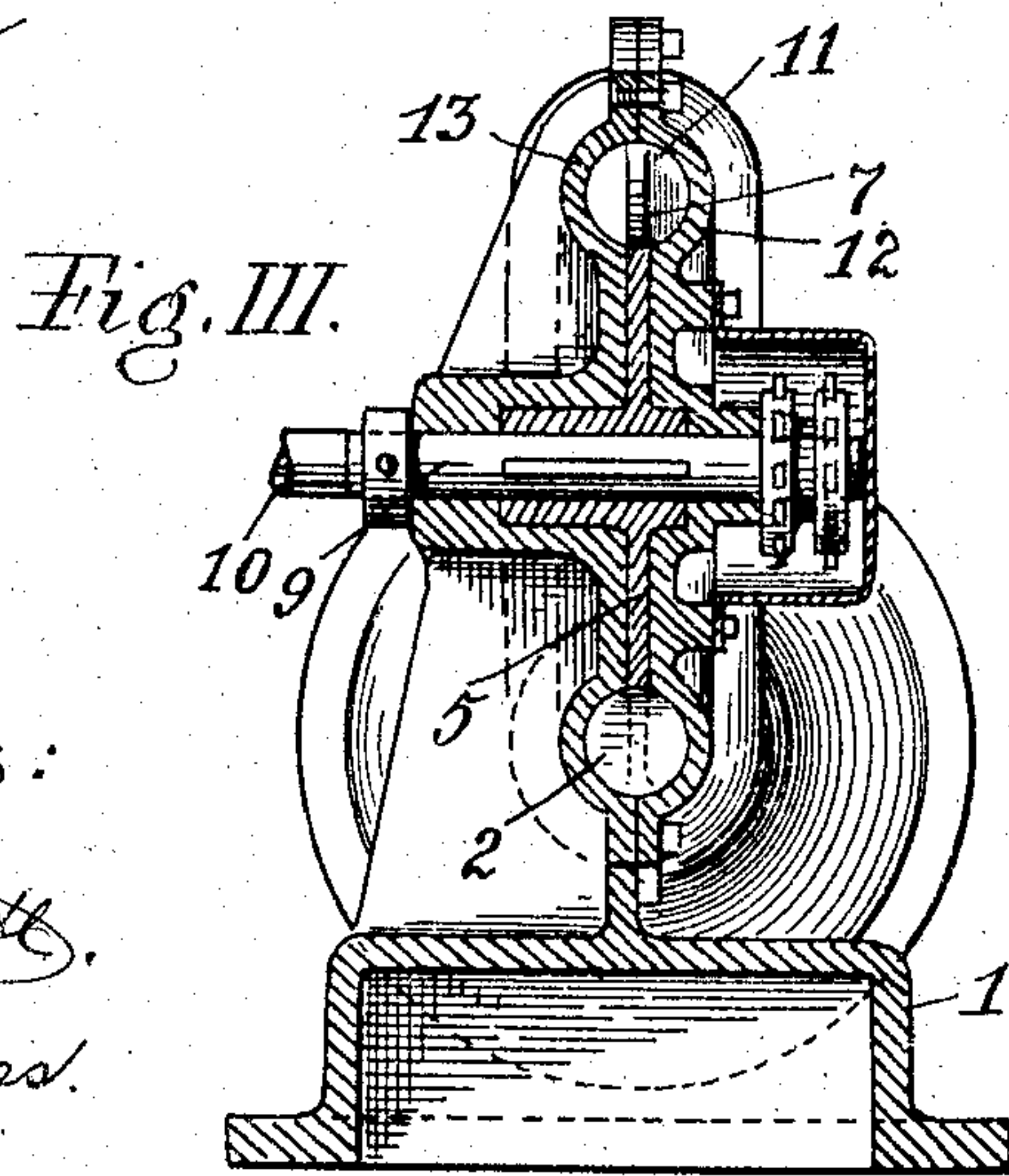
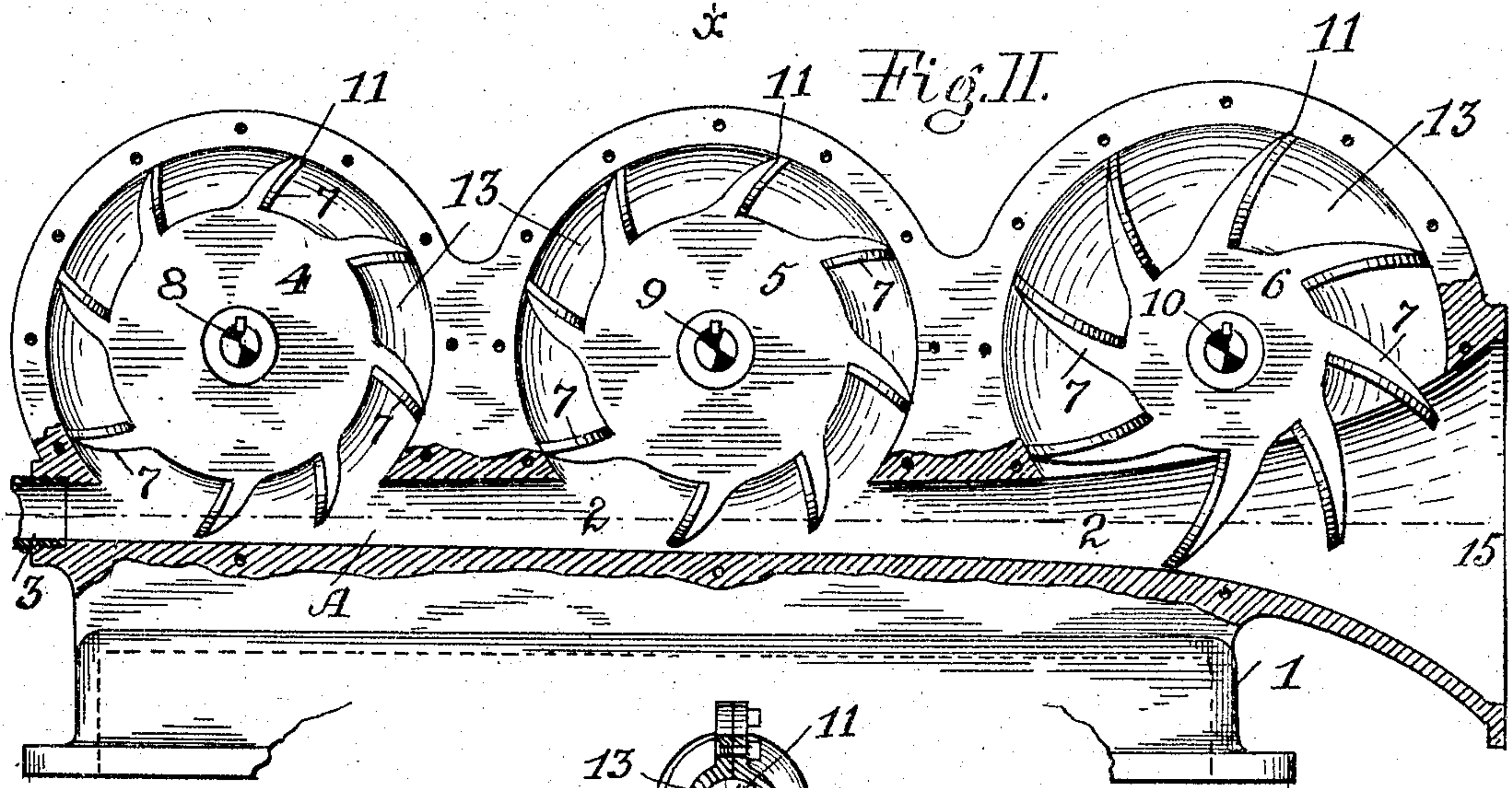
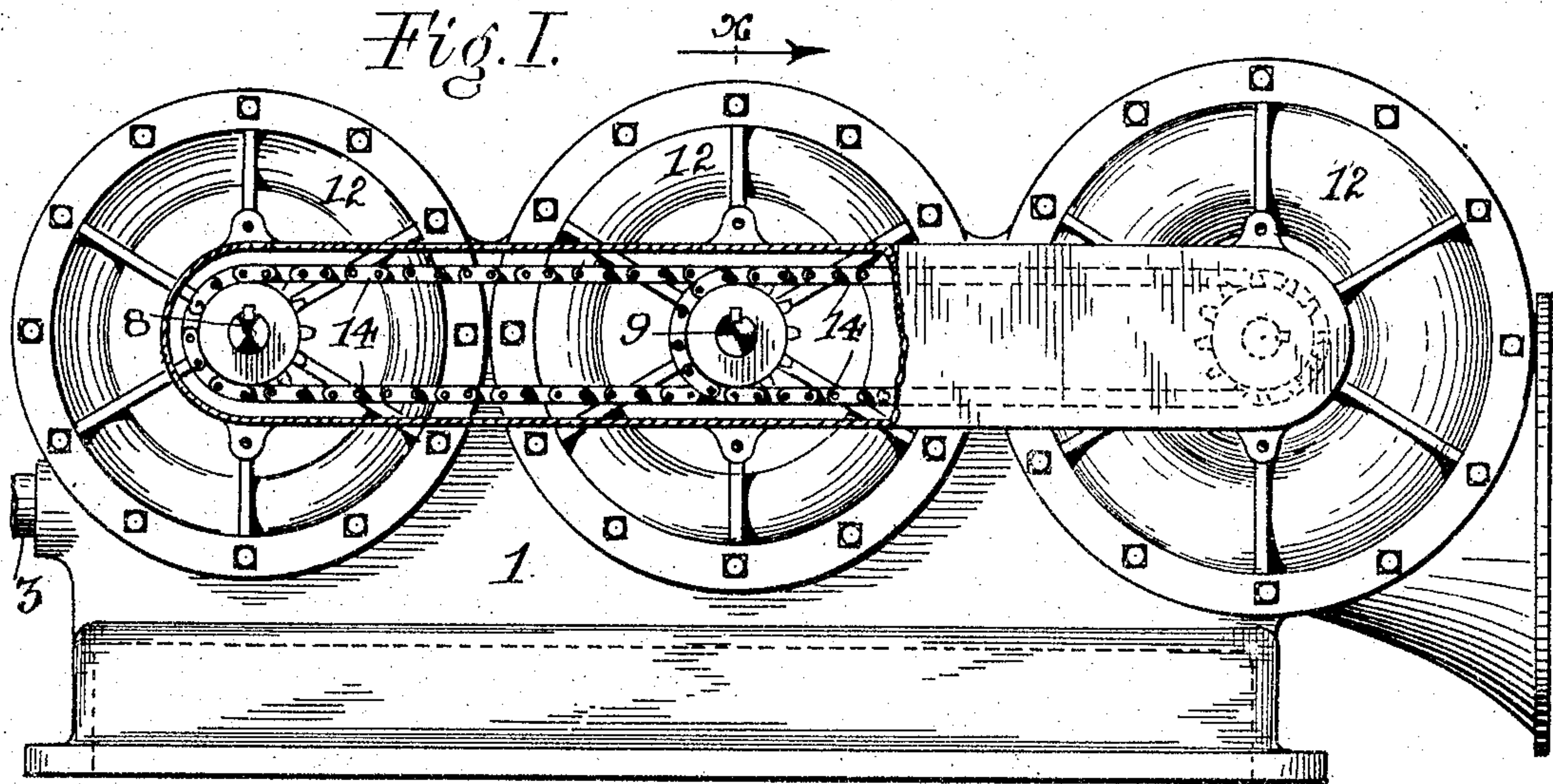


No. 790,019.

PATENTED MAY 16, 1905.

G. A. ALDRICH.
ELASTIC FLUID MOTOR.
APPLICATION FILED MAR. 7, 1905.



Witnesses:

H. Monteverde,
Elmer Wickes.

Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE A. ALDRICH, OF SAN FRANCISCO, CALIFORNIA.

ELASTIC-FLUID MOTOR.

SPECIFICATION forming part of Letters Patent No. 790,019, dated May 16, 1905.

Application filed March 7, 1905. Serial No. 248,902.

To all whom it may concern:

Be it known that I, GEORGE A. ALDRICH, a citizen of the United States of America, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Elastic-Fluid Motors; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to rotative motive engines driven by the impulsion of elastic fluids.

My improvement consists in a peculiar form of nozzles containing a series of motive wheels having vanes that intercept and receive the impulsive force of an elastic fluid flowing in said nozzle or conduit, the sectional area of which increases with the fall of temperature and velocity of this fluid and corresponding as nearly as possible to the expansion of various elastic fluids, such as air, steam, or gas evolved from the combustion of hydrocarbon fuels.

The object of my invention is to utilize the energy of elastic fluids under pressure by simple rotative apparatus free from metallic contacts and wearing-surfaces and in stages until the flow has practically ceased and the kinetic energy has been transferred to the motive apparatus. To the attainment of these ends I provide apparatus, as illustrated in the drawings herewith and forming a part of this specification.

Figure I is a side view of a complete engine constructed according to my invention; Fig. II, a central transverse section through the same engine, showing the motive wheels and conduit for the impelling fluid; and Fig. III, a section on the line *x x* in Fig. I.

The main frame 1 is preferably as shown in Fig. III, and in this frame there is an integrally-formed passage 2, extending there-through, having a bore or sectional area formed as indicated in Fig. II. An inlet-nozzle 3 delivers elastic fluid—such as air, steam, or the gases of combustion of hydrocarbons—which fluid traverses the passage or conduit at a

pressure and velocity according to its temperature and increase of volume, the contour of the longitudinal section of said passage being formed of hyperbolic curves, the diverging dimensions of the passage or nozzle 2 corresponding to expansion in the ordinary piston steam-engines, graphically described by a hyperbolic curve. Along this passage 2 I place a series of motive wheels, which may be of any number, three being shown in the present drawings, each wheel being provided with arms or vanes 7, the form of which represent a cross-section of the passage 2, which the vanes 11 intersect from the beginning to the end at 15. These arms or vanes 7 are made acute in their thin section at the periphery 11 and intercept and receive each in part the impulsive energy of the fluid delivered from the nozzle 3 and traversing the passage 2, which latter is made divergent from the point marked A, bounded by hyperbolic lines that produce an area at any point corresponding approximately to the expanding volume of the fluid. The wheels 4, 5, and 6 are so proportioned that their radii are the same from their own axes to the center of the passage 2, permitting a uniform axial rate of rotation, so their shafts 8, 9, and 10 can be positively connected by chains 14, as shown in Fig. I, or other suitable manner. The vanes 7 have at their periphery circular extensions or plates 11, that fill but pass loosely in the chambers 2 and 13. The energy or work of these wheels is preferably taken off from the shaft 10 of the rear wheel and can be transmitted by a band or other gearing to any useful purpose requiring motive power. The wheels and all interior parts are accessible by removing the side covering-plates 12. This permits finishing or smoothing the surfaces in the passage 2 or other surfaces requiring such treatment. By this construction it will be seen that the radius of each of the wheels 4, 5, and 6 measured from its axis to the center line of the passage is the same and the axes of the wheels are in one plane.

Having thus described the nature and objects of my invention and manner of its applica-

tion, what I claim as new, and desire to secure by Letters Patent, is—

In an elastic-fluid motor, a conduit or passage for the impelling fluid of divergent form
5 bounded in its longitudinal section by hyperbolic lines corresponding approximately to the expanding volume of the fluid; a series of motive wheels provided with vanes that intersect and fit the divergent passage respectively at each successive intersecting point,
10 the radii of said wheels being all equal meas-

ured from the center line of the divergent passage to the respective axes of said wheels, substantially as specified.

In testimony whereof I have signed my name 15 to this specification in the presence of two subscribing witnesses.

GEORGE A. ALDRICH.

Witnesses:

JAMES MASON,

ELMER WICKES.