

No. 696,768.

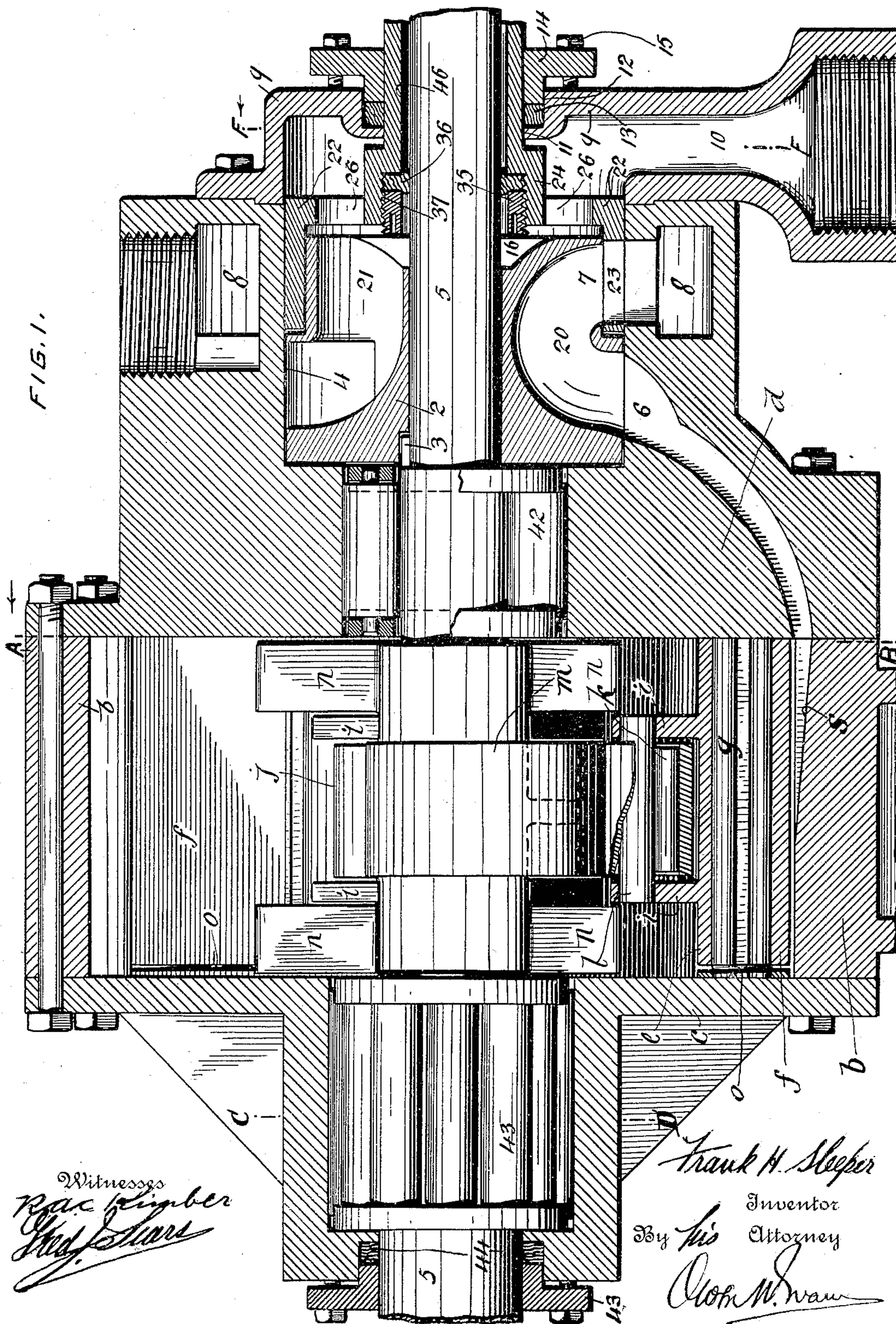
Patented Apr. 1, 1902.

F. H. SLEEPER.
ENGINE.

(Application filed Oct. 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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2 Sheets—Sheet 2.

FIG. 2.

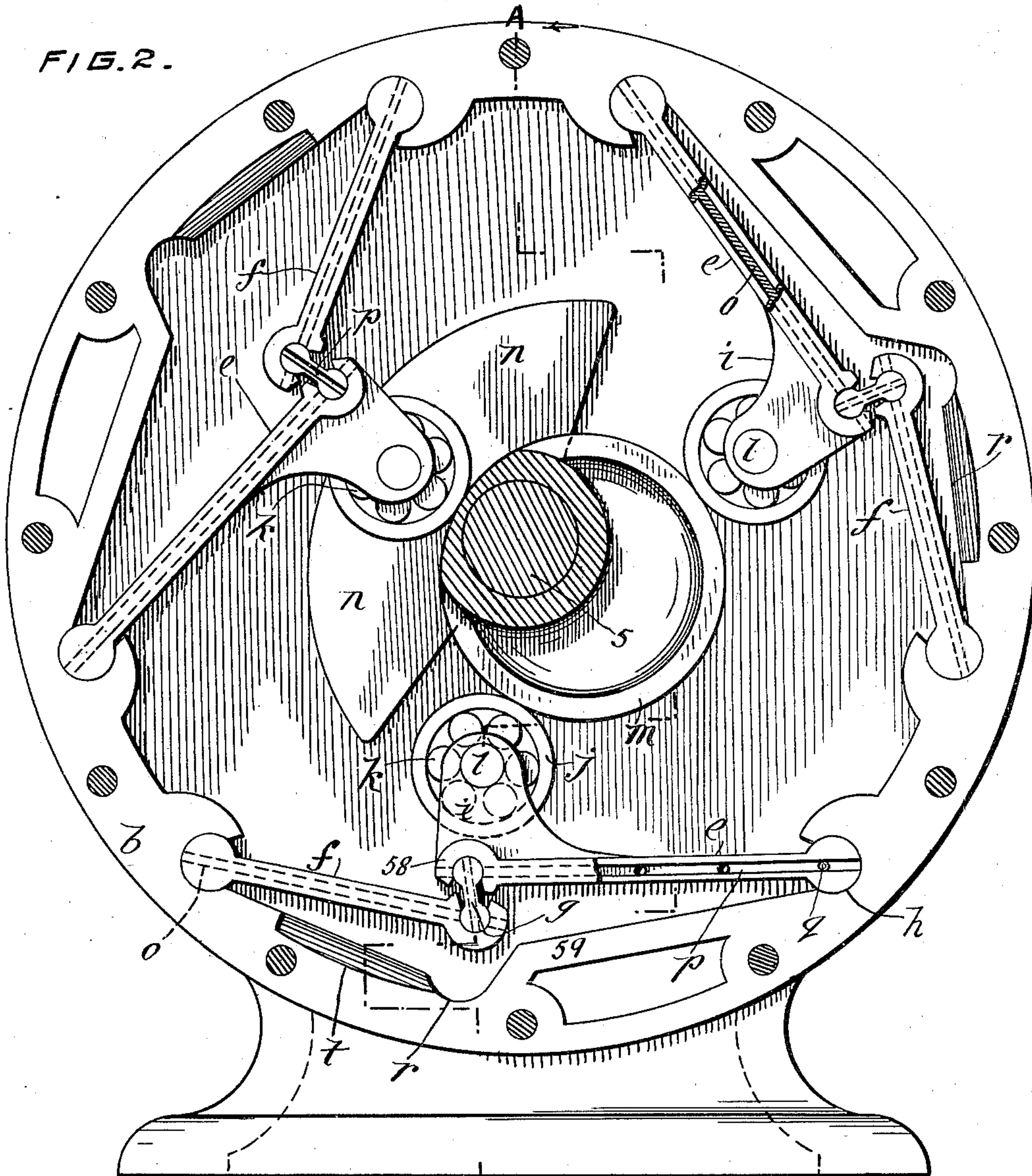


FIG. 3.

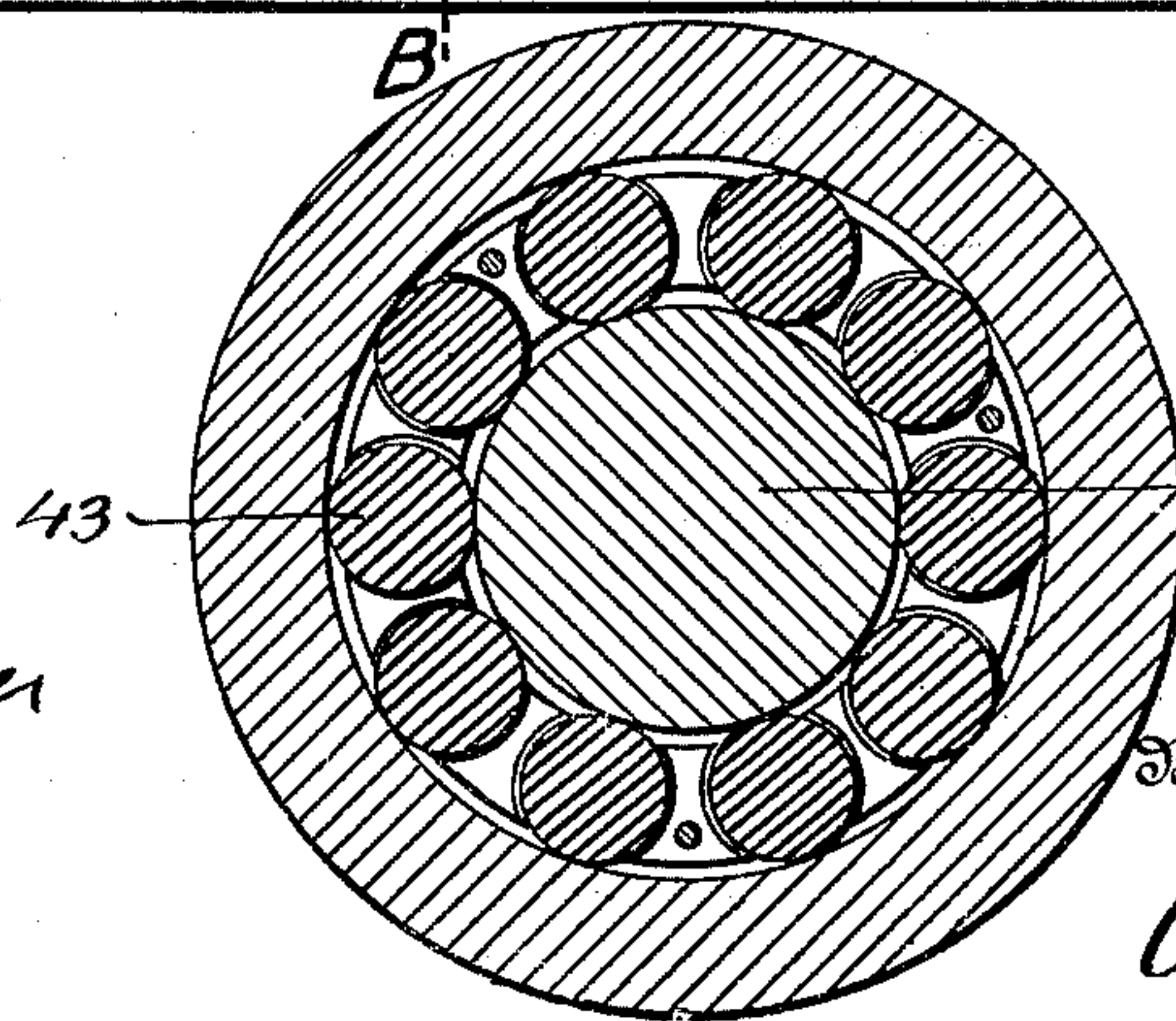
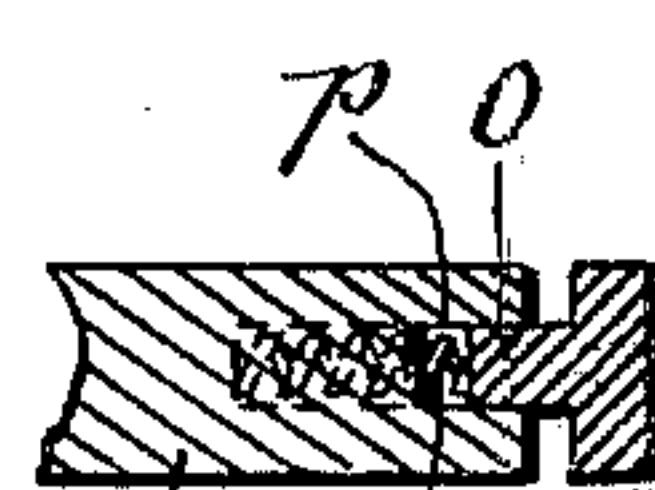


FIG. 4.



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UNITED STATES PATENT OFFICE.

FRANK HENRY SLEEPER, OF WESTMOUNT, CANADA, ASSIGNOR OF ONE-HALF TO THE NORTH WEST SHOE COMPANY, LIMITED, OF MONTREAL, CANADA, A CORPORATION.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 696,768, dated April 1, 1902.

Application filed October 15, 1901. Serial No. 78,762. (No model.)

To all whom it may concern:

Be it known that I, FRANK HENRY SLEEPER, of the town of Westmount, Province of Quebec, Canada, have invented certain new and useful Improvements in Engines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My present invention relates to the type of engine disclosed in my pending applications filed, under No. 34,772, on October 29, 1900, and No. 41,925, on January 2, 1901; and the invention has for its object to render the expansible chambers more steam-tight, to reduce the friction between the yielding wall of each expansible chamber and the shaft, and to facilitate the conversion of the thrust of the yielding walls into a rotative force acting upon the shaft.

The invention may be said, briefly, to consist in positively connecting to one another the component parts of each yielding wall and mounting a cam rigidly upon the shaft to receive the thrust of the yielding walls, which thrust is transmitted through an anti-friction-roller carried upon each yielding wall and bearing upon said cam, while an edge packing of T cross-section prevents leakage between the side edges of the blades and the portions of the stationary walls of the chambers.

For full comprehension, however, of the present embodiment of my invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate the same parts, and wherein—

Figure 1 is a transverse vertical sectional view of an engine constructed according to this embodiment, taken on line A B, Fig. 2. Fig. 2 is a longitudinal or axial sectional view taken on line A B, Fig. 1; and Fig. 3 is a cross-section taken on line C D, Fig. 1. Fig. 4 is a detail cross-section of the packing edge of one of the blades.

The cylinder may be constructed similarly to that illustrated in my above-mentioned pending applications, and consists of a central or body portion *b* and heads *c* and *d*. The chambers, which are complete in themselves, consist each of a stationary wall con-

stituted by the portion of the body *b* and heads *c* and *d*, inclosed by a yielding wall. Each yielding wall consists of a pair of blades *e* and *f*, respectively, each formed at one end with a bead *g*, cored out longitudinally to form a socket and a link-plate *h*, corresponding in width to these blades and having each of two of its opposite edges formed with a bead *k*, said beads *k* taking into the sockets *g* and forming knuckle-joints.

The thrust of the flexible walls, due to the admission of steam to the chamber, is imparted to the shaft through the medium of the antifriction-roller *j* and the cam *m*. The lugs *i*, roller *j*, cam *m*, and counterweights *n* are less in combined width than the space between the heads *c* and *d* to avoid the friction that would exist if the counterweights *n* were to bear at their outside faces upon said heads.

A tight packing is provided between the blades and link-plate and the cylinder-heads *c* and *d* by setting strips of T cross-section with their flanges *o* in grooves *p* in one edge of each blade and link-plate, the bearing-face of each strip being caused to bear tightly upon the cylinder-heads by a series of springs *q*.

What I claim is as follows:

1. An engine comprising a casing; a pair of heads closing the ends of said casing; a shaft extending through said casing; a pair of blades pivotally connected at one side edge of each to the interior of said casing, the opposite side edges of said blades overlapping one another; a link-plate joining the overlapping edges of said blades and the other side edges of said blades being in contact with said heads; an intermediary between the said shaft and said blades, and an expansile-fluid supply to and exhaust from the space between said blades and the portion of the casing covered thereby.

2. An engine comprising a casing; a pair of heads closing the ends of said casing; a shaft extending through said casing; a series of pairs of blades pivotally connected at one side edge of each to the interior of said casing; the opposite side edges of the blades of each pair overlapping one another; a link-plate joining the overlapping edges of said blades and the

other side edges of said blades being in contact with said heads; an intermediary between the said shaft and each pair of blades, and an expansile-fluid supply to and exhaust 5 from the space between each pair of blades and the portion of the casing covered thereby, substantially as described.

3. An engine comprising a casing; a pair of heads closing the ends of said casing; a shaft 10 extending through said casing; a series of pairs of blades pivotally connected at one side edge of each to the interior of said casing, the opposite side edges of the blades of each pair overlapping one another and the other side 15 edges of said blades being in contact with said heads; the blades adjacent to the shaft being each provided with an antifriction-roller; a cam rigidly upon the shaft upon which each of said antifriction-rollers bears, 20 and an expansile-fluid supply to and exhaust from the space between each pair of blades and the portion of the casing covered thereby, substantially as described.

4. An engine comprising a casing; a pair of 25 heads closing the ends of said casing; a shaft extending through said casing; a series of pairs of blades pivotally connected at one side edge of each to the interior of said casing, the opposite side edges of the blades of each pair 30 overlapping one another and being connected together by a link-plate, and the side edges of said blades being in contact with said heads; the blades adjacent to the shaft being each

provided with an antifriction-roller; a cam 35 rigidly upon the shaft upon which each of said antifriction-rollers bears, and an expansile-fluid supply to and exhaust from the space between each pair of blades and the portion of the casing covered thereby, substantially 40 as described.

5. An engine comprising a casing of interior 45 hexagonal form and recessed at its alternate angles and a pair of heads closing the ends of said casing; a shaft extending through said casing; a series of pairs of blades pivotally connected at one side edge of each to 50 the interior of said casing at the other angles, the opposite side edges of the blades of each pair overlapping one another and being connected together by a link-plate, and the other 55 side edges of said blades being in contact with said heads, the blades adjacent to the shaft being each provided with an antifriction-roller; a cam rigidly upon the shaft upon which each of said antifriction-rollers bears, 55 and an expansile-fluid supply to and exhaust from the space between each pair of blades and the portion of the casing covered thereby, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses. 60

FRANK HENRY SLEEPER.

Witnesses:

WILLIAM P. McFEAT,
FRED. J. SEARS.