

No. 860,169.

PATENTED JULY 16, 1907.

J. E. WARREN.
BEATING ENGINE.

APPLICATION FILED MAY 31, 1907.

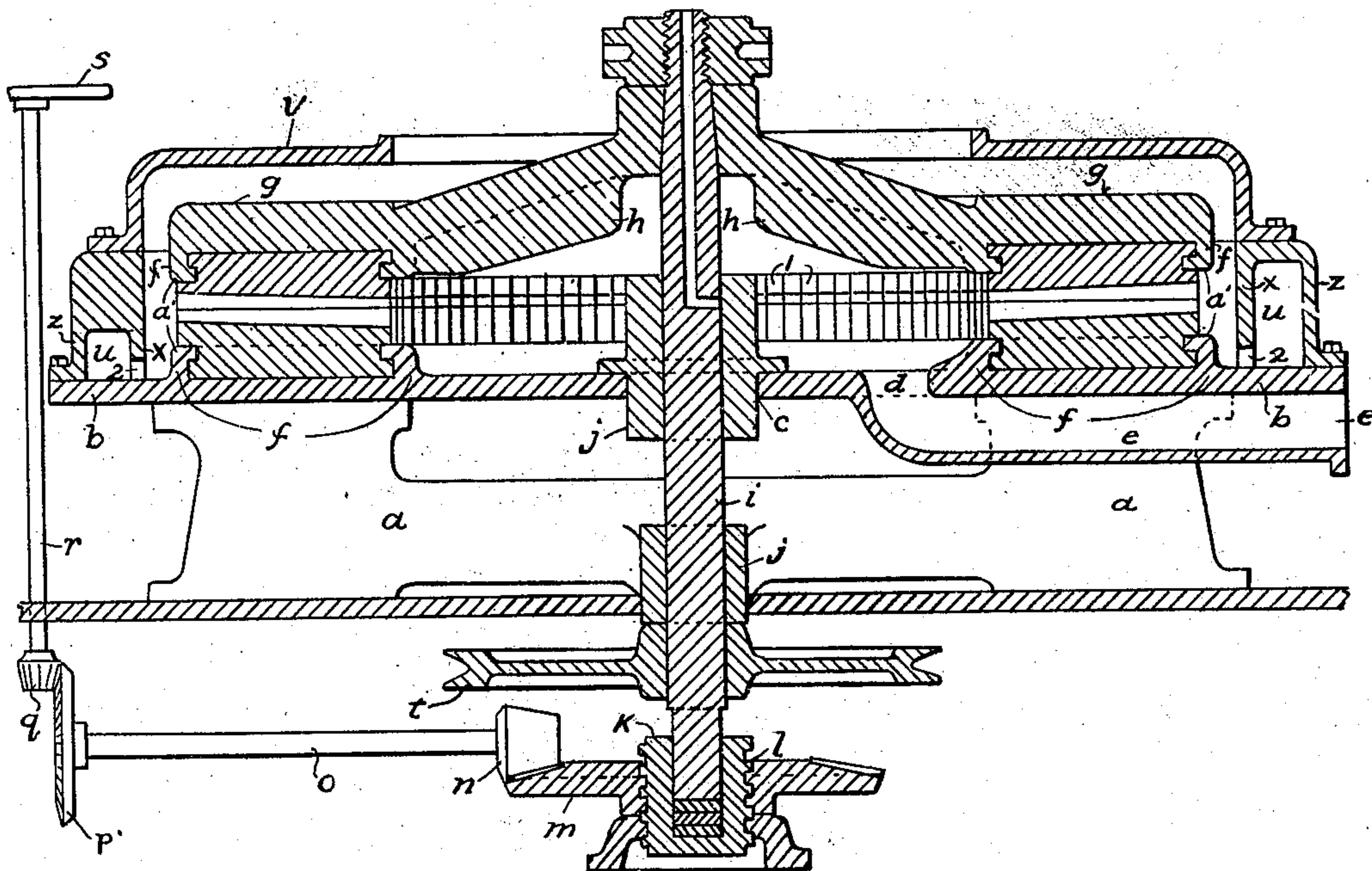


Fig. 1.

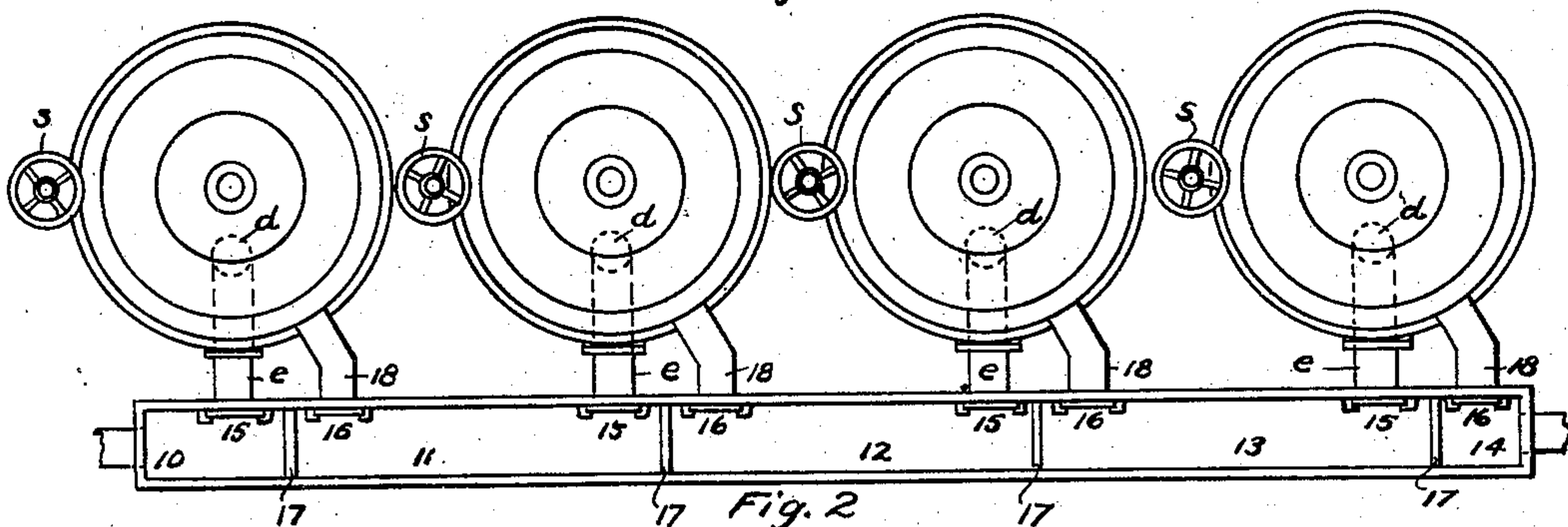


Fig. 2

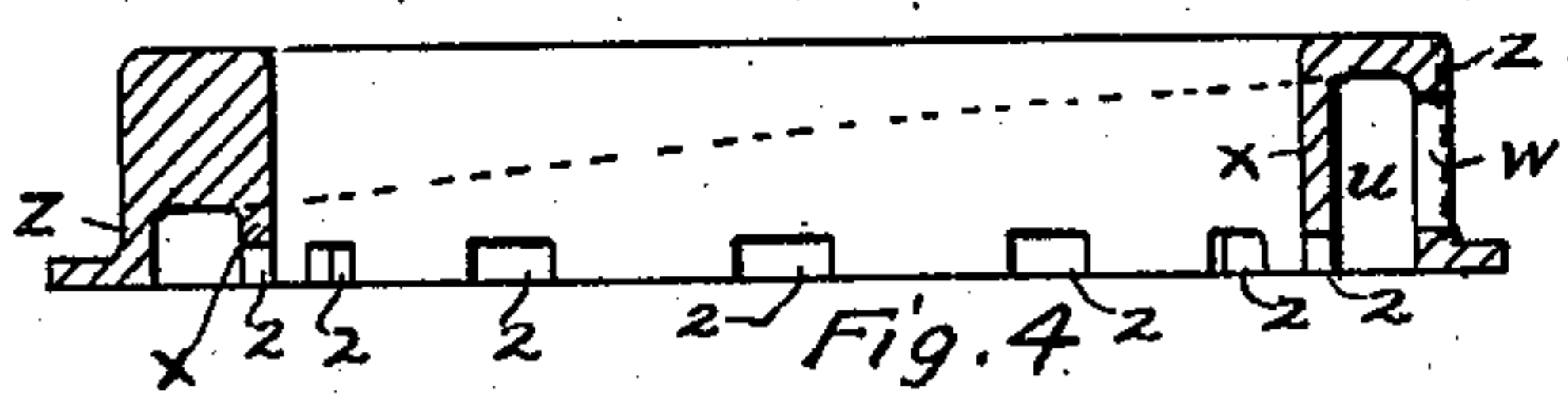


Fig. 4

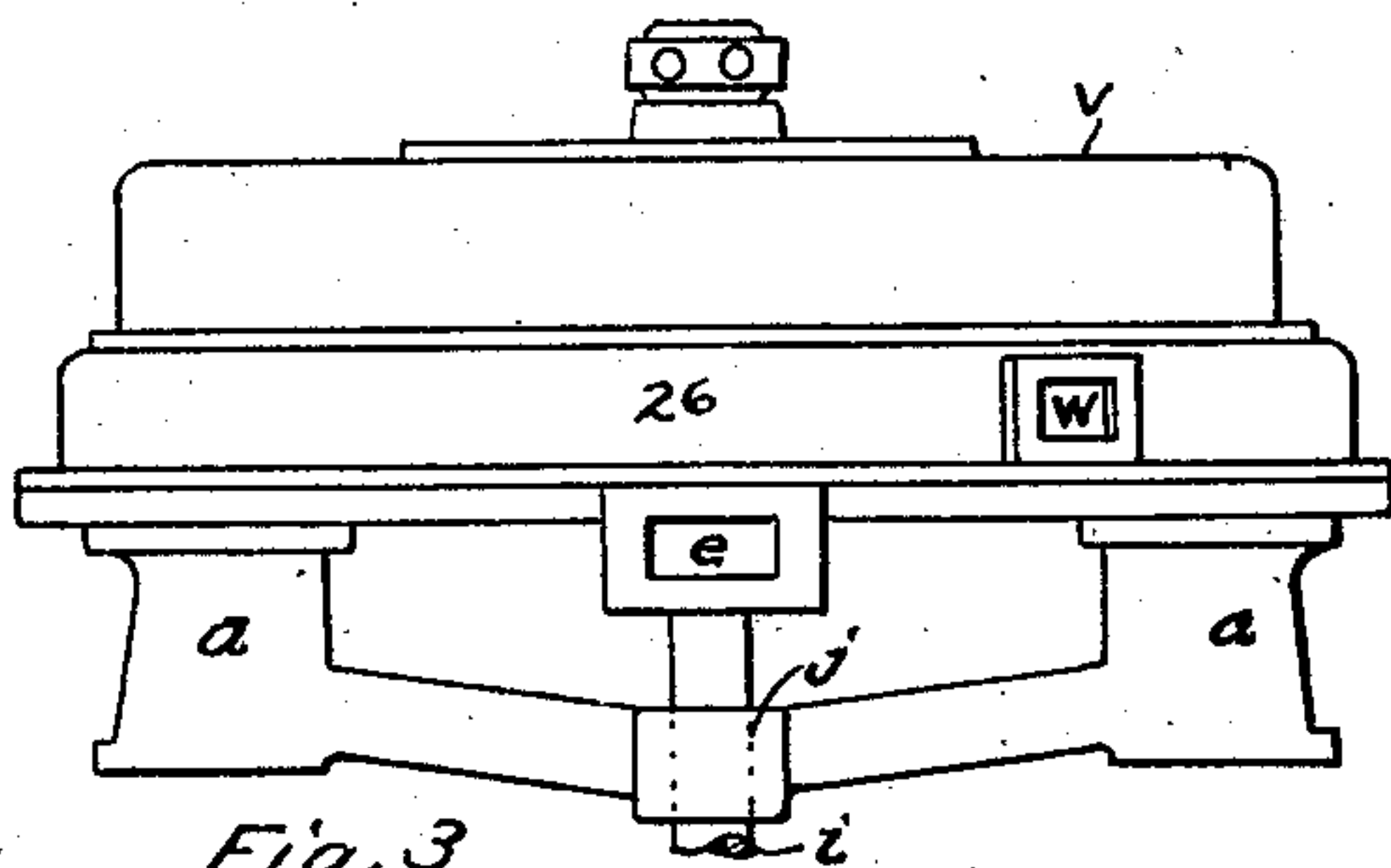


Fig. 3

Witnesses.

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JOHN E. WARREN, OF WESTBROOK, MAINE, ASSIGNOR TO SAMUEL D. WARREN AND MORTIMER B. MASON, OF BOSTON, MASSACHUSETTS, AND FISKE WARREN, OF HARVARD, MASSACHUSETTS, COPARTNERS AS THE FIRM OF S. D. WARREN & COMPANY.

BEATING-ENGINE.

No. 860,169.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed May 31, 1907. Serial No. 376,511.

To all whom it may concern:

Be it known that I, JOHN E. WARREN, a citizen of the United States, residing at Westbrook, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Beating and Similar Engines; and I hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to engines for reducing and refining or treating paper stock and similar material.

It is designed primarily as an improvement upon the beating engine described and claimed in Letters Patent of the United States of America, No. 787,063, granted to me April 11, 1905, but may be used upon other similar engines for similar and other purposes wherein circular revolving disks are used.

It consists of means whereby the material to be treated may be subjected to more uniform treatment and the outward flow of the material, after it has been treated by the engine, may be regulated and more perfectly controlled.

In the drawing: Figure 1 is a vertical transverse section of the machine in which I have embodied my improvement; Fig. 2 is a top plan showing four engines in series, mixing box and connection; Fig. 3 is a side elevation of the engine showing the curb and outlet; and Fig. 4 is a vertical transverse section of the curb showing its inlet ports.

In the drawing is shown the beating engine shown and described in said Letters Patent which may be described as follows: Upon suitable supports *a, a*, is fixed the bed-plate *b*, (see Fig. 1,) which at the center is provided with a circular opening for the reception of the vertical shaft hereinafter described and also at a short distance from the center with an opening *d*, which is connected with the inlet-pipe *e*. An annular space about the edge of the bed-plate is formed by the metallic rings *f, f*, one on the outer and one on the inner edge of said annular space—each of said rings having dogs *a'* on the opposing faces. Above the bed-plate and substantially of the same diameter is a runner *g*, which is provided also with a central opening for the reception of said shaft and, in like manner with the bed-plate, with an annular space near the edge. The central portion of the runner is elevated, thus forming with the bed-plate a central chamber. At intervals upon the under side of the runner in the space between the opening for the shaft and the inner edge of the annular space are located the wings *h, h*. The runner is supported by a vertical shaft *i*, which is provided with a sleeve *j*, which rests upon the central portion of the bed-plate, while the shaft is supported upon the step *k*, which is provided with a screw *l*, engaging the bev-

eled gear *m*, which in turn meshes with the beveled gear *n* on the horizontal shaft *o*, on the other end of which is a beveled gear *p*, which meshes with the beveled gear *q* on the vertical shaft *r*, which is surmounted by the hand-wheel *s*. The shaft *i* is also provided just above the step with a wheel or pulley *t* or similar means, whereby power may be communicated to the shaft. The annular spaces in the runner and in the bed-plate are supplied with knives which are separated to a greater or less extent by filling or separating pieces of wood or other material, the arrangement and character of the knives and separating pieces in the runner varying from those in the bed-plate as the nature of the work to be done by the engine varies.

In the Letters Patent above-mentioned the operative mechanism was inclosed in a solid curb through which was the outlet whereby the material, after being treated in my improved machine, is discharged. In my machine, I substitute for this curb a hollow curb or collecting ring which surrounds the runner, as shown in Fig. 1, providing within a conduit *u* which is preferably rectangular in cross-section. It consists of an inner and outer wall *x, z*, respectively, which are preferably made of one piece and tightly connected with the bed-plate *d*, all as shown in Fig. 1. The upper surface of said conduit gradually increases in height from its lowest point at the left of Fig. 1 in either direction until it reaches a point practically diametrically opposite as seen at the right-hand of Fig. 1. The inner wall *x* is provided with equal inlet ports *2, 2*, see Figs. 1 and 4 which connect with the space around the runners. The outlet port *w* is placed in the outer wall *z* of the curb at, or substantially at, the point where the upper surface of the conduit reaches its greatest height. The combined or aggregate area of the ports *2, 2*, are substantially equal to the area of the inlet port *e* and also to that of the outlet port *w* in the outer wall *z* of the curb. The inlet ports *a, a*, should be so located in the interior wall *x* of the hollow curb that the area of a cross-section of the conduit at any given point shall be substantially equal to the aggregate area of the inlet ports *2, 2*, between such given point of cross-section of the conduit and the point of the least height of the conduit.

The operation of the improved machine is obvious. After the material admitted through the inlet *e* has been treated by the revolving mechanism, it is thrown by centrifugal force outwardly against the inner wall of the curb whence it enters through the ports *2, 2*, into the hollow curb or conduit *u* in which it is retained until it flows from the outlet curb *w*. The outflow of the material which has been treated is thus regulated and made more gradual and the material to be treated is retained longer in the machine than if discharged

through a single opening in a solid curb. The location of the inlet ports 2, 2, in the inner wall of the hollow curb induces a constant and uniform flow of the material at all points and thus avoids setting and clogging.

The conduit of the hollow curb may be divided into two parts by means of a partition placed at a point opposite the outer port *w*. In such case, the portions of the conduit or hollow curb on either side of the partition gradually increase in section until its highest point at or near the outlet is reached, the material thus being allowed to reach the outlet *w* by a shorter route than if such partition were not in use.

When the engines are used in series, see Fig. 2, the outlet port *w* is connected with the pipe 18 in the same manner as described in said Letters Patent No. 787,063 already referred to.

My improved curb herein described and claimed may, it will be seen, be used in connection with any revolving engine wherein the material is treated by means of rotary disks, rotary arms or other rotary devices.

What I claim is

1. In combination with a rotary or revolving engine for beating stock or other purposes, a hollow curb provided with ports through its inner wall and an outer port through its outer wall, substantially as described.

2. In combination with a revolving engine for beating stock or other purposes, a hollow curb provided with ports through the inner wall thereof and one or more ports in its outer wall, substantially as described.

3. In combination with a revolving engine for beating stock or other purposes a curb inclosing a conduit provided with ports through its inner wall and openings in its outer wall, the upper surface of said conduit rising gradually on either side of one point of its diameter to a point substantially opposite, substantially as described.

4. In combination with a revolving engine for beating stock or other purposes, a curb having within a conduit provided with an outward opening or outlet and internal

openings, said conduit gradually increasing in section from a point opposite said outlet in each direction, substantially as described.

5. In combination with a revolving engine for beating stock or other purposes, having an inlet for the reception of the material to be treated, a hollow curb surrounding said engine and provided with an outlet in its outer wall and having in its inner wall a series of openings, the aggregate area of which is substantially equal to the area of said inlet, substantially as described.

6. In combination with a revolving engine for beating stock or other purposes, having an inlet for the reception of the material to be treated, a hollow curb surrounding said engine and provided with an outlet in its outer wall and having in its inner wall a series of openings, the aggregate area of which is substantially equal to the area of said outlet, substantially as described.

7. In combination with a revolving engine for beating stock or other purposes, having an inlet for the reception of the material to be treated, a hollow curb surrounding said engine and provided with an outlet in its outer wall and having in its inner wall a series of openings, the aggregate area of which is substantially equal to the area of said inlet and also substantially equal to the area of said outlet, substantially as described.

8. In combination with a revolving engine for beating stock or other purposes having an inlet for the reception of the material to be treated, a curb surrounding said engine having a conduit within provided with an outlet or discharge port, which conduit gradually increases in height on either side of a point opposite said outlet or discharge port, inlet ports in the inner wall of said conduit of such size or so located that the area of the cross-section of said conduit at a given point shall be substantially equal to the aggregate of the areas of the inlet ports located between the point of said cross-section and the point of the smallest section of said conduit, substantially as described.

In testimony, that I claim the foregoing as my invention I have hereunto set my hand this twenty-eighth day of May, A. D. 1907.

JOHN E. WARREN.

Signed in presence of:
JAMES B. PARSONS,
GEO. E. BIRD.