

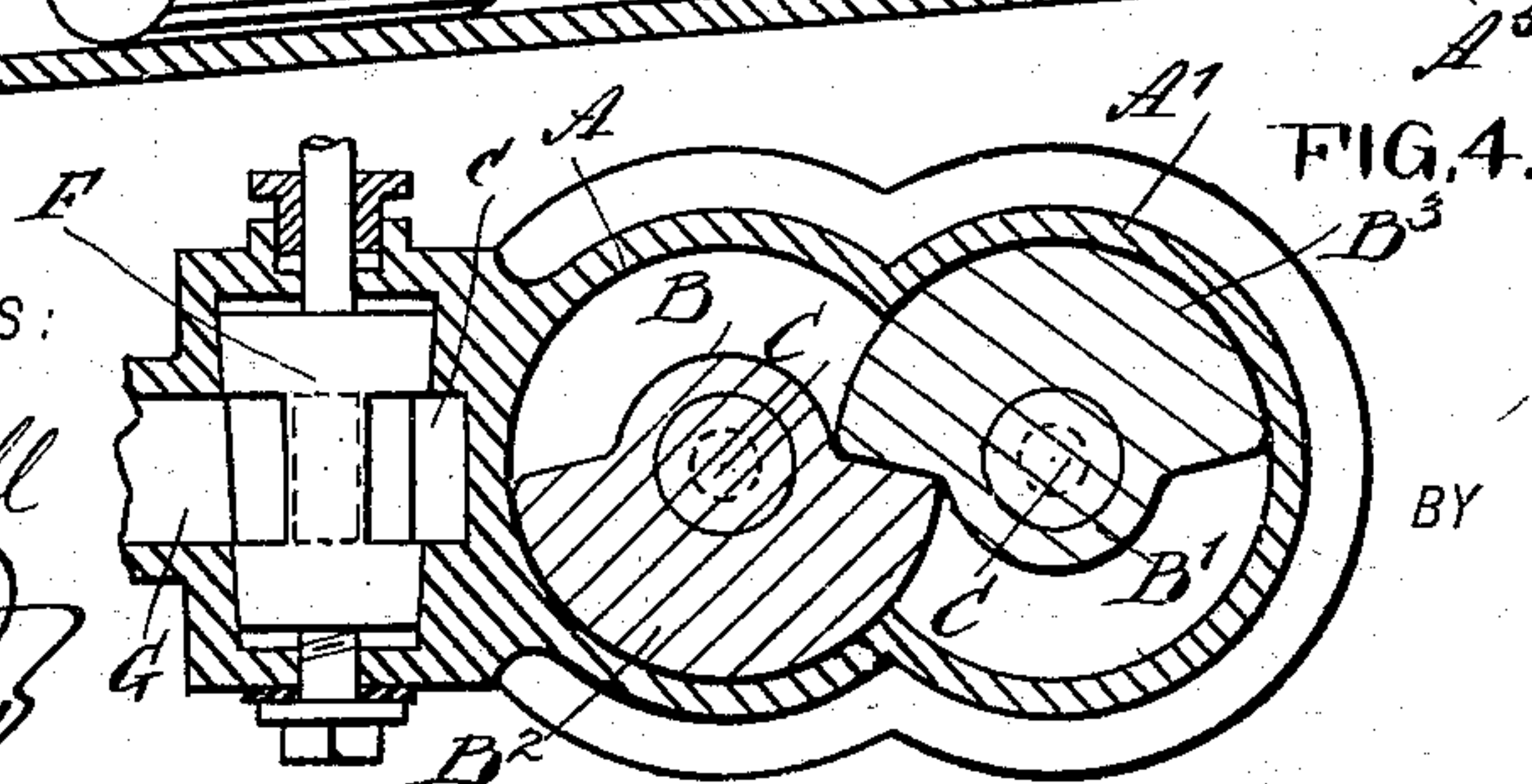
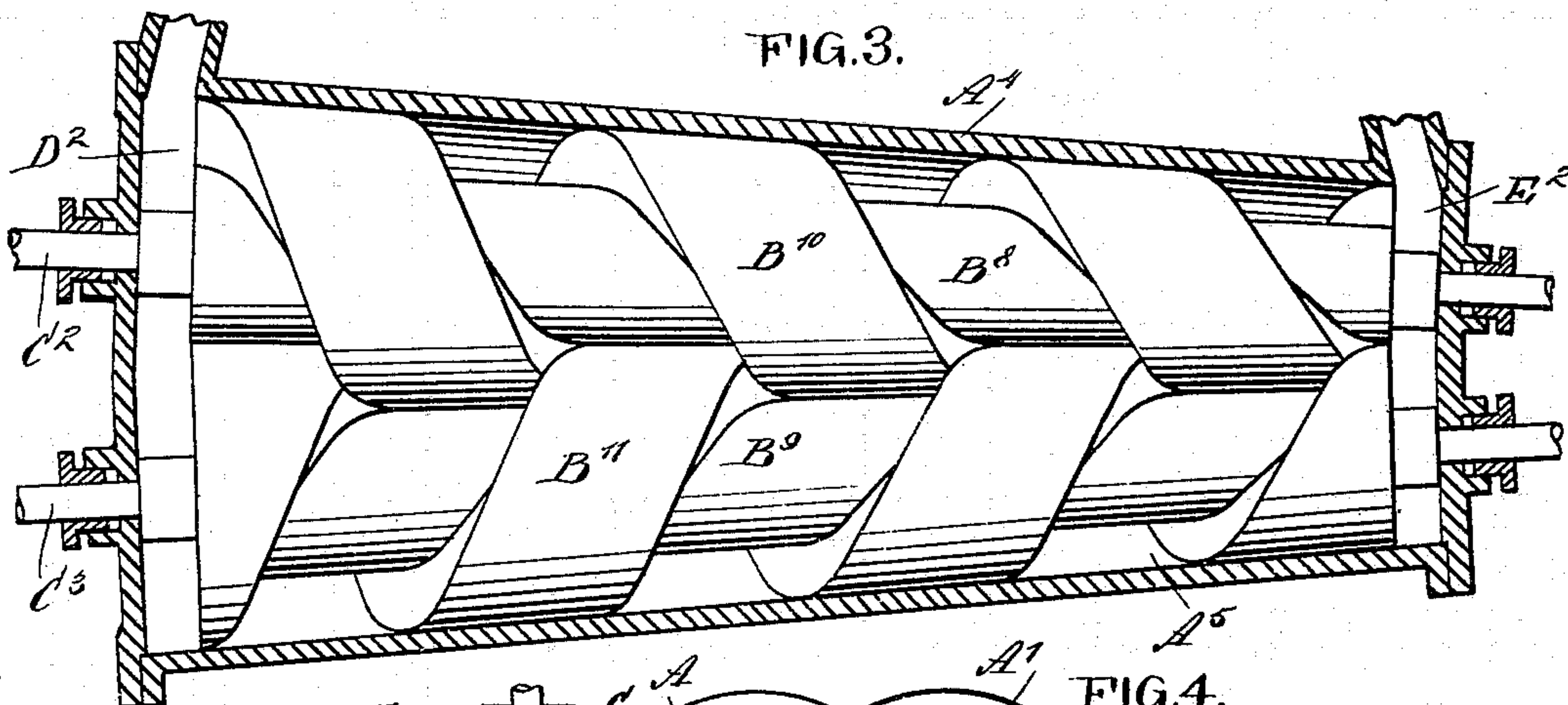
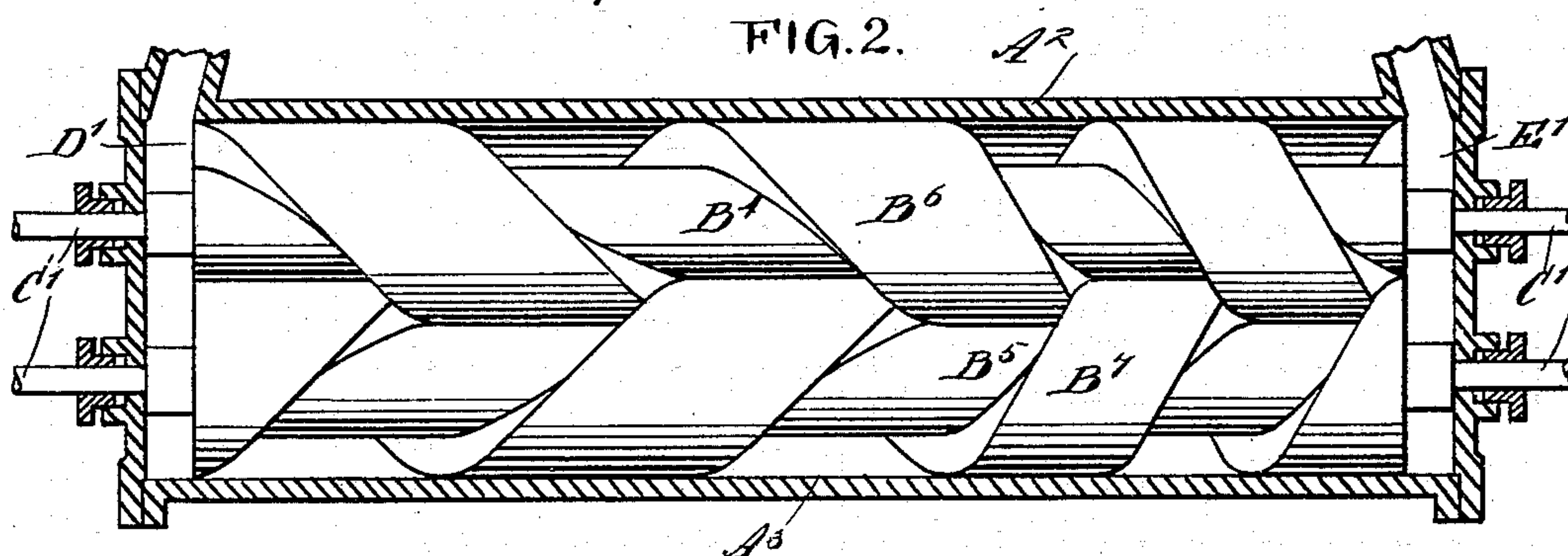
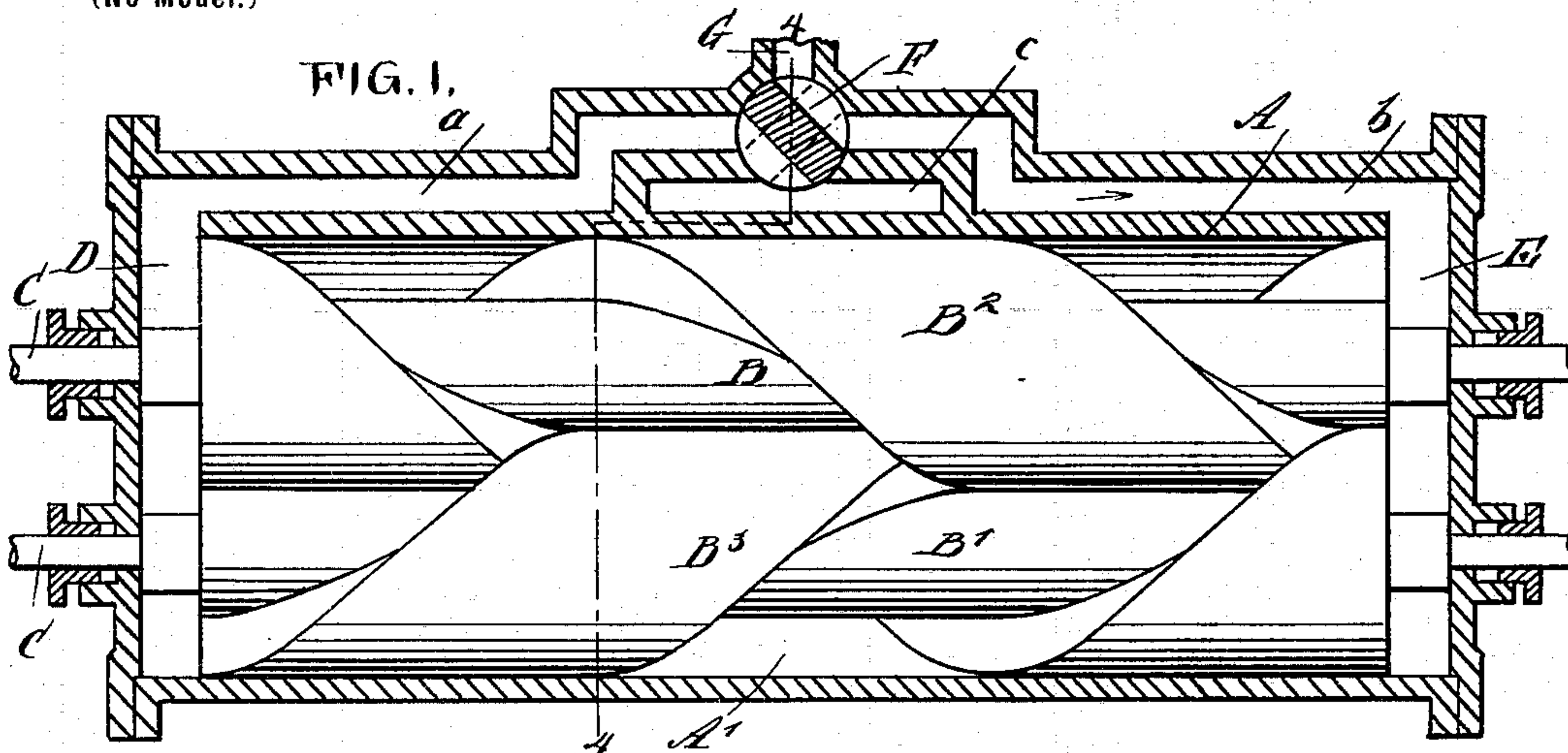
No. 612,304.

Patented Oct. 11, 1898.

A. N. BLAZER.
ROTARY ENGINE.

(Application filed July 22, 1897.)

(No Model.)



WITNESSES :

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UNITED STATES PATENT OFFICE.

ALMER N. BLAZER, OF MESCALERO, TERRITORY OF NEW MEXICO, ASSIGNOR
OF ONE-HALF TO FRANK I. OTIS, OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 612,304, dated October 11, 1898.

Application filed July 22, 1897. Serial No. 645,579. (No model.)

To all whom it may concern:

Be it known that I, ALMER N. BLAZER, of Mescalero, county of Dona Ana, and Territory of New Mexico, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved rotary engine which is simple and durable in construction, very effective in operation, and arranged to utilize the motive agent to the fullest advantage, and expansively, if desired.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional plan view of the improvement. Fig. 2 is a like view of a modified form of the improvement as arranged for using the steam expansively. Fig. 3 is a like view of another modified form of the improvement, and Fig. 4 is a transverse section of the improvement on the line 4 4 of Fig. 1.

As illustrated in Figs. 1 and 4, the rotary engine is provided with two cylinders A A', connected with each other longitudinally and preferably cast in one piece, as is plainly indicated in Fig. 4, with the heads of the cylinders bolted or otherwise secured to the ends of the cylinders, as is plainly indicated in Fig. 1.

In the cylinders A A' are mounted to turn in unison the pistons B B', provided on their peripheral surfaces with piston-heads B² B³, respectively, made spiral in form, one of said heads having a right-hand spiral groove and the other a left-hand spiral groove and one piston-head fitting into the groove formed by the piston-head of the other piston. The pistons B B' are secured on longitudinally-extending shafts C, journaled in suitable bearings on the cylinder-heads and connected at their outer ends with suitable machinery to be driven. The piston-heads terminate a suitable distance from the ends or heads of the cylinders, so as to form steam-chests D and E. The said chests D and E are con-

nected with ports a and b, leading to a reversing-valve F for connecting either of said ports with a steam-inlet pipe G and an exhaust-port c to direct the live steam into either chest D or E and to conduct the exhaust from the chests E or D to the exhaust-port c.

Now it is evident that when the valve F is in the position shown in full lines in Fig. 1 the live steam passes through the port b into the chest E and from the same into the spiral grooves of the pistons, so as to act on the piston-heads therein and rotate the same, the steam in following the groove in one piston pressing on the piston-head of the other piston until the steam finally passes into the chest D and from the same to the port a and valve F to the exhaust-port c and to the outside.

When it is desired to reverse the engine, the valve F is turned to the position shown in dotted lines in Fig. 1, so that the live steam passes through the port a into the chest D to then act on the pistons, so as to turn the same in the opposite direction and to be finally discharged into the chest E, from which the exhaust-steam can escape by way of the port b, valve F, and exhaust-port c to the outside.

When it is desired to utilize the steam expansively, then the arrangement shown in Fig. 2 is utilized, and this engine is provided with two cylinders A² A³, containing pistons B⁴ B⁵, having piston-heads B⁶ B⁷ mounted on shafts C', the spiral grooves of the piston-heads increasing in pitch from a steam-inlet chest E' toward an exhaust-chest D', so that the spiral grooves become larger to allow the steam to expand as it passes toward the exhaust-chest D'.

If desired, the cylinders A⁴ A⁵ may be made conical, as shown in Fig. 3, with the pistons B⁸ B⁹ arranged angularly to one another and with the piston-heads B¹⁰ B¹¹ increasing in diameter from the chest E² to the chest D². In this case the shafts C² C³ for the pistons diverge to render the device especially serviceable for use on marine vessels, in which the shafts C² C³ are for carrying twin propeller-screws, said shafts extending sufficiently apart at the stern of the vessel to accommodate two propeller-screws. It is evident that

the steam may be cut off at any desired point after it leaves the live-steam chest, it being understood that the pitch of the piston-head is made correspondingly longer or shorter for the purpose. The engine herein shown and described is very simple and durable in construction and is not liable to get out of order.

In the arrangement shown in Fig. 3 wear may be taken up by moving the pistons from the large or exhaust end toward the live or small end of the cylinder.

It is evident that other motive agent besides steam may be used to drive the engine, and the device may also be used as a pump.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A rotary engine comprising cylinders opening longitudinally into one another and pistons secured on longitudinally-extending shafts journaled in suitable bearings on the cylinder-heads and extending beyond the heads for connection with the machinery to be driven, the said pistons being mounted to turn in unison within the said cylinders and formed on their peripheries with spiral piston-heads running in opposite directions with one piston-head fitting into the spiral groove formed by the piston-head of the other piston, the said spiral grooves having a long pitch whereby the use of extra gearing for connecting the pistons is avoided, steam-chests at the ends of the cylinders into which open the ends of the spiral grooves of the pistons, the said steam-chests being provided with ports leading therefrom and a rotary reversing-

valve at the junction of said ports, the said valve being located between a steam-inlet port and an exhaust-port and controlling the inlet and the exhaust, substantially as shown and described.

2. A rotary engine comprising conical cylinders opening longitudinally into each other, and pistons arranged angularly to one another and mounted to turn in unison within the said cylinders, the shafts of the said pistons extending from each of the cylinder-heads, the said pistons being formed in their peripheries with spiral piston-heads running in opposite directions with one piston-head fitting into the spiral groove formed by the piston-head of the other piston, the said piston-heads having a broad contact-surface for the casing and the spiral groove being of long pitch whereby the use of extra gearing for connecting the pistons is avoided, steam-chests at the ends of the cylinders into which open the ends of the spiral grooves of the pistons, the said steam-chests being provided with ports, and means for controlling the steam to and from the chests, the said piston-heads gradually increasing in diameter from one steam-chest to the other, and the construction permitting the pistons to be moved toward the small end of the cylinder for the purpose of taking up wear, substantially as described.

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Witnesses:

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