L. BRUN.

ROTARY MOTOR.

APPLICATION FILED AUG. 1, 1911.

1,048,391. Patented Dec. 24, 1912.

2 SHEETS—SHEET 1.

Fig. 2.

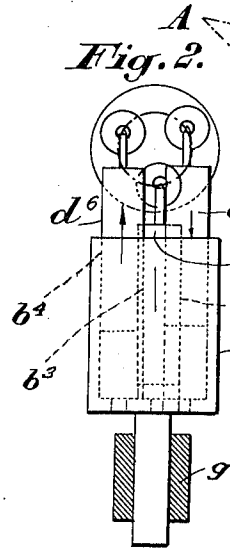


Fig. 1.

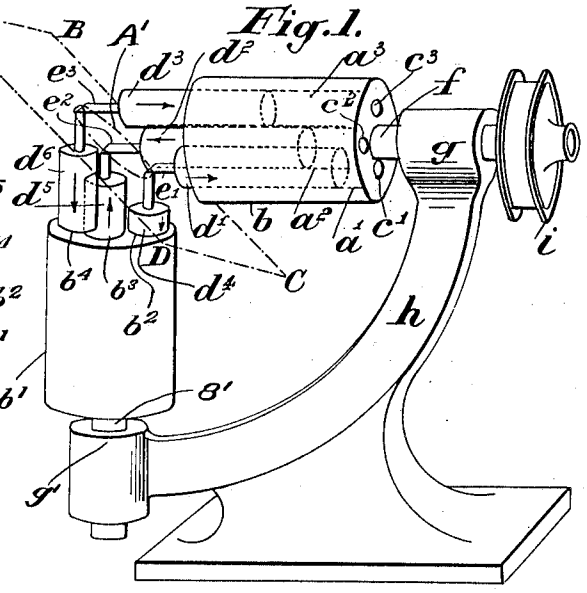


Fig. 3.

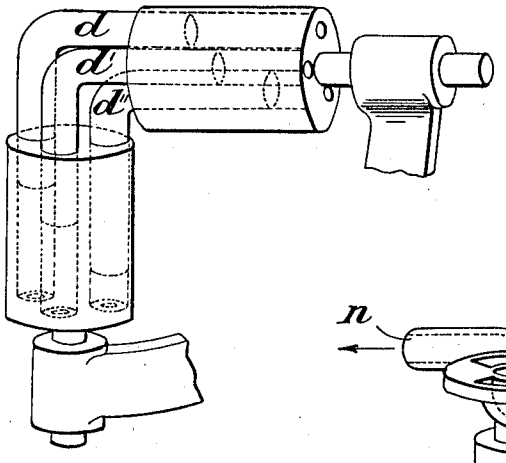
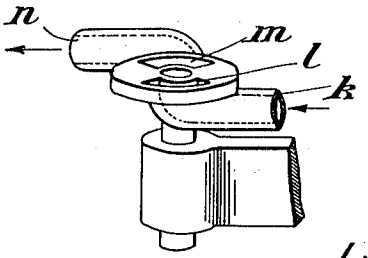


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

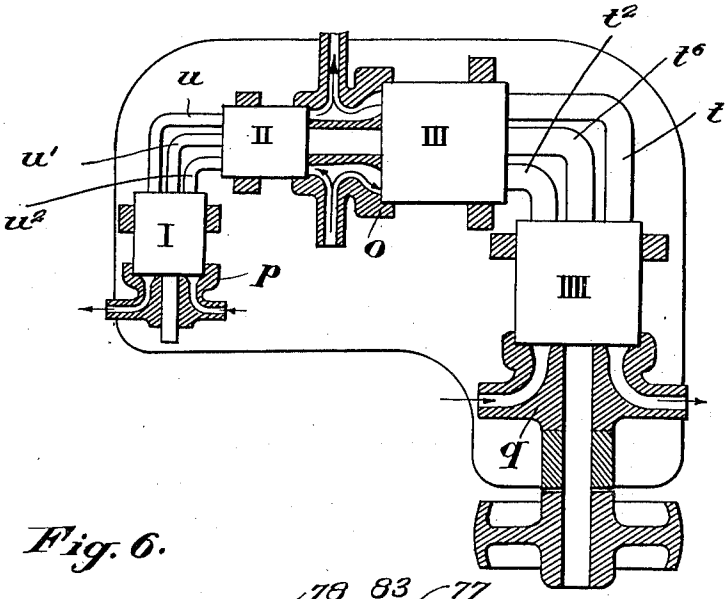
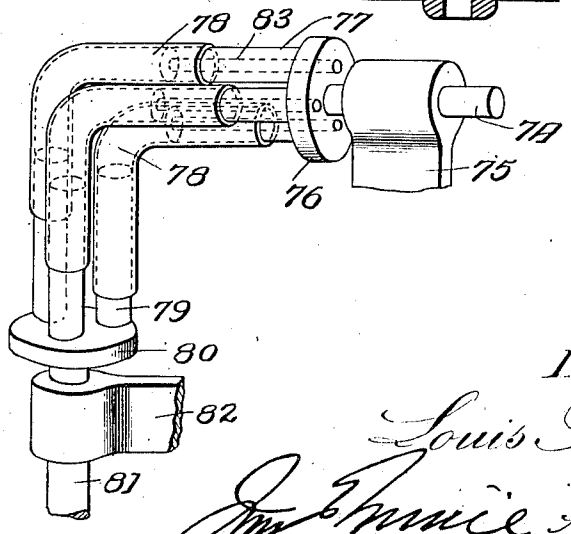


Fig. 6.



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ROTARY MOTOR.

1,048,391. Specification of Letters Patent. Patented Dec. 24, 1912.

Application filed August 1, 1911. Serial No. 641,842.

To all whom it may concern:

Be it known that I, LOUIS BRUN, a citizen of the French Republic, and resident of St. Chamond, France, have invented certain new and useful Improvements in and Relating to Rotary Motors, of which the following is a specification.

This invention relates to an improved rotary motor.

The object of the invention is to provide a rotating cylindrical element, in which operate a series of pistons, connected to similar pistons operating in a similar cylindrical element disposed at an angle to the aforesaid cylindrical element, whereby the reciprocating movement is converted into rotary motion.

The invention also relates to the specific details of construction and arrangement of parts which will be hereinafter described and particularly pointed out in the claims.

In the drawings:—Figure 1 is a diagrammatic perspective view of my improved motor. Fig. 2 is an end view of the same. Fig. 3 is a view similar to Fig. 1 but illustrating each angularly disposed piston for the two cylinders formed integral. Fig. 4 is a detail perspective view of a valve used in connection with my invention. Fig. 5 is a horizontal section of a somewhat different form of the invention. Fig. 6 is a view similar to Fig. 1, illustrating a further modification.

Referring particularly to Figs. 1 and 2, h indicates a casting provided with a horizontal bearing g and a vertical bearing g'. Mounted in the bearing g is a shaft f on the outer end of which is mounted a pulley i and at its opposite end is a cylindrical element b formed with a series of horizontal bores a', a^2, and a^3 parallel with the longitudinal axis of the shaft and with which communicate ports c', c^2 and c^3 respectively. Mounted to reciprocate in the bores are pistons d', d^2 and d^3, formed with stems e', e^2 and e^3, the stems being shown to illustrate the operation of the invention, but in practice, each piston is of angular formation and its ends engage in the bores of two elements, as will be described later on.

Mounted on the shaft f between the outer end of the cylindrical element and the bearing g is a valve casing, indicated in Fig. 4. This casing is formed with a semi-circular inlet passage l on one side of the center of the shaft and with which communicates an inlet pipe k. The valve casing is also provided on the opposite side of the center of the shaft f, with a semi-circular passage m which communicates with an exhaust pipe n. The passages l, and m, coöperate with the ports c', c^2 and c^3 so that as the cylindrical element is rotated as will be presently described, the motive fluid employed to operate the motor will pass through the passage l, and the ports and will exhaust through said ports and the passage m. Three pistons are shown in the drawings, but obviously any number may be employed. These pistons are arranged in circular relation in the cylindrical element as shown in Fig. 2.

Mounted in the bearing g' is a vertical shaft f' provided with a cylindrical element f' provided with a cylindrical element b' formed with three bores b^2, b^3, and b^4, in which operate vertical pistons d^4, d^5 and d^6, each provided with a stem for the purpose previously described. The stems of the vertical pistons are located to be in registry with the stems e', e^2 and e^3 of the cylindrical element b.

To illustrate the movement of the respective pistons I have shown in perspective view an inclined plane indicated at A, B, C and D, disposed at an angle of about 45°. Let it be supposed that the piston e' is forced within its bore by the inclined plane, exhausting the fluid through port m. Fluid from the passage l, enters the port c' and drives it out against the inclined plane, hence causing the cylindrical element b to rotate, the end of the stem e' traveling in an elliptical path indicated conventionally at A' in Fig. 1. The stems e^2 and e^3 follow the same elliptical path, the fluid successively forcing the pistons out, and the inclined plane causing said pistons to rotate the cylindrical element and when the fluid is cut off by the valve the ports will communicate with the exhaust passage and the incline plane will force them back in the bores. Now, let it be assumed that the stem of the piston d^4, moves in unison with the stem e' obviously it would follow the same elliptical path A' and consequently rotate the cylindrical element b', a valve casing similar to that shown in Fig. 4, being mounted on the shaft f' adjacent the bearing g'. By this arrangement of parts the reciprocating movement of the pistons is converted into a rotary motion, without employing in-

termediate mechanism or separate valve operated mechanism.

The inclined plane indicated by A, B, C and D and the separated horizontal and vertical pistons are described merely for the purpose of assisting in gaining an understanding of the movement of the parts and it will be understood this is solely illustrative.

Referring to Fig. 3 it will be observed that the pistons, indicated at d, d' and d^2 are common to both cylindrical elements which is in fact the manner in which the parts will be constructed, for as before stated the inclined plane between the stems of the piston is for the purpose of illustrating the movement. The pistons d, d' and d^2 are bent to provide horizontal and vertical heads which fit in the bores of the two cylindrical elements. Obviously when the motive fluid simultaneously acts on the respective heads of any one of the angular shape pistons and forces the same from the cylindrical elements, it will rotate both cylindrical elements. The fluid in the bores of the horizontal cylindrical element acting on the piston rotates the vertical cylindrical element b', while the fluid in the bores of the vertical cylindrical element acting on the opposite heads will simultaneously rotate the horizontal cylindrical element b. By this means simultaneously rotary motion is imparted to both cylindrical elements, the relative angular location of the cylindrical elements, the circular disposition of the pistons in each element, serving to insure of the reciprocating movement of all the pistons being the same.

The motors may be coupled together to obtain greater power as shown in Fig. 5. In this figure the cylindrical elements are designated I, II, III and IIII. The angular pistons t, t' and t^2 coöperate with the cylindrical elements III and IIII, while the angular pistons, u, u' and u^2, coöperate with the cylindrical elements I and II in exactly the manner as that previously described. A valve casing q, having the necessary inlet and outlet passages is arranged adjacent the cylindrical element IIII and a similar casing p, with inlet and outlet passages is arranged adjacent the cylindrical element I. A casing, o, with inlet and outlet passages is interposed between the cylindrical elements II and III, whereby to admit and exhaust the fluid. The operation of this form of the invention is exactly the same as that before described, but of course greater power is generated.

In the embodiment of the invention shown in Fig. 6, disks 76—80 formed with stems 77—79, having openings 83, are substituted for the cylindrical elements. Fitting on the stems are sleeves 78, which are moved by the fluid entering the openings 83. Obviously when the sleeves are subjected to the pressure of the fluid, the disks 76 and 80 and their stems, 77, 79 will be rotated, hence the shafts 74 and 81 will also rotate. The shafts are mounted in bearings 74, and 82, formed in a casting 75.

What I claim is:

1. A motor comprising a horizontal driven element formed with openings which extend entirely through said driven element, a horizontal shaft on which said driven element is mounted, a vertically disposed driven element formed with openings which extend entirely through the said vertically disposed driven element, a vertical shaft on which the vertically disposed element is mounted, rigid angularly disposed driving elements registering with corresponding openings in the horizontal and vertically disposed driven elements, a valve casing mounted on the horizontal shaft and bearing against the end of the horizontal driven element, said valve casing having inlet and outlet ports with which the openings in the horizontal driven element are adapted to register, a valve casing mounted on the vertical shaft and bearing against the end of the vertically disposed driven element, said latter valve casing having inlet and outlet ports with which the opening in the vertically disposed driven element is adapted to register, whereby when motive fluid is passed through the inlet ports in the casings the driving elements will be reciprocated and the horizontal and vertically disposed driven elements will be rotated.

2. A motor comprising a horizontal driven element provided with a plurality of stems, each of which is formed with an opening, a vertically disposed driven element provided with a plurality of stems, each of which is formed with an opening, a plurality of angular shape driving elements each of which is open at its ends, said open ends fitting over the stems of the driven elements, and means for admitting motive fluid to the openings to reciprocate the driving elements and to rotate the driven elements.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

LOUIS BRUN.

Witnesses:
E. Irénée Brun,
Jno. N. Broune.