

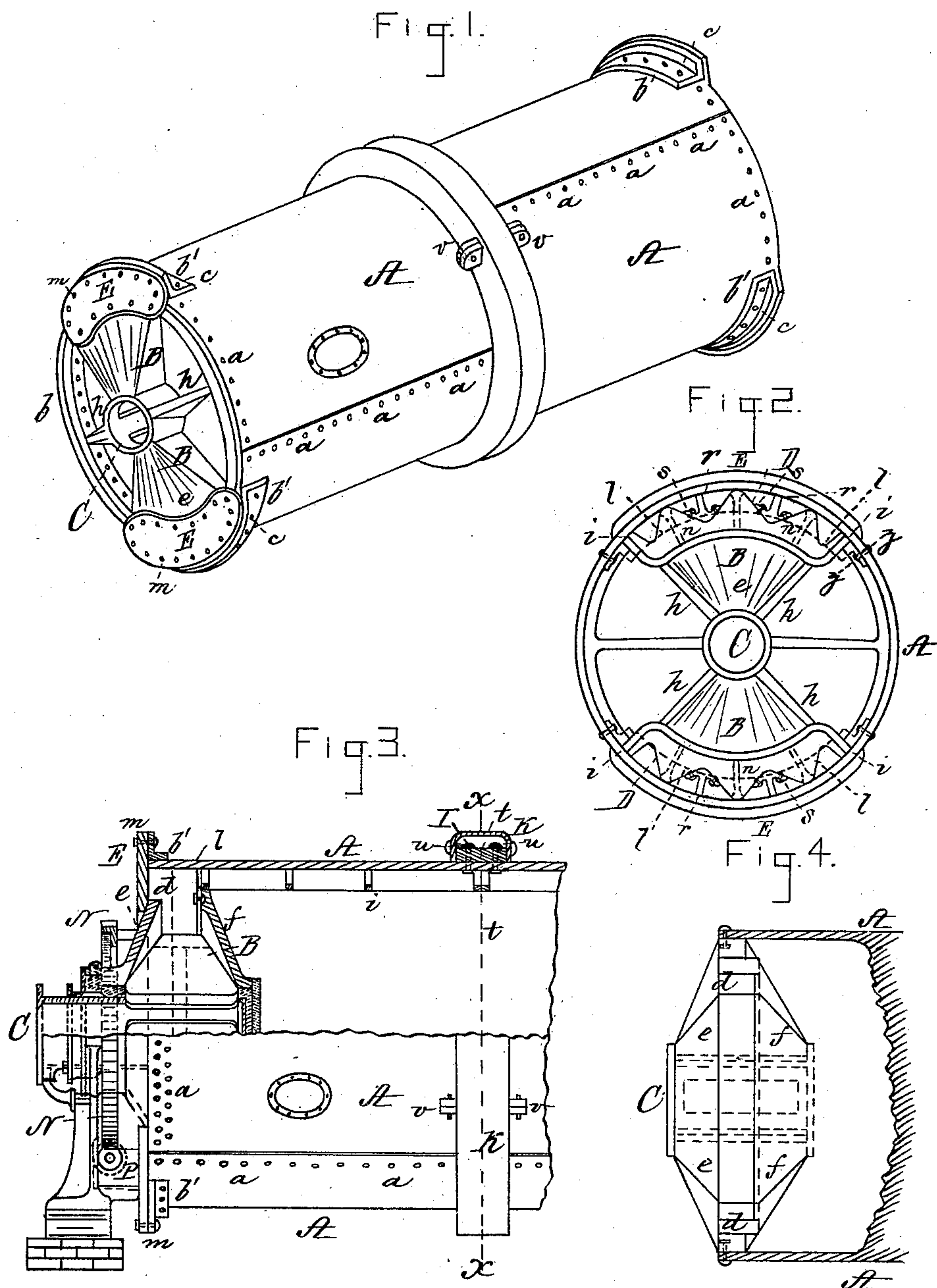
(No Model.)

2 Sheets—Sheet 1.

J. A. CROCKER.  
FILTERING MACHINE.

No. 358,106.

Patented Feb. 22, 1887.



WITNESSES.

W. P. Clough.  
H. W. Stearns.

INVENTOR.

James A. Crocker,  
per Norman W. Stearns,  
Atty.

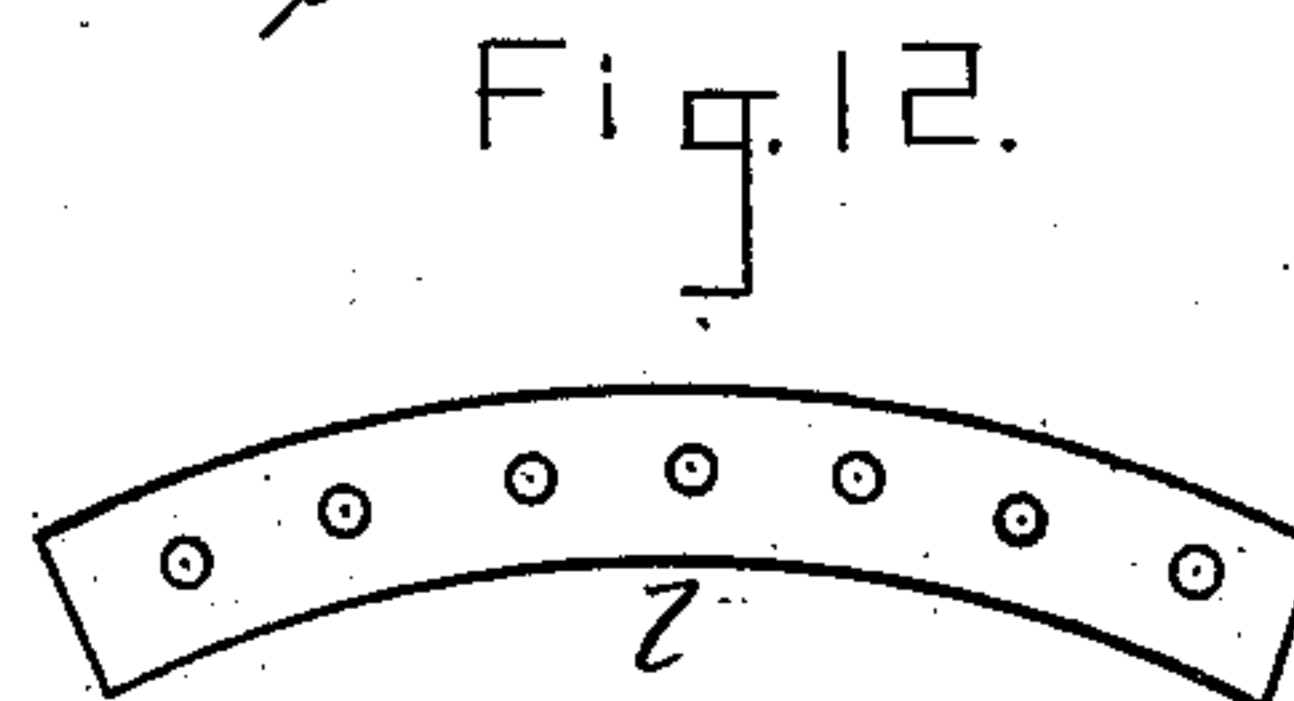
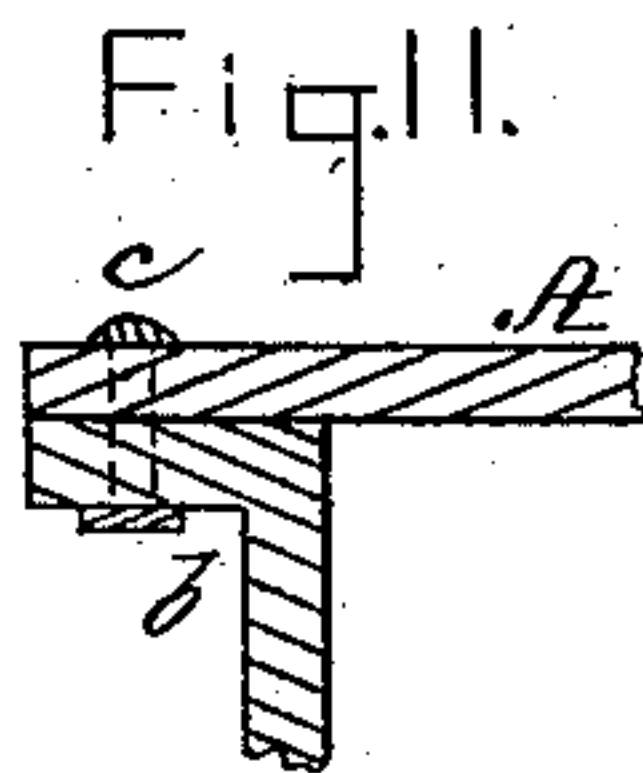
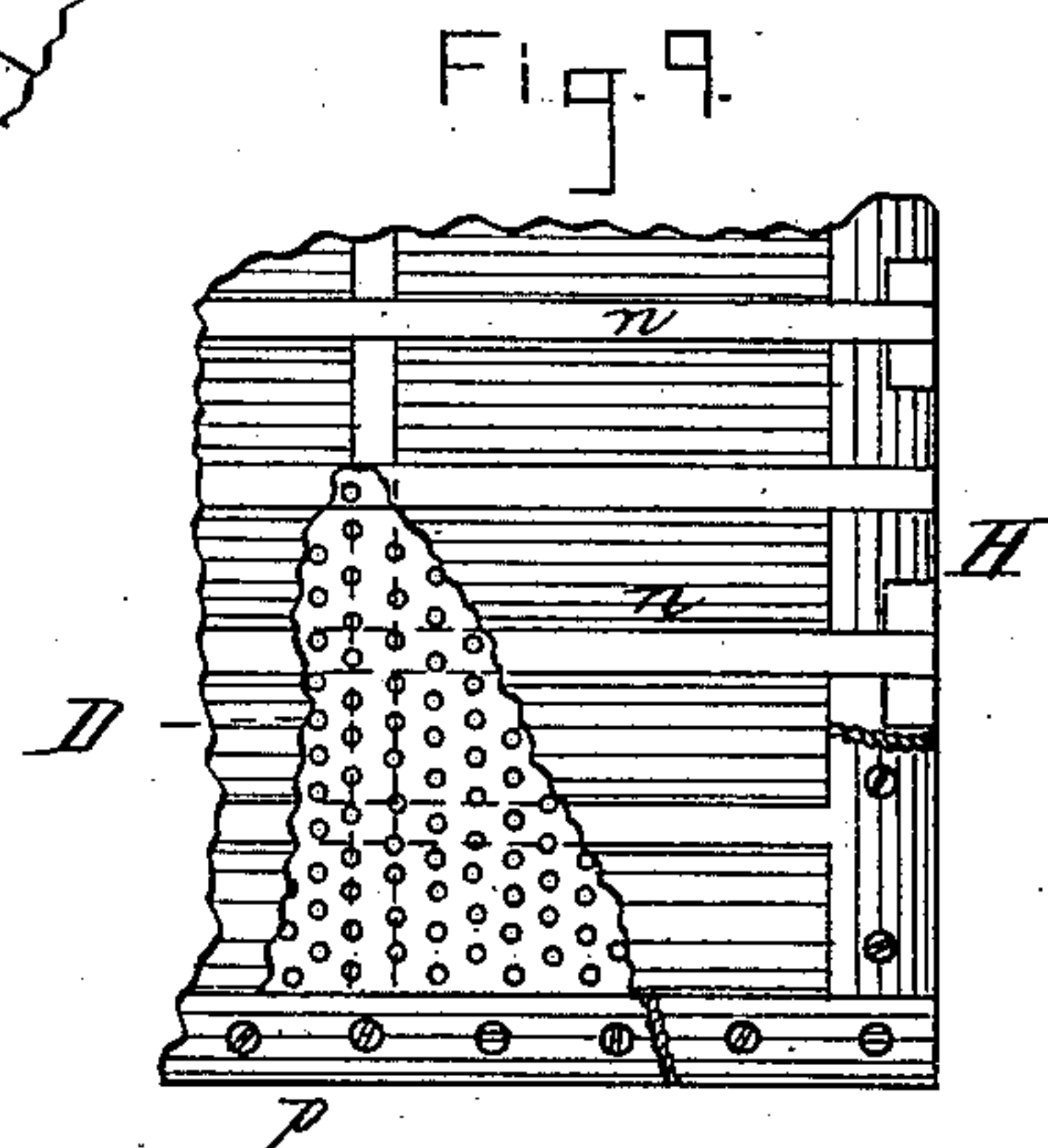
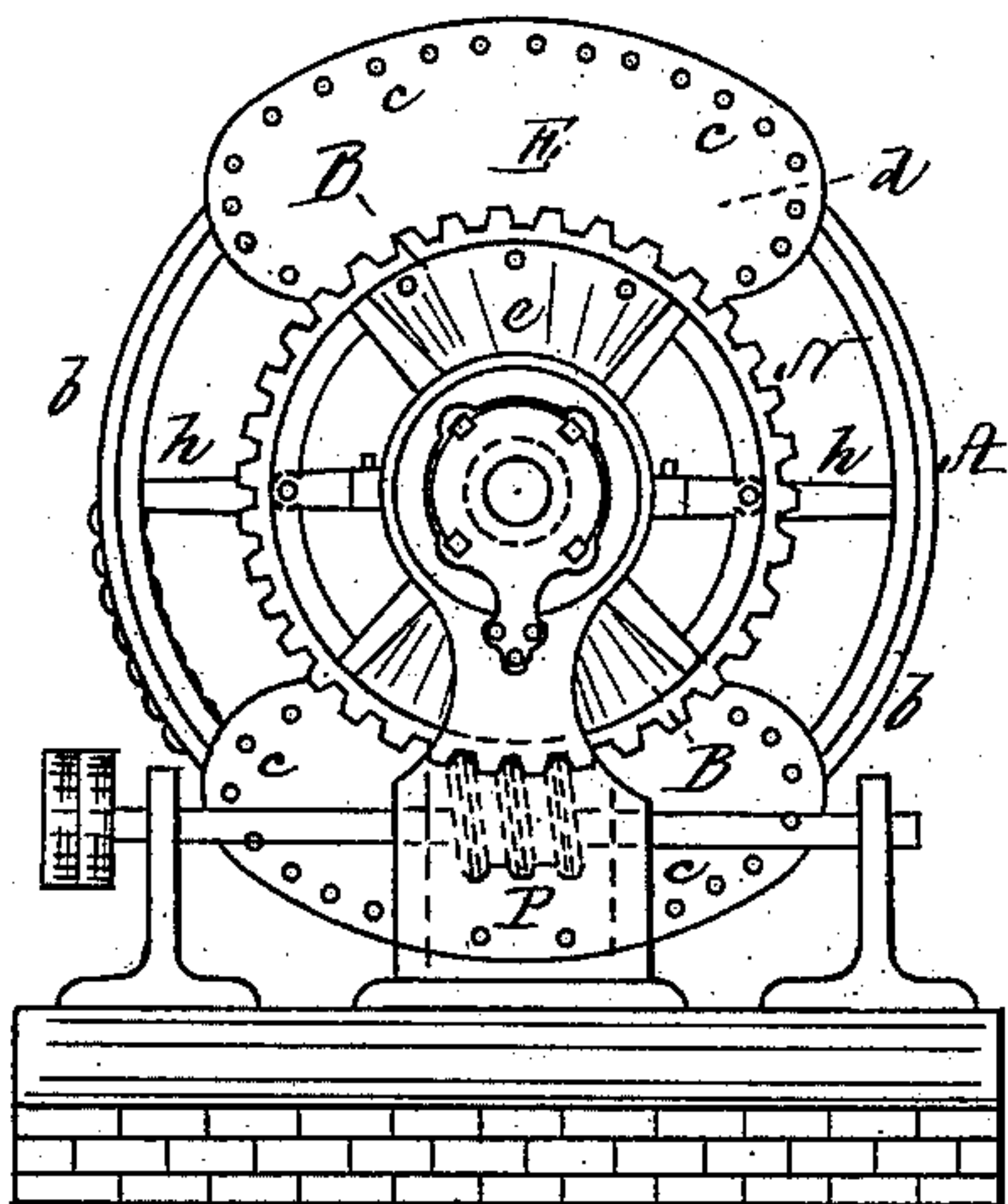
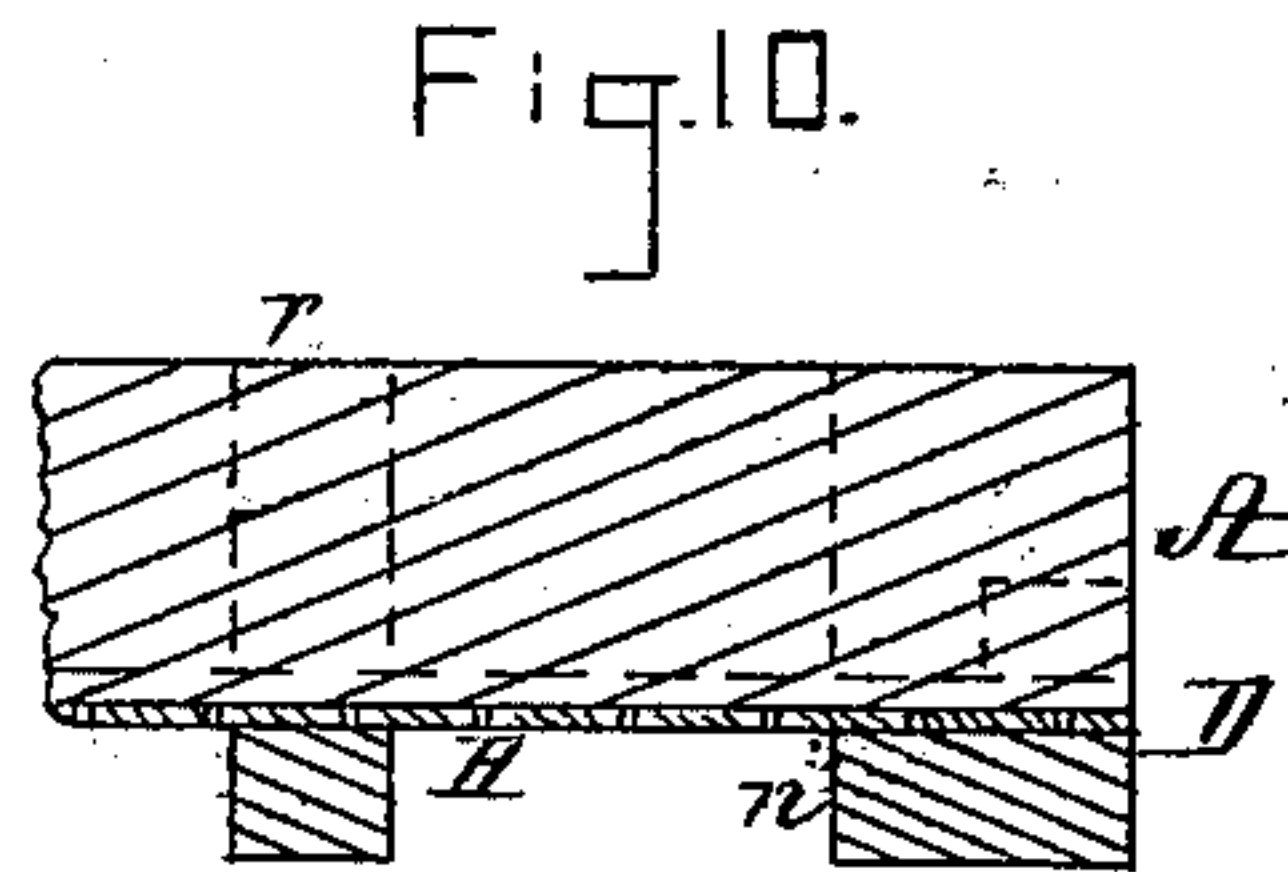
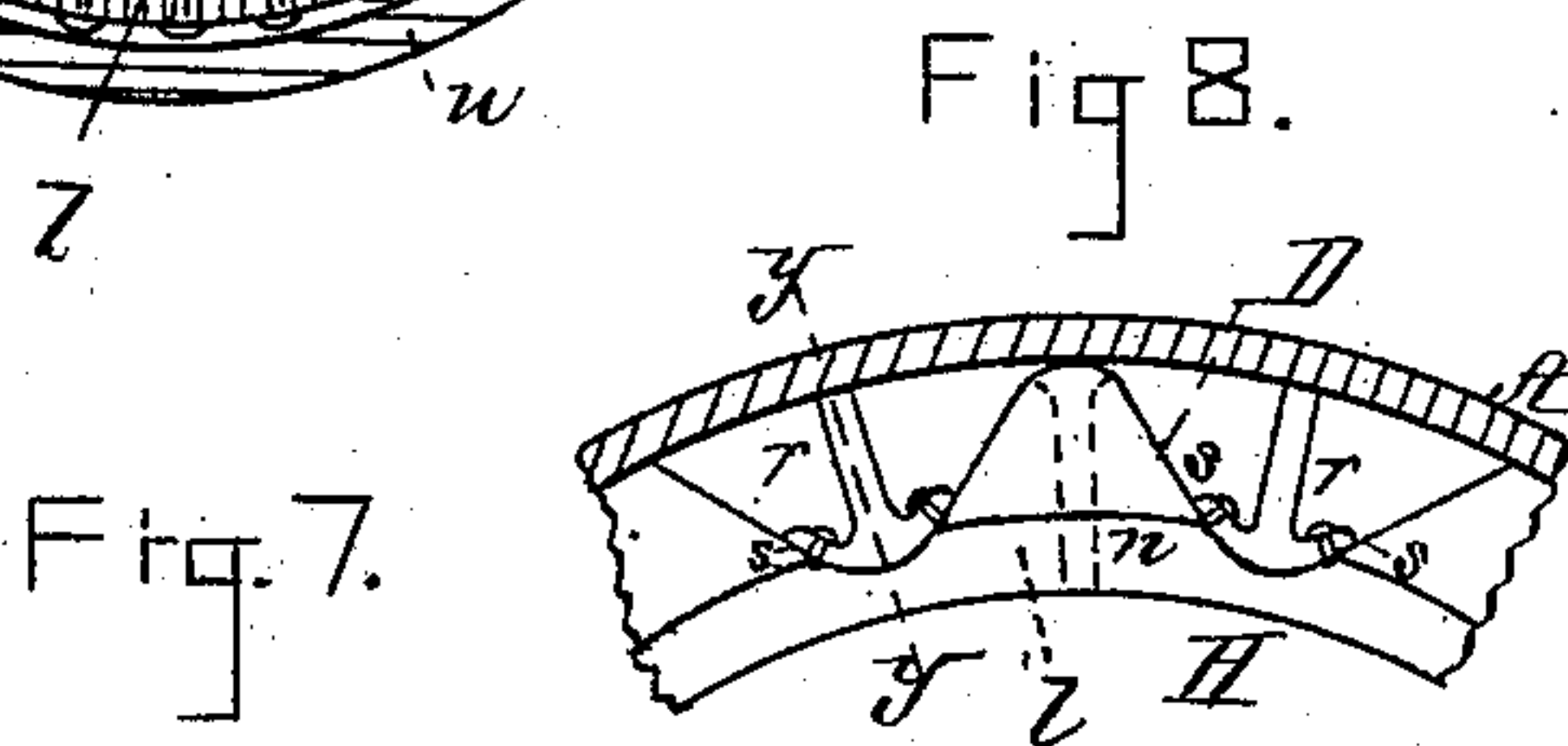
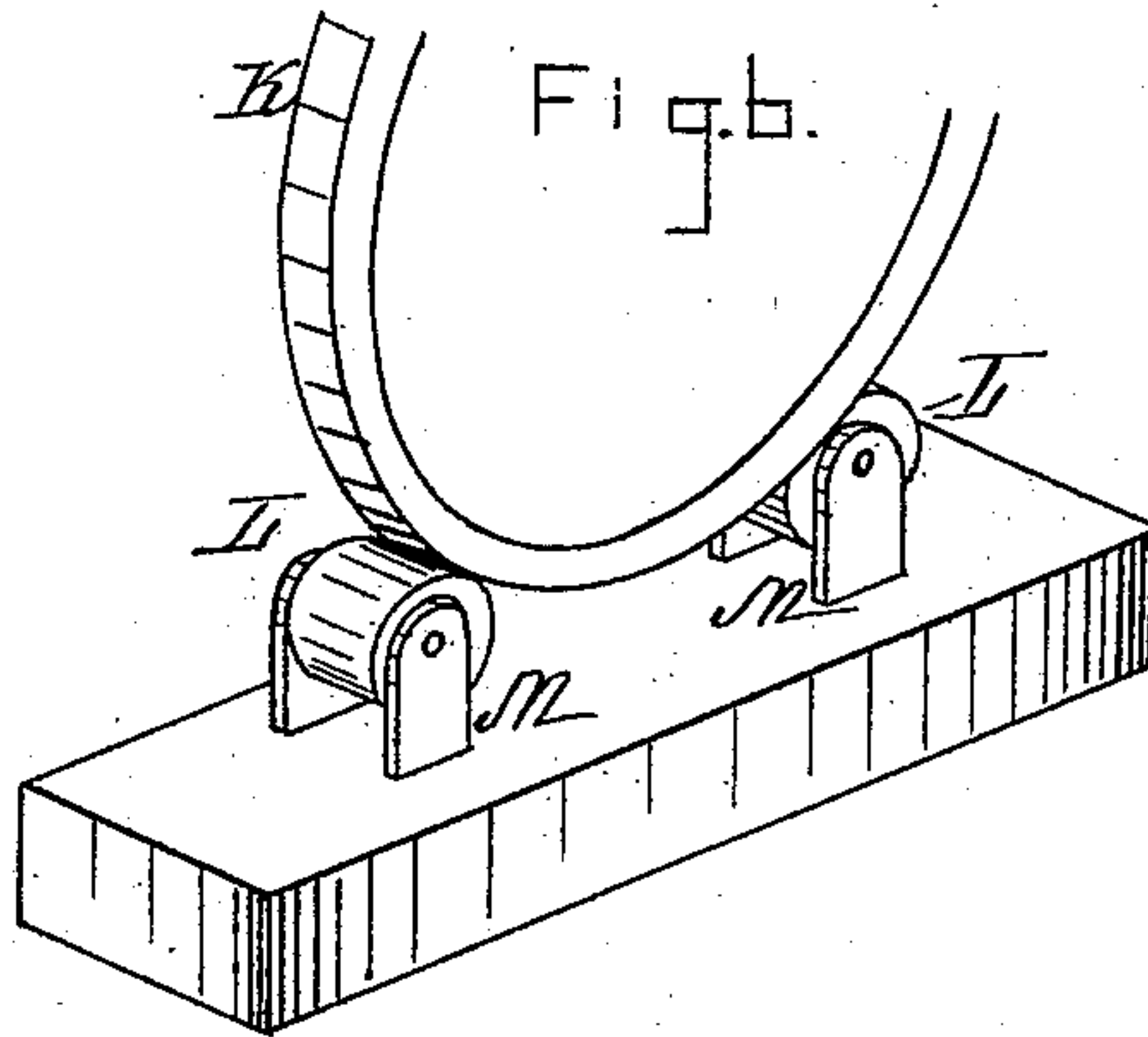
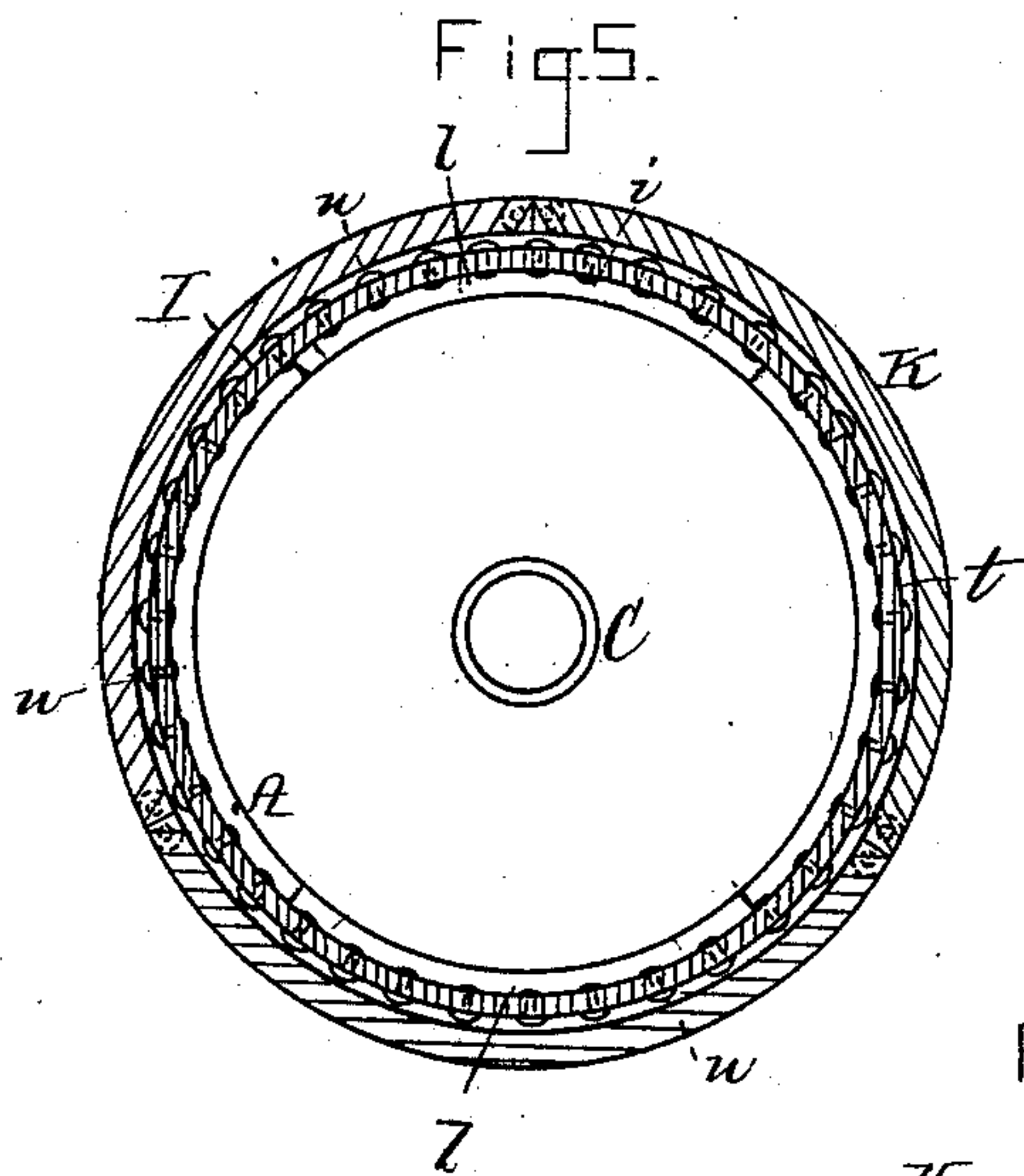
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

JAMES ALLEN CROCKER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE  
CROCKER FILTERING COMPANY.

## FILTERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,106, dated February 22, 1887.

Application filed April 16, 1886. Serial No. 199,053. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES ALLEN CROCKER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Filtering-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the shell or casing of my improved filtering-machine. Fig. 2 is an end elevation representing the location of the strainers within the openings of one of the heads of the casing. Fig. 3 is a sectional elevation, the upper portion of said figure representing a longitudinal central section, and its lower portion a longitudinal or side elevation of my filtering-machine mounted on its supporting-frame. Fig. 4 is a plan representing a portion of the casing broken away. Fig. 5 is a transverse section through the center of the filtering-machine in the direction of the line  $xx$  of Fig. 3, being at the joint formed by the junction of two equal cylindrical sections. Fig. 6 is a perspective view of a roller, bearing for the center of the filtering-machine. Fig. 7 represents the end of the casing mounted in its bearing and provided with a cog-wheel, with which engages a worm-gear for revolving the same. Fig. 8 represents a portion of my improved corrugated strainer and its frame and supporting-braces enlarged. Fig. 9 is a plan of the same. Fig. 10, a section on the line  $yy$ , enlarged. Fig. 11, enlarged section on the line  $zz$  of Fig. 2, showing the manner of securing the head in the end of the casing. Fig. 12 is an elevation of the curved clamping-plate secured at each end of the strainer to prevent any longitudinal movement thereof when adjusted in place.

My present invention has for its object to afford additional facilities for the construction and manipulation of filtering-machines of large size for manufacturing purposes, and for the supply of cities, &c., special reference being had herein to that class of filter described in Patent No. 305,574, granted me September 23, 1884, in which a single shell or casing containing the filtering material is employed without any other outer or inclosing casing;

and one of the features of this invention consists in a single shell or casing closed at all points of its exterior surface except at its ends, which are provided with openings located diametrically opposite each other for the reception of the strainers, in order to enable them to be more readily entered and removed, the casing being preferably of cylindrical form of boiler-iron, thus insuring maximum lightness with the necessary strength.

My invention also consists in certain longitudinal rails secured to the inside of the casing on each side of the strainer-frame to form dovetail ways, upon which it may readily be slid into place within or removed from the casing,

My invention also consists in a pair of curved plates to be clamped to the inner walls of the heads at opposite ends of each opening in the casing, said plates preventing the longitudinal movement of the strainer after being located therein.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents a cylindrical shell or casing, formed preferably of plates of sheet-iron riveted together at  $a$ , the entire cylindrical surface being closed, but provided with a closed man-hole for the entrance and removal of the filtering material. Each end of the cylindrical casing is provided with a hollow head, B, the outer wall of which has a horizontal flange,  $b$ , extending around about two quarters of its periphery, and it is by this horizontal flange that the head is secured to the corresponding or contiguous end portion of the casing by a series of rivets,  $c$ , Figs. 1, 7, and 11.

The form of the hollow head is shown in Figs. 3 and 4, and each head has two curved openings,  $d$ , extending through its inner and outer walls,  $e, f$ , and located immediately above and below and diametrically opposite each other, and between the inner end of each opening  $d$  and the contiguous outer periphery of the hub C the exterior wall of the head B tapers outwardly from the lower portion of the upper opening  $d$  downward and outward from a vertical line, and from the upper portion of



the lower opening  $d$  upward and outward from a vertical, the two longitudinal sides of each opening being formed by two concentric arcs of circles having the axis of the filter-casing as their center. The remaining portion of the exterior wall of the head lies in a vertical plane extending between the inner end of the horizontal flange  $b$  and the hub C.

Each inner portion of the head B is correspondingly tapered inwardly from its outside toward its hub, Fig. 4, the space between the two walls or portions of the head at each end of the shell forming a water-passage of greatest width in the direction of a vertical plane passing through the axis of the machine, said water-passage being of greatest length at its outer end—i. e., in the direction of a plane at right angles to the axis—whereby a passage of uniform size at any point in cross-section is formed, which insures the unobstructed flow of the water, as desired. The exterior wall of each tapering head is re-enforced by webs  $h$ , which serve as braces, the inner ends of which terminate at the hub.

The two openings  $d$  in each head are for the reception of the two curved corrugated strainers D D, Figs. 2, 8, and 9, these end openings enabling them to be conveniently and expeditiously located in position or removed from the casing, longitudinal rails  $i$ , bolted to the inside of the casing, Figs. 2 and 5, being provided and serving as dovetail ways for the strainers to slide on. These rails or ways prevent any lateral movement of the strainers after being adjusted in place, and their longitudinal movement is prevented by two circular clamping-plates,  $l$ , bolted to the inner walls of two opposite heads, Fig. 12.

Each opening  $d$  is closed by a covering-plate, E, secured thereover in such manner as to insure a water-tight joint, the outer edge of each head being secured by bolts  $m$  passing into the flange of a segmental strip,  $b'$ , riveted to the cylindrical exterior of the shell near its rim, by which construction the bolts may be loosened and the covers removed with greater facility than were the casing provided with openings in its cylindrical surface, as set forth in the Letters Patent No. 305,574 to me, (herein referred to,) the cost of construction of the filtering-machine forming the subject of my present invention being thereby reduced.

For this class of filtering-machine I preferably employ a perforated plate, D, of metal, Fig. 9, bent so as to form corrugations, thereby securing a large area of straining surface.

H is a curved frame having a series of rectangular braces,  $n$ , extending longitudinally and cast integral therewith. The corrugated strainer is placed upon these braces and its frame, and then confined to the latter by a band or strap,  $p$ , extending around its edges, Fig. 9, after which a second series of braces,  $r$ , each provided with ears  $s$ , is bolted to the strainer-frame, the two series of braces being

located on opposite sides of the strainers, and occupying alternate positions with each other and the corrugations. When the strainer is within the casing, the outer ends of the second series of braces abut against the inner periphery of the casing, the joint office of the two series of braces  $n$   $r$  being to preserve the original form of, keep in place, and prevent damage to, the strainer.

Where the length of the cylindrical casing is considerable and the weight consequently great, I intend to divide it into two equal portions snugly abutting each other at the center, the joint  $t$  at this point being made secure and water-tight by a metal ring, I, located thereover and fastened by two rows of bolts,  $u$ , one on each side, passing through its two flanges and the cylindrical boiler-plate casing. (See Figs. 1, 3, and 5.)

As in this construction the weight of the filtering-machine with its contents of water and filtering material would jeopardize the strength of the joint  $t$  if its encircling-ring I was unsupported, I secure thereover an annular covering-band, K, formed in three sections, having flanges  $v$  united by bolts, and provide bearings therefor composed of rolls L, mounted in a frame, M, fastened to the floor thereunder. (See Fig. 6.) Where the casing is formed of two cylinders in this way, each curved corrugated strainer may be divided into two equal portions, one of which is entered through one opening  $d$  of one head B, and the other portion through the corresponding opening  $d$  of the head at the opposite end of the divided casing.

Where the length of the strainer is not great, it may be in one piece and be inserted and removed at one operation. One or both heads are provided with cog-wheels N, with which engages worm-gear P, Figs. 3 and 7, for rotating the filtering-machine when required to be reversed, or pinions may be employed, if desired.

In an application for patent made by me simultaneous herewith I have described many parts of the mechanism herein described, as such description was necessary to show the construction and in what manner the invention was carried out; but in said simultaneous application I do not claim the features herein claimed.

I claim—

1. A filtering-machine having but a single shell or casing, A, with its entire exterior surface closed at all points except at its ends or heads, each of which is provided with a pair of openings,  $d$ , in combination with a pair of strainers and a pair of covering-plates, E, substantially as described.

2. A single shell or casing of cylindrical form having a head provided with a pair of openings closed by a pair of covering-plates, the inner edges of which are bolted to the head and their outer edges to strips riveted to the

cylindrical rim of the casing, in combination with strainers entered at and removed from said openings, as set forth.

3. In combination with the strainer-frame  
5 and inner walls of the heads, a clamping-plate,  
7, secured to the latter to prevent the longitudinal movement of the strainer-frame, and a pair of longitudinal rails, 8, for preventing its

lateral movement, constructed to operate substantially as described.

Witness my hand this 31st day of March,  
1886.

JAMES ALLEN CROCKER.

In presence of—

N. W. STEARNS,

H. W. STEARNS.

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