

No. 711,965.

Patented Oct. 28, 1902.

E. E. HENDRICK.
PUMP.

(Application filed May 29, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

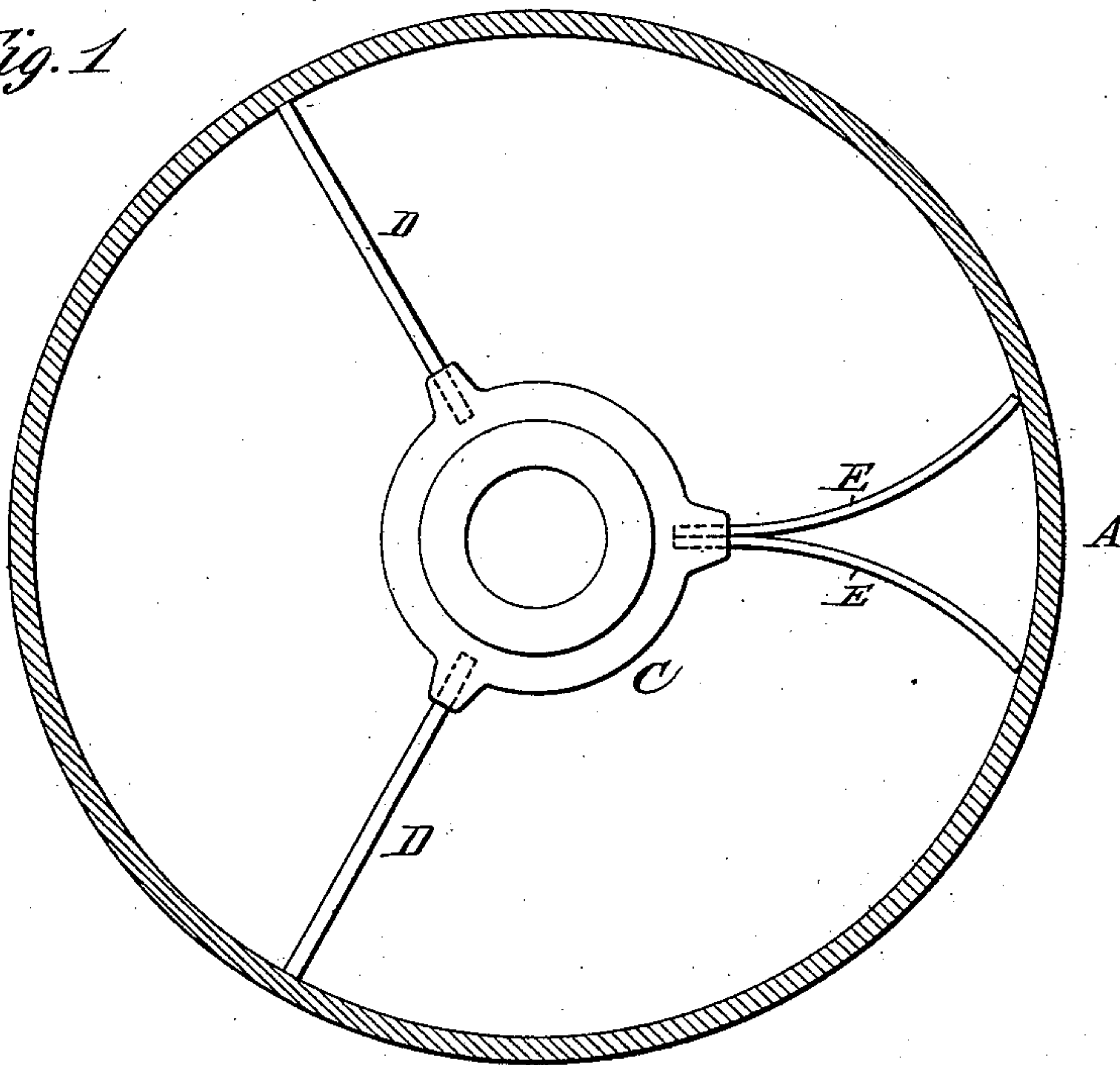
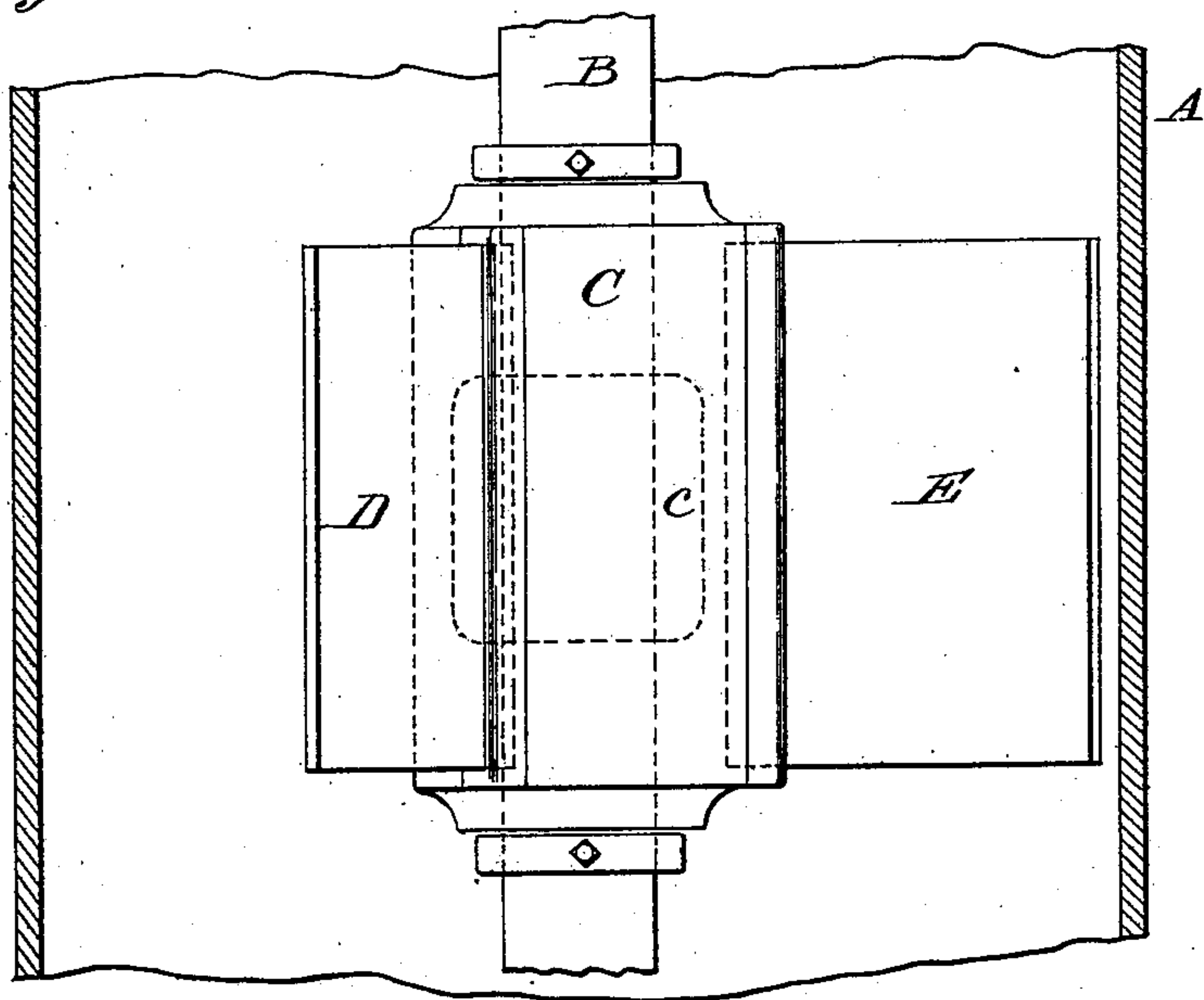


Fig. 2



Witnesses:

Jas. F. Coleman
Archibald F. Peere

Inventor

Eli E. Hendrick
By *Ryan, Edmund & Ryan*
Att'ys.

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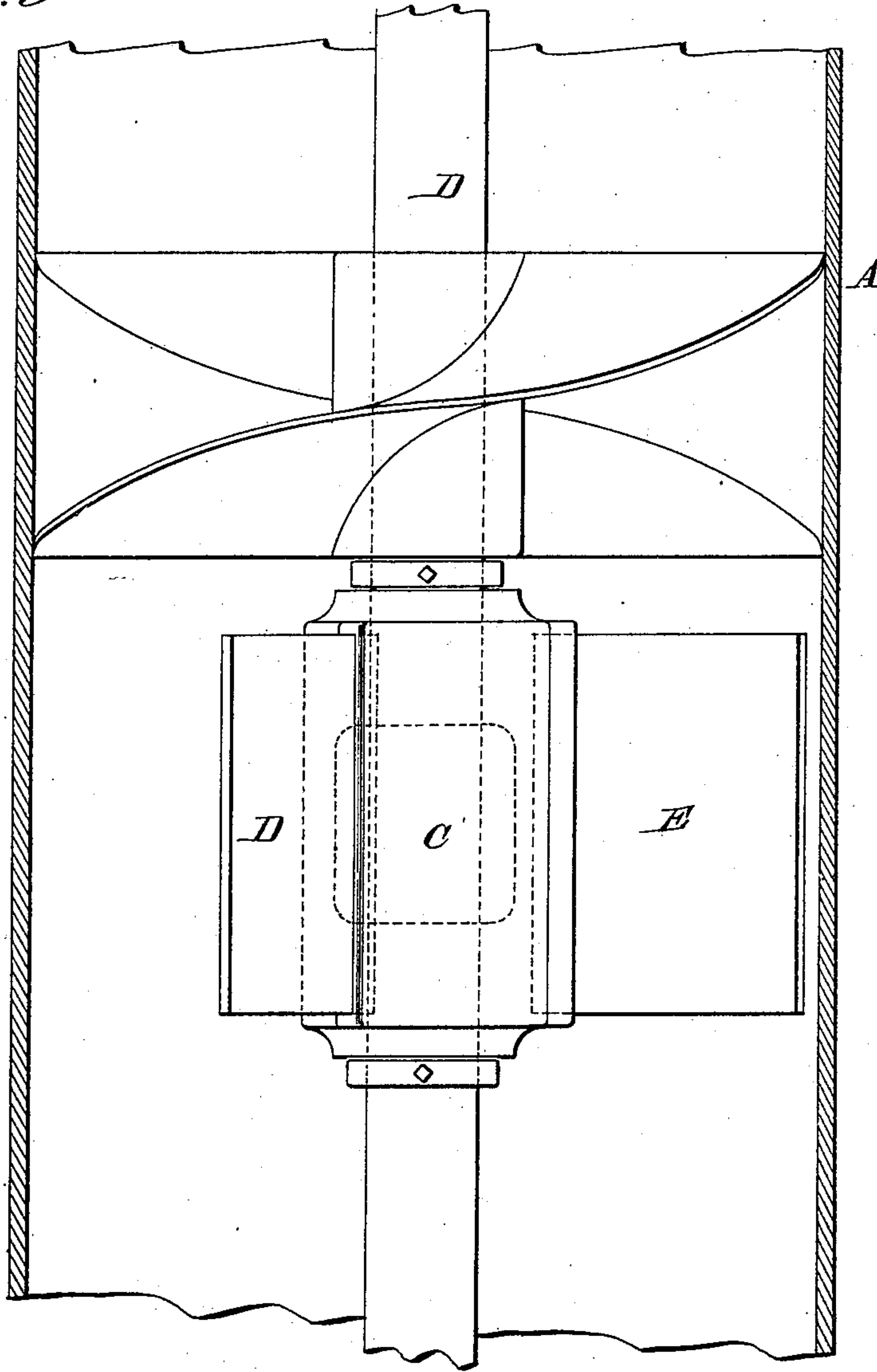
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2 Sheets—Sheet 2.

Fig. 3



Witnesses:

John F. Coleman
John Robt Taylor

Inventor

E. E. Hendrick
By R. W. Edwards & R. W. R.
Attorneys

UNITED STATES PATENT OFFICE.

ELI E. HENDRICK, OF CARBONDALE, PENNSYLVANIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 711,965, dated October 28, 1902.

Application filed May 29, 1901. Serial No. 62,306. (No model.)

To all whom it may concern:

Be it known that I, ELI E. HENDRICK, a citizen of the United States, residing at Carbon-
dale, in the county of Lackawanna and State
5 of Pennsylvania, have invented a certain new
and useful Improvement in Pumps, of which
the following is a description.

This invention relates particularly to that
class of pumps in which are employed a cas-
10 ing, either continuous or formed in sections,
a shaft within the casing driven by a suitable
motor, and propellers mounted at intervals
upon such shaft for the purpose of elevating
water or other liquid within the casing. In
15 pumps of this type it is essential that the ro-
tary shaft be provided, preferably at points
adjacent to the propellers, with means for
centering it within the casing, and since the
shaft, its centering mechanism, and propellers
20 are assembled and then forced bodily into the
pump-casing it has been customary to so con-
struct such mechanism as that it will main-
tain its position by coaction with the interior
of the pump-casing.

25 Heretofore it has been proposed to employ
for the purpose of centering a pump-shaft and
guiding the water within the casing a com-
bined bearing and guide comprising a hub
and outwardly-extending, curved, and resili-
30 ent arms or vanes, the latter when free from
the pump-casing being of greater diameter
than such casing, but being compressed or
sprung in in order to permit the pump-shaft
and its attached mechanism to be inserted in
35 position. In this construction the outwardly-
extending arms or vanes are designed not
only to support the bearing and center the
shaft, but also to guide the water within the
pump-casing and to prevent the same from
40 swirling. The construction thus described
has proved defective in several respects,
among which are the following: Where sev-
eral arms or vanes are employed upon each
bearing, it is of the utmost importance that
45 the material employed in all of these be of
the same quality, degree of resiliency, &c.;
otherwise the bearing and the shaft passing
through it will not be accurately maintained
in the center of the casing. Again, where
50 such arms or vanes are curved as well as re-
siliant they frequently fail to remain rigid in
the pump-casing while the shaft is in opera-
tion, but, on the contrary, are caused to re-

volve with such shaft, thereby becoming so
worn as to no longer support the shaft in the 55
true center of the casing. In the present in-
vention these objections to and defects in pre-
existing structures are removed. In such in-
vention is employed a combined water-guide
and shaft-centering mechanism comprising a 60
hub or bearing having outwardly-extending
arms, certain of which are non-resilient and
are of such length as that when their free
ends are in contact with the interior of the
casing the hub or bearing shall be in the cen- 65
ter of the pump-casing. Another arm (al-
though there may be more than one) extends
outwardly from the hub and is so formed as to
exert yielding pressure against the interior
of the casing, thereby forcing the arms first 70
named into contact with the casing upon the
other side of said hub and fixing the position
of said hub in the center of the casing.

In a preferred embodiment of the inven-
tion I construct the guide and bearing of cast 75
metal, forming two of the arms integral with
the hub. I further provide the hub opposite
said rigid arms with spring-arms, preferably
of steel or other resilient metal and curved
in opposite directions. At their inner ends 80
the latter are rigidly secured by any suitable
means to the hub, while their free ends are
so arranged as to bear some distance apart
against the interior of the pump-casing, there-
by pressing the integral guide-arms against 85
the interior of the casing and maintaining
the hub or bearing in the exact longitudinal
center of the pump.

The invention is illustrated in the accom-
panying drawings, in which— 90

Figure 1 is a horizontal section, and Fig. 2
a longitudinal section, of a portion of a pump-
casing with my improved guide and bearing
located therein.

Referring to the figures, in which similar 95
letters denote corresponding parts, A desig-
nates the pump-casing, and B the shaft lo-
cated therein. This shaft is provided at suit-
able intervals throughout its length with
bearings comprising a hub C, which may have 100
an internal recess or chamber *c* for the re-
ception of a suitable lubricant. It may also,
if desired, be provided with an internal core
or bushing (not shown) of high-fusion metal
or other suitable material. 105

Extending outwardly from the hub C (in

the present instance radially) are two arms D D. As here shown, the hub C is cast about the inner ends of the arms D; but it is obvious that the latter may be secured to the hub in any other suitable manner. The arms D are of such length that when their free ends are in contact with the interior of the casing the hub C is in the exact longitudinal center of the pump-casing.

On the opposite side of the hub from the arms D are arranged curved resilient arms E, (in this instance two,) the inner ends of which are secured to the hub C, (preferably by casting such hub about such ends,) while their free ends extend outwardly in such position as to make contact with the interior of the casing, and when making such contact these arms exert yielding pressure against the hub C, and therefore against the arms D, so as to maintain the former in the longitudinal center of the pump-casing and the latter in intimate contact with the interior of such casing. As here shown, the arms E bear against the interior of the casing at somewhat distant points, such arms being curved in opposite directions. Due to this construction the tendency of the combined guide and bearing to turn within the casing under the influence of the rotary shaft is minimized. The water which is set in swirling motion by the action of the propellers is interrupted and forced to pass upwardly within the casing either in a true perpendicular or with a tendency to movement in a direction opposed to its direction before reaching the guides.

Although I have illustrated and described the arms D as radial and substantially perpendicular, I do not desire to be limited in this respect, for such arms may, if desired, be inclined or curved.

What I claim is—

1. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing, and two arms secured together at said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

2. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing, and two spring-arms secured together at said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

3. In a pump, the combination with a cas-

ing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending radially from said hub and coacting with the interior of said casing and two curved spring-arms secured together at said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

4. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing and two curved spring-arms secured together at said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

5. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing and two arms curved in opposite directions and secured to said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

6. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing and two resilient arms curved in opposite directions and secured to said hub and exerting yielding pressure against the interior of said casing, substantially as set forth.

7. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing and two arms secured together at their point of attachment to said hub, their free ends being separated and coacting with the interior of said casing, substantially as set forth.

8. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hub and coacting with the interior of said casing and two resilient arms secured together at their point of attachment to said hub, their free ends being separated and coacting with the interior of said casing, substantially as set forth.

This specification signed and witnessed this 27th day of May, 1901.

ELI E. HENDRICK.

Witnesses:

J. R. VANDERFORD,
L. M. SMITH.