, pipe  $M'$ , and duct or passage M to the aforesaid suction-fan. (Not shown.)

In the operation of our drums it happens from time to time that the perforated plates  $e^3 f^3$  become clogged, and to remedy this the openings  $c^3 b^3$  are provided, which permit the entrance of the operator's arm or hand to clean the same and which when not in use are closed, as described, and similarly when access to the semi-cylinders D D is desired. This is obtained through the hand-holes  $d$  in the flanges  $b c$  of the rings B C of the drum-heads, which hand-holes when not in use are closed by the doors  $d'$ , as described, and the doors  $F' L'$  afford ready and convenient means of access to the chambers F L. Hence the interior of our improved drums is always easily accessible to the operator. When for



any reason it is desired to stop the rotation of any particular drum A without stopping the shaft H, this can be instantly done by the described shifting-lever J, and by a movement of said lever and the clutch-collar I in the opposite direction the revolution of said drum can be as quickly again started.

In Figs. 9, 10, and 11 are shown the feed-openings and their closing devices used with our improved drums. We prefer to have two of these openings R R, one adjacent to each end of the drum, said openings being each surrounded by a collar  $r$ , shaped to fit the periphery of the drum to which it is riveted, from which collar there rises an annular flange  $r'$ , the latter rising to a uniform height.

$R'$  is a door resting on the flange  $r'$  and having a lug  $r^2$  at one side fitting over a screw-bolt  $r^3$ , which forms the pivot of the door, a thumb-nut  $r^4$  securing the door in place, and said door having a catch  $r^5$  at its opposite side for engagement with another screw-bolt  $r^6$ , a thumb-nut  $r^7$  on said screw-bolt serving to securely fasten the said door when it is closed, so that it will not become loosened by the rotation of the drum.

S S represent the preferred form of doors for closing the dumping-openings in our vats, said doors operating in slides  $s s$  and having suitable fastening devices; but the peculiar construction thereof forms no part of our present invention.

In practice we have found it most convenient to arrange the feed-openings R one adjacent to each end of the drum, as stated, and have found that by reason of the described collar rising to a uniform height grain can be better fed into these openings than if they were simply flush with the circumference of the drum, and as they do not require frequent opening we prefer to close them by the pivoted doors described, which form a very secure lock when the thumb-nut  $r^4$  is screwed to place on each door; but for the ready dumping of the contents of the drum we prefer sliding doors at the dumping-openings, which we place in a line intermediate of the feed-openings, and preferably in the central circumferential line of the drum, so that said dumping-openings will be entirely removed from proximity to the revolving and supporting mechanism adjacent to the drum ends, and hence more accessible from beneath, while the feed-openings, being adjacent to the ends of said drum, are more accessible from above in these locations.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. In a malting-drum, the combination, with the outer and inner heads at each end separated by spaces and having central openings in the outer heads, one of said inner heads having an imperforate center and the other having a central opening, of peripherally-arranged open-ended perforated semi-cylinders between said inner heads, a perforated central cylinder extending from the imperforate center of one of said inner heads to the central opening in the other of said inner heads, annular rows of openings in each of said inner heads, perforated plates covering said openings, annular rows of openings in the outer heads, registering with the said annular rows of openings in the inner heads and with the said semi-cylinders, and closing devices for said openings in the outer heads, substantially as set forth.

2. The combination, with a rotating malting-drum, of shafts formed in sections and connected together, arranged longitudinally beneath said drum and carrying pulleys on which said drum rests and by which it is rotated, and worm-wheels fast on said shafts, another shaft arranged transversely beneath said drum and beneath said longitudinally-arranged shafts, a sleeve loose on said transverse shaft and terminating in worms at each end and having clutch-notches at one end, a longitudinally-movable clutch-collar secured to said transverse shaft and having clutch-pins at one end, and a shifting-lever in engagement with said clutch-collar, substantially as set forth.

3. In a malting-drum, a cylinder having feed-openings in its periphery, one near each end thereof and each surrounded by a collar shaped to fit and secured to the said periphery, said collar having an annular flange rising to a uniform height and provided with a flat pivoted door, and dumping-openings arranged in a line intermediate of the lines of the feed-openings and provided with sliding doors, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANKLIN B. GIESLER.  
HENRY SMITH.

Witnesses:

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N. E. OLIPHANT.