

H. H. MacTAGGART AND R. G. SCOTT,

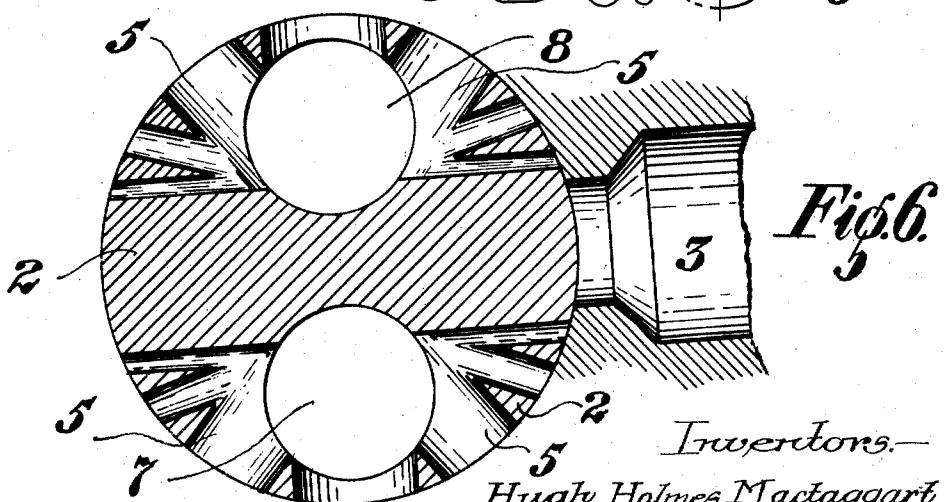
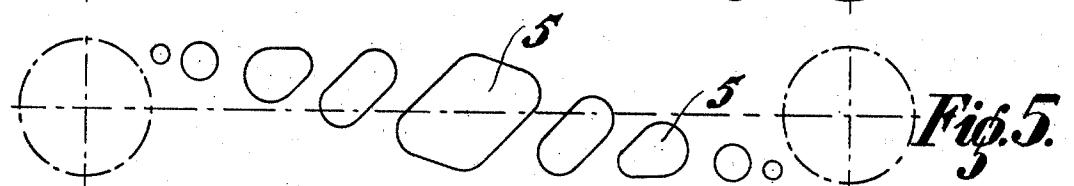
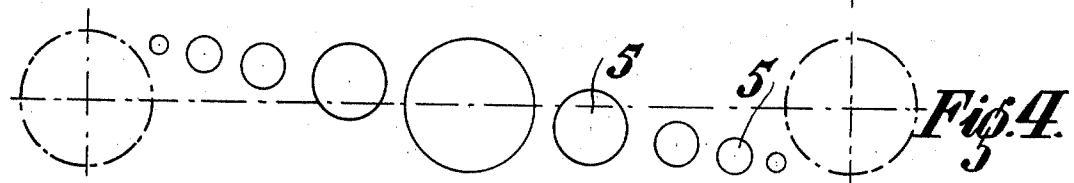
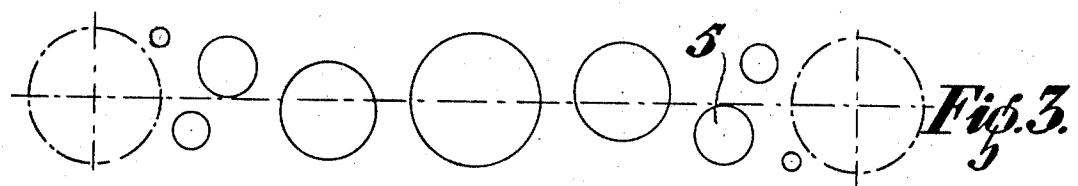
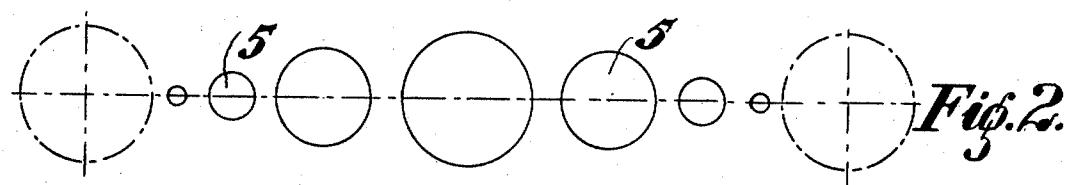
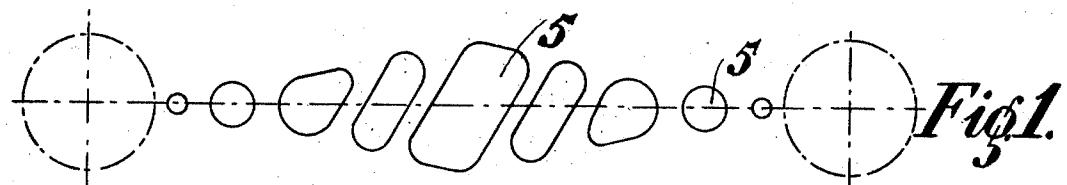
ROTARY PUMP AND MOTOR.

APPLICATION FILED JULY 24, 1919.

1,360,128.

Patented Nov. 23, 1920.

2 SHEETS—SHEET 1.



5 Invertors.—
H. Holmes Mactaggart.

Hugh Holmes Mactaggart,

Robert Grigor Scott

by their Attorneys-
Howard & Howard

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2 SHEETS—SHEET 2.

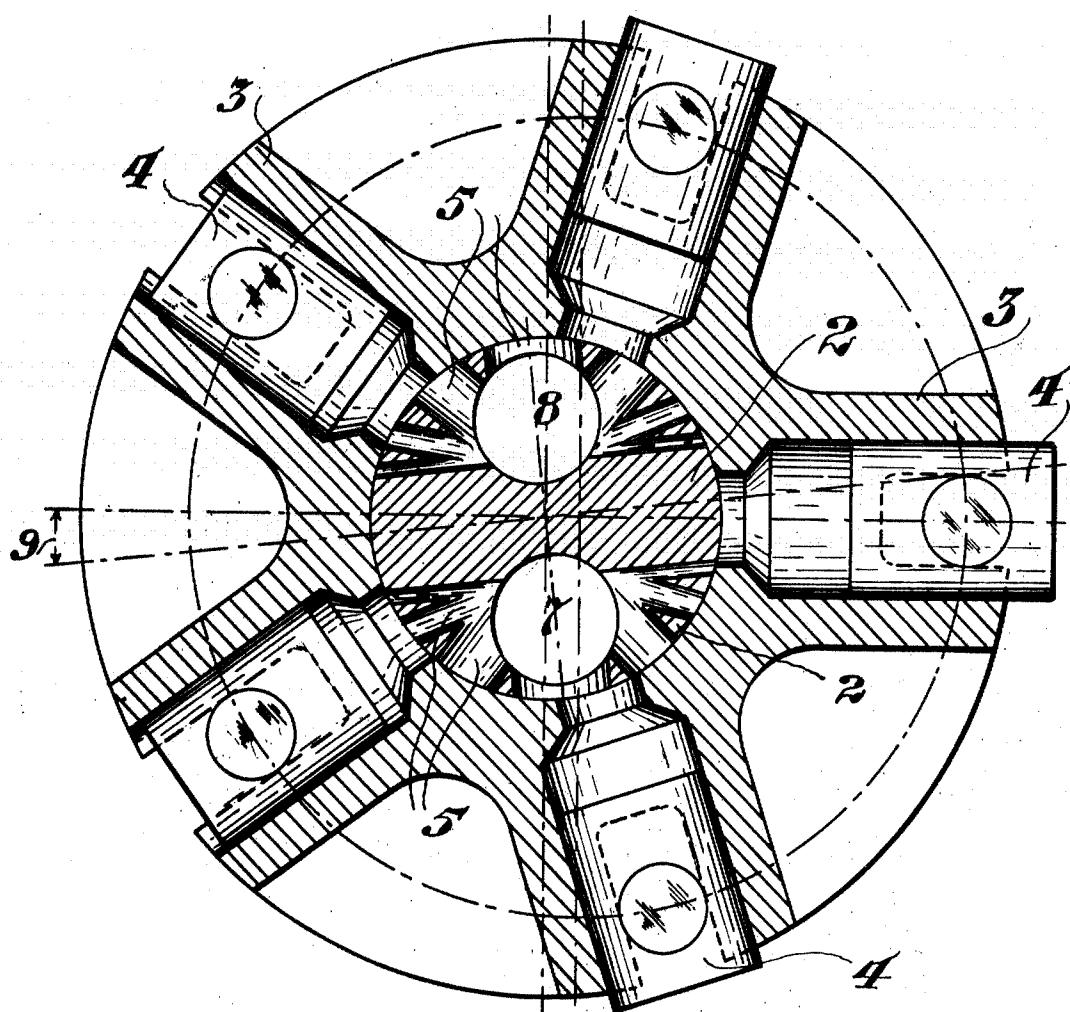


Fig. 7.

Inventors.

*Hugh Holmes MacTaggart,
Robert Grigor Scott,
by their Attorneys.—
Aronow & Aronow*

UNITED STATES PATENT OFFICE.

HUGH HOLMES MACTAGGART AND ROBERT GRIGOR SCOTT, OF LOANHEAD, SCOTLAND.

ROTARY PUMP AND MOTOR.

1,360,128.

Specification of Letters Patent. Patented Nov. 23, 1920.

Application filed July 24, 1919. Serial No. 313,086.

To all whom it may concern:

Be it known that we, HUGH HOLMES MAC-
TAGGART and ROBERT GRIGOR SCOTT, subjects
of the King of Great Britain and Ireland,
5 and residing at Station Iron Works, Loan-
head, Midlothian, Scotland, have invented
Improvements in and Relating to Rotary
Pumps and Motors, of which the following
is a specification.

10 This invention has reference to improve-
ments in and relating to rotary pumps and
motors.

And in order that our invention and the
manner of carrying the same into practice
15 may be properly understood we have here-
unto appended two sheets of explanatory
drawings.

In these drawings Figures 1 to 5 each
show diagrammatic views of half the cir-
20 cumference of the D tube around which the
cylinder body carrying the radial cylinders
rotates, so as to illustrate the various ways
in which the hole apertures can be arranged
25 in said tube to form the ports which com-
municate between the radial cylinders and
the suction and discharge passages.

Fig. 6 is a transverse section of the D
tube showing the arrangement of ports on
the pressure and suction sides.

30 While Fig. 7 on Sheet 2 is a transverse
section corresponding to Fig. 6 with the
cylinder body mounted axially thereon and
carrying five sets of radial cylinders.

Referring to these drawings:—

35 This invention has reference to improve-
ments in and relating to pumps and motors
of the rotary plunger type and particularly
that class wherein a cylinder body 1 is driven
by a prime mover and rotates about a sta-
40 tionary central spindle provided with pas-
sages and ports termed the D tube 2, the
D tube constituting the valve of the pump;
and wherein the pistons 4 within the radially
45 arranged cylinders 3 in cylinder body
1 derive their movement of reciprocation by
cooperation, without definite attachment,
with an eccentrically adjustable stroke con-
trolling ring or drum which revolves or
50 floats around in company with the cylinder
body 1; a reversal of direction of the fluid's
motion being obtained by moving this eccen-
tric ring from the one side to the other side
of the axis of rotation.

Heretofore in applying this construction
55 of pump in combination with the hydraulic
or other gears, great noise or sound has re-

sulted when the pumps are at full pressure
and speed, and the objective of the present
invention is to obviate or silence these sound
noises.

60 The usual practice has been to make the
ports of the D tubes with very little lap or
lead, namely, when each cylinder has fin-
ished its suction or discharge stroke its pis-
ton is on the dead center, and the cover 65
bridge between the suction and discharge
ports of the D tube is practically the same
width as the cylinder port. When the cylin-
der piston begins its discharge stroke the
liquid in it at a low pressure is at once sub- 70
jected to the full discharge pressure. At
the end of the discharge stroke the high
pressure liquid in each cylinder in turn
comes, for the aforesaid reason, in sudden
contact with the low pressure liquid on the 75
suction side port of the D tube. These sud-
den rises and falls in pressure cause severe
shocks and as there are usually 5 to 7 cylin-
ders rotating at a speed of 800 to 1000 revolu-
tions per minute the resultant sound is 80
very noisy.

Our improvements consist in arranging
a series of hole apertures 5 in the D tube 2
to form the ports which communicate be-
tween the radial cylinders 3 in cylinder body 85
2 and the suction and discharge passages, 7
and 8. These hole apertures 5 would prefer-
ably be formed of different or variable di-
ameters or areas and shapes, as particularly
shown in Figs. 1 to 5, and which has the 90
effect of allowing the high pressure to come
on the cylinder pistons on the discharge side
8 and off on the suction side 7 gradually,
thus reducing the shock. These holes 5,
95 would be formed and arranged to suit vari-
ous sizes and variable capacities of pumps,
as what suits one size may not be applicable
to another.

In combination with the arrangement for
forming the ports as aforesaid, an additional 100
improvement is obtained in some sizes of
pumps by giving advance to the D tube 2, as
indicated at 9 Fig. 6. Whenever the pistons
4 pass the horizontal line they commence
their suction or discharge stroke, but as the 105
center line of the D tube 2 is advanced rela-
tive to said line as indicated at 9, this makes
the cut-off on the suction side and the open-
ing to pressure a little late and this again
varies with the different sizes of pumps. 110

What we claim is:—

1. In rotary pumps and motors the com-

bination of a revoluble cylinder body formed with a series of radial cylinders and adapted to rotate on a fixed **D** tube and like valve, a series of hole apertures in said tube forming ports which communicate between the radial cylinders and the suction and discharge passages, so as to allow the high pressure to come on each cylinder on the discharge side and off on the suction side gradually and thus reduce shock and minimize sound, substantially as herein set forth.

2. In rotary pumps and motors in combination, a revoluble cylinder body formed with a series of radial cylinders and rotating on a fixed **D** tube and like valve, a series

of hole apertures in said tube forming ports which communicate between the radial cylinders and the suction and discharge passages so as to allow the high pressure to come on each cylinder on the discharge side and off on the suction side gradually and thus reduce shock and minimize sound, the **D** tube making the cut-off on the suction side and the opening to pressure a little late, substantially as herein set forth.

HUGH HOLMES MACTAGGART.
ROBERT GRIGOR SCOTT.

Witnesses:

EDWARD GIBB CLEMENT,
STEWART Ross.