

(No Model.)

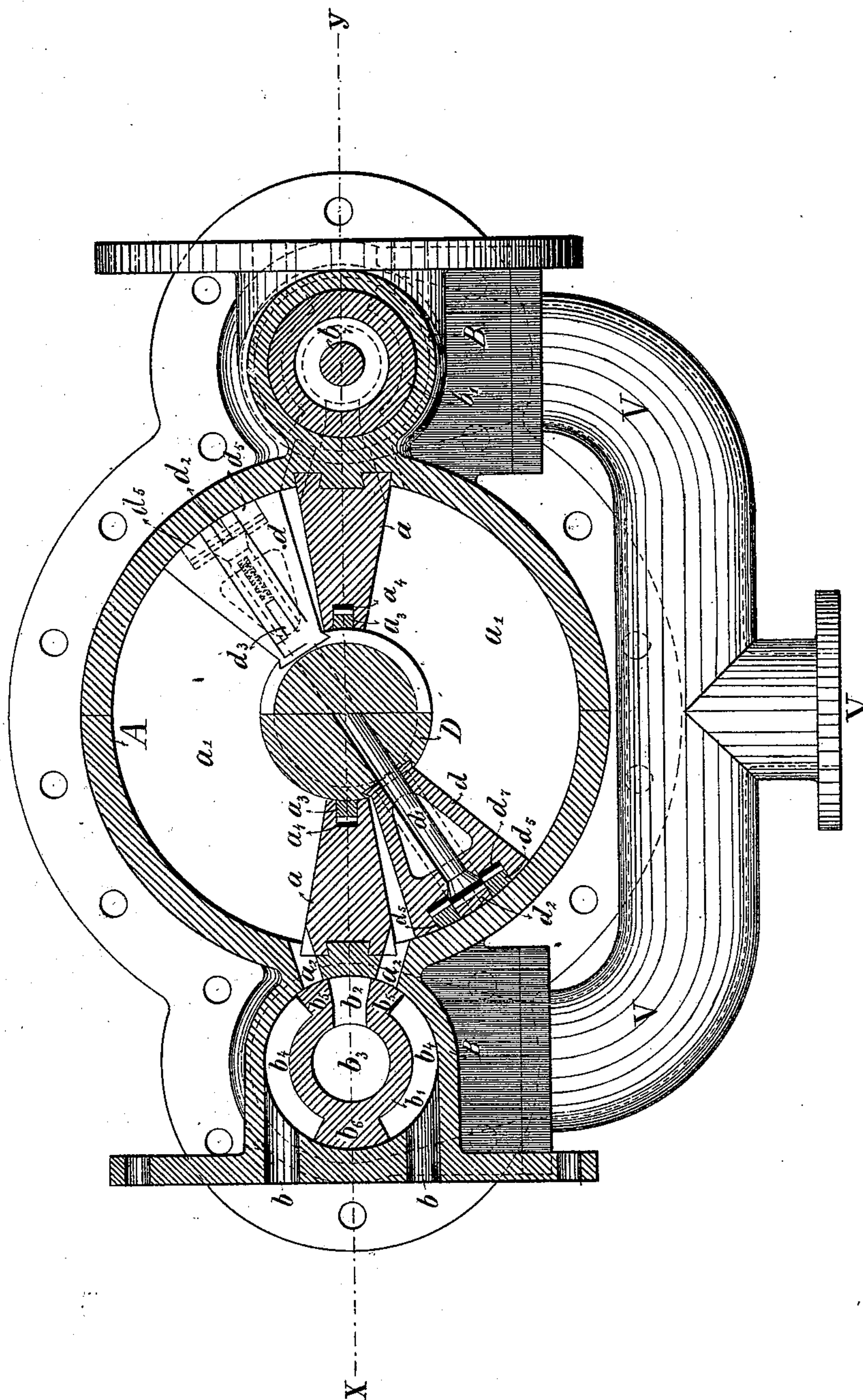
3 Sheets—Sheet 1.

C. F. WENNBURG.
STEAM OR OTHER FLUID PRESSURE ENGINE.

No. 514,295.

Patented Feb. 6, 1894.

Fig. 1.



Witnesses:

W. Sedgwick

J. M. Ritter

Inventor:

C. F. Wennberg

per

Munn & Co

Attorneys

(No Model.)

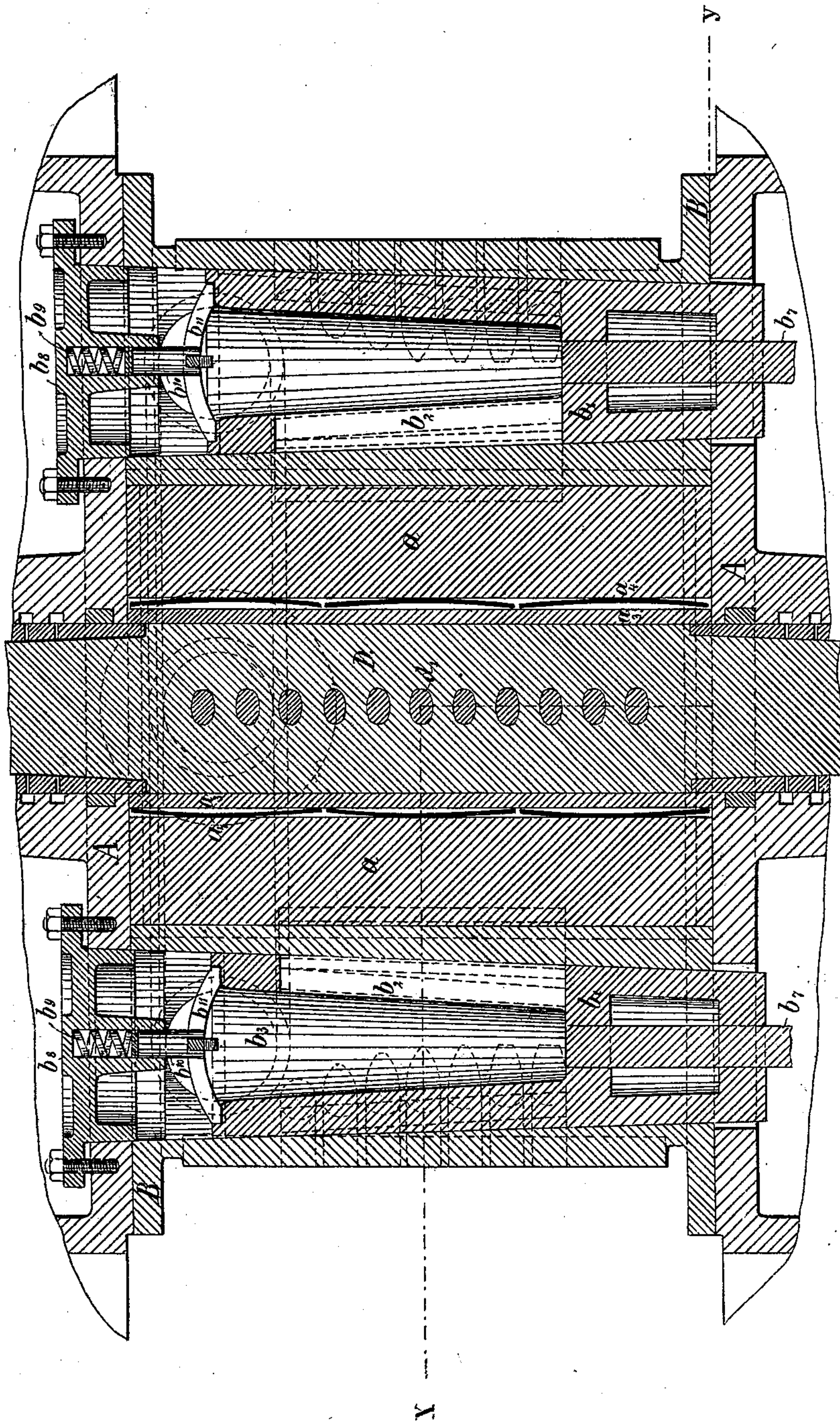
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Fig. 2.



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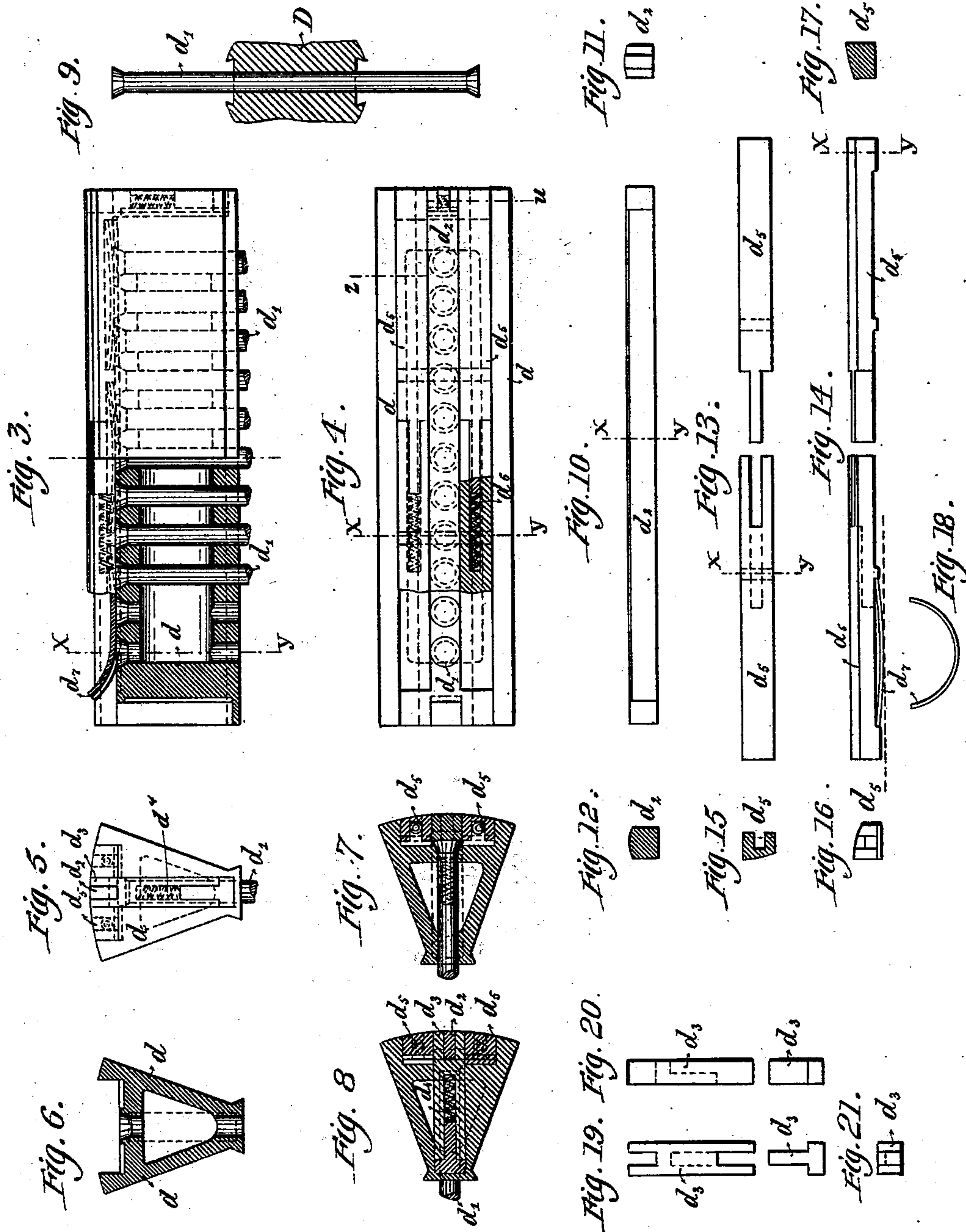
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UNITED STATES PATENT OFFICE.

CARL FREDRIK WENNBERG, OF JÖNKÖPING, SWEDEN.

STEAM OR OTHER FLUID PRESSURE ENGINE.

SPECIFICATION forming part of Letters Patent No. 514,295, dated February 6, 1894.

Application filed October 30, 1889. Serial No. 328,721. (No model.) Patented in Norway May 31, 1889, No. 1,359; in Sweden June 1, 1889, No. 3,356; in France June 13, 1889, No. 198,911; in Germany June 20, 1889, No. 52,131; in Belgium June 20, 1889, No. 86,712; in England June 25, 1889, No. 10,351; in Finland July 11, 1889, No. 341; in Switzerland August 2, 1889, No. 1,571; in Luxemburg August 8, 1889, No. 1,164; in Spain August 23, 1889, No. 9,772; in Italy September 30, 1889, No. 26,021; in Russia September 30, 1889, No. 11,086; in Austria-Hungary November 30, 1889, No. 42,011 and No. 34,305; in Denmark February 3, 1891, No. 303, and in Portugal May 23, 1891, No. 1,575.

To all whom it may concern:

Be it known that I, CARL FREDRIK WENNBERG, a subject of the King of Sweden and Norway, and a resident of Jönköping, Sweden, have invented a new and useful Improvement in Steam or other Fluid Pressure Engines, of which the following is a specification.

Foreign patents have been granted for this invention, as follows: in Norway, No. 1,359, dated May 31, 1889; in Sweden, No. 3,356, dated June 1, 1889; in Denmark, No. 303, dated February 3, 1891; in Germany, No. 52,131, dated June 20, 1889; in England, No. 10,351, dated June 25, 1889; in France, No. 198,911, dated June 13, 1889; in Belgium, No. 86,712, dated June 20, 1889; in Italy, No. 26,021, dated September 30, 1889; in Spain, No. 9,772, dated August 23, 1889; in Russia, No. 11,086, dated September 30, 1889; in Finland, No. 341, dated July 11, 1889; in Portugal, No. 1,575, dated May 23, 1891; in Switzerland, No. 1,571, dated August 2, 1889; in Luxemburg, No. 1,164, dated August 8, 1889, and in Austria-Hungary, No. 42,011 and No. 34,305, dated November 30, 1889.

This invention relates to a partially rotary steam or other fluid pressure engine, and consists of the construction and combination hereinafter described and claimed.

In order to enable my invention to be fully understood I will proceed to describe how it can be carried into practice by reference to the accompanying drawings in which—

Figure 1 is a vertical section on the line $x-y$, Fig. 2. Fig. 2 is a horizontal sectional view of the same, the section being taken through the line $x-y$, Fig. 1. Fig. 3 is a front elevation, partly in section, of the wing or piston of the cylinder. Fig. 4 is a plan partly in section. Fig. 5 is an end view of the same. Fig. 6 is a section through the line $x-y$ Fig. 3. Fig. 7 is a section through the line $x-y$, Fig. 4. Fig. 8 is a section through the line $z-u$, Fig. 4. Fig. 9 is a sectional view of part of the cylinder shaft with a fastening bolt for the wings. Fig. 10 is a side-view of the central strip of packing for the outer surface of the wings. Fig. 11 is an end view of the same.

Fig. 12 is a section of the same through the line $x-y$, Fig. 10. Fig. 13 is a plan of one of the two outer strips of packing for the wings. Fig. 14 is a side view of the same. Fig. 15 is a section of the same through the line $x-y$, Fig. 13. Fig. 16 is an end view of the same. Fig. 17 is a section of the same through the line $x-y$, Fig. 14. Fig. 18 is a view of the packing spring shown in Fig. 3. Fig. 19 is a front view of the side packing strip for the wings. Fig. 20 is a side view; and Fig. 21 is a plan of the same.

The steam cylinder A may be of cylindrical, conical or other suitable shape. It is shown of a cylindrical shape in the drawings and is divided into two chambers a' , by partitions a , which chambers by means of steam ports a^2 , one on each side of the partition wall, are in communication with the steam chest B. The cylinder shaft D is placed in the center of the cylinder and works in the usual way in stuffing boxes in the cylinder covers and in the partitions provided with packing pieces a^3 and springs a^4 ; the wings d are dovetailed into the periphery of the said cylinder shaft and held together by diametrically placed bolts d' . The details of the wings are shown in Figs. 2 to 21. They each consist of a triangular shaped hollow casting which both on the upper surface and on the sides is provided with grooves for the reception of packing. The outer surface has three strips of packing, the middle one d^2 being at both ends provided with a rectangular projection, which fits into a corresponding recess in the upper end of the piece of packing d^3 at the ends of the wings, the pieces of packing d^3 are in two parts which are caused to expand longitudinally by means of a spiral spring d^4 . The remaining two strips of packing d^5 on the outer surface of the wings and located one on each side of the strip d^2 are both in two parts and made to expand like the pieces on the end of the wings by means of coiled springs d^6 , all the pieces of packing both at the outer surface and end being provided with springs d^7 . The steam chest B which through the steam ports a^2 communicates with the chamber of

the cylinder, is bored conical and provided with a corresponding slide or plug which is hollow as best shown in Fig. 1, and open on a part of its conical surface as at its largest end, 5 these openings b^2 and b^3 respectively serving as an outlet for the exhaust steam. The distributing slide b' is provided with two cavities b^4 producing the sliding and closing surfaces b^5 and b^6 ; b^5 is for closing the steam 10 ports a^2 to the cylinder and b^6 is for covering the steam inlet passages b . The passages b may be two or more in number. The distributing slide is kept tight in the valve chest by the pressure of a spring b^9 , placed in the 15 valve chest head b^8 , the spring b^9 acting on the slide through a pin b^{10} and a cross piece b^{11} . The supply of steam admitted into the chest B of the distributing slide through the passages b ; from the chest B the steam is, by 20 the movement of the distributing slide b' , alternately let into the chambers a' of the cylinder above and below the partition wall a through the ports a^2 and at the same time the exhaust steam is, by the movement of the 25 same slide, alternately let into the exhaust pipe V through the ports a^2 , the side openings b^2 and the bottom openings b^3 of the said slide.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, 30 I declare that what I claim is—

In a steam or other fluid motor, a cylindrical or other circular shaped chamber formed with partitions and a rock shaft centrally thereof, the partitions and shaft dividing the 35 chamber into compartments, and wings or abutments fixed to the shaft, having end packing strips and packing strips fitted in their outer or peripheral faces, the central one of the peripheral packing strips having rectangular 40 projections engaging the end strips, and being spring pressed radially, and the packing strips at the sides of such central strip being divided and the members spring pressed longitudinally, substantially as described. 45

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 21st day of August, 1889.

CARL FREDRIK WENNERBERG.

Witnesses:

C. WEUERMARK,
C. J. GULLBRAND.