

(No Model.)

E. D. FARCOT.
Centrifugal Ventilator or Pump.
No. 236,423. Patented Jan. 11, 1881.

Fig. 1

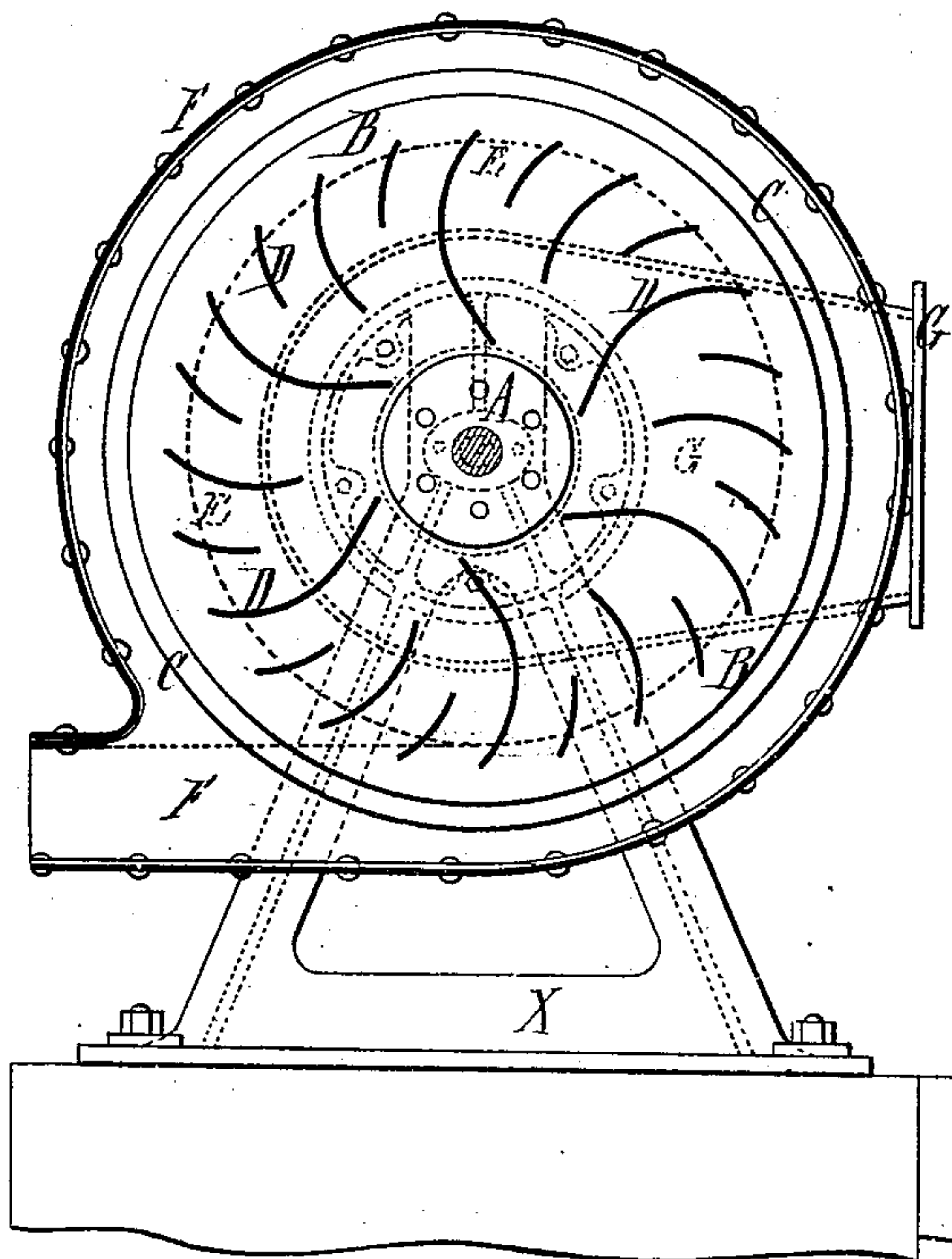


Fig. 2.

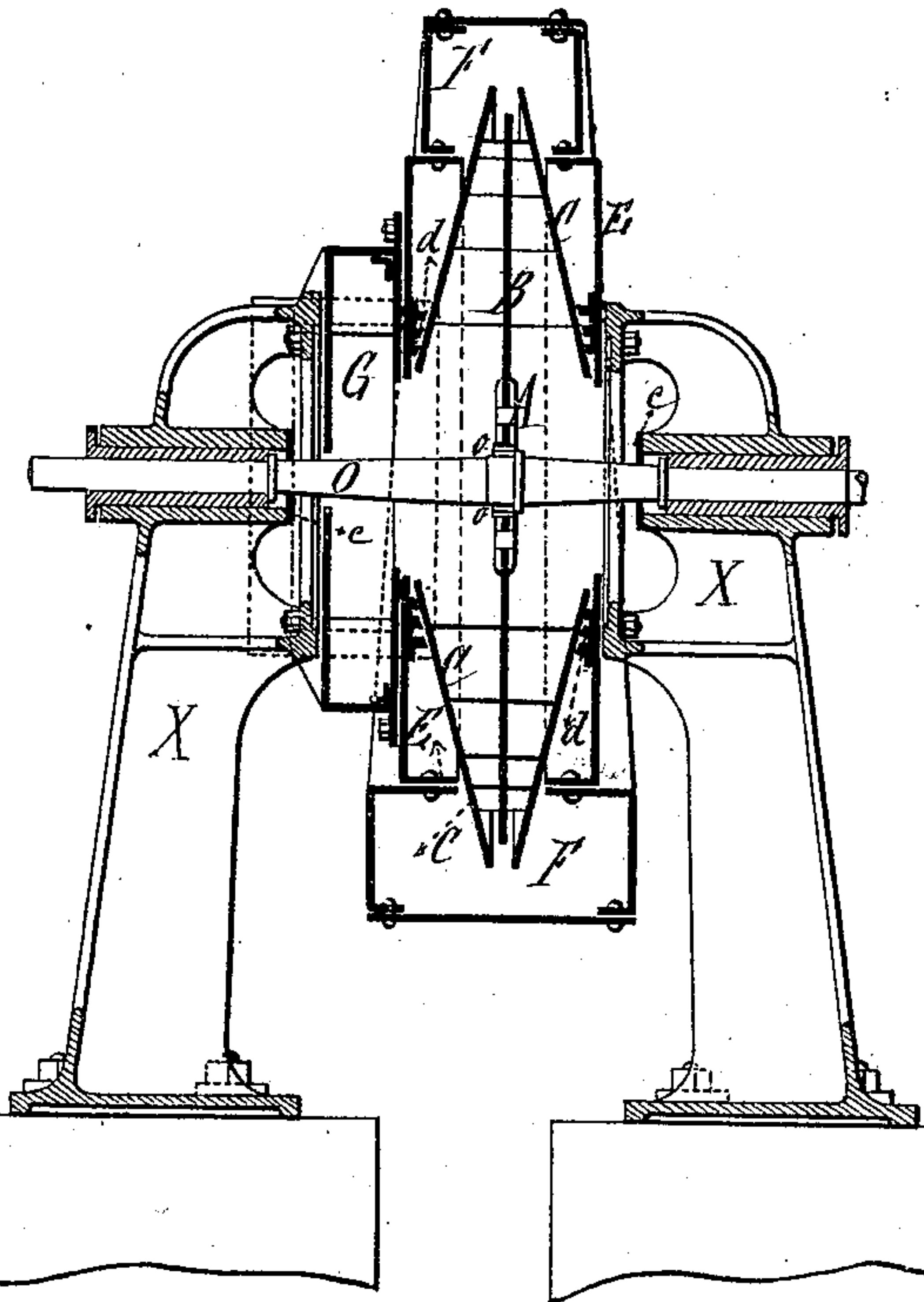
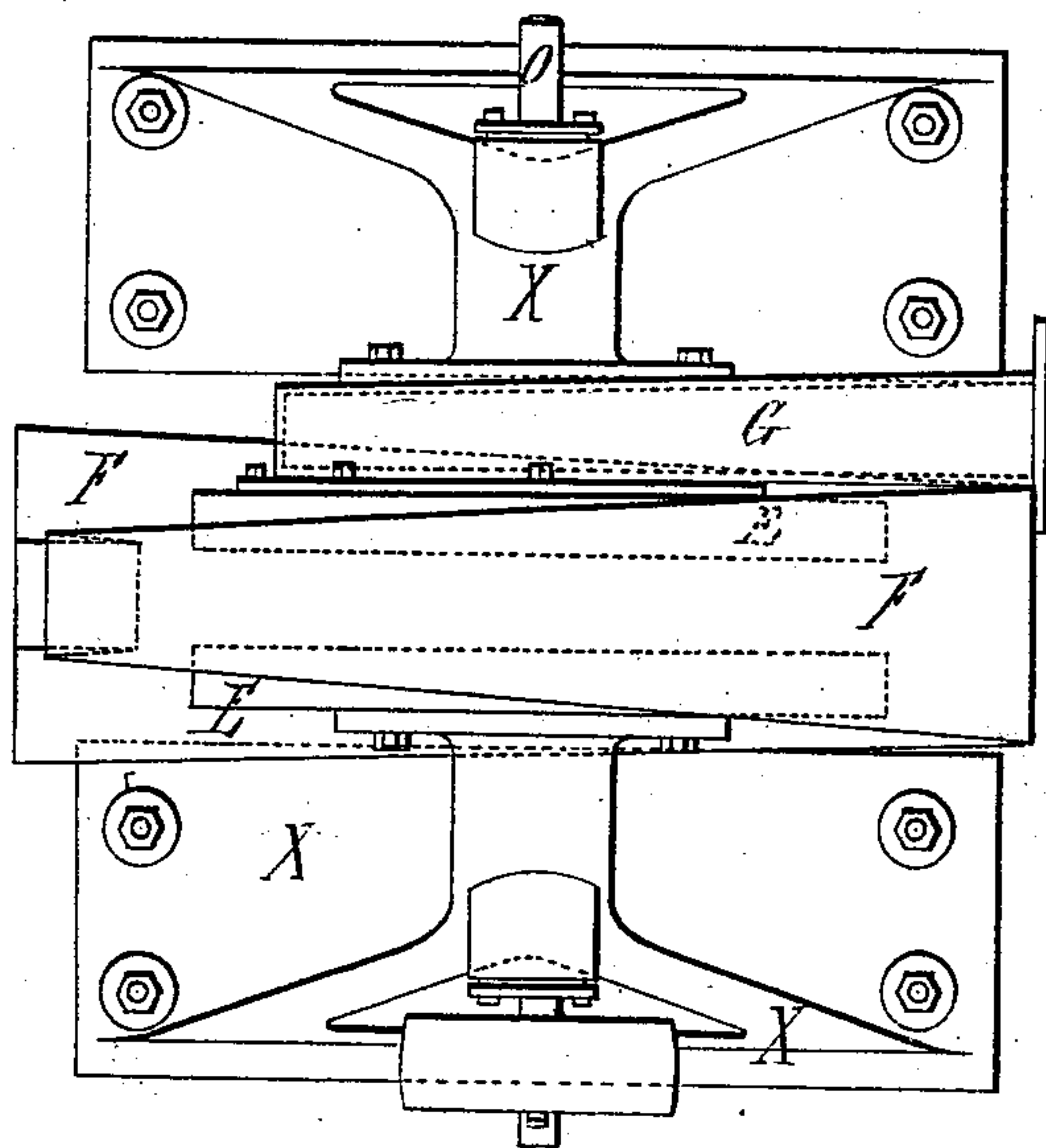


Fig. 3.



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Philippauro } witnesses.

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by
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UNITED STATES PATENT OFFICE.

EMMANUEL D. FARCOT, OF PARIS, FRANCE.

CENTRIFUGAL VENTILATOR OR PUMP.

SPECIFICATION forming part of Letters Patent No. 236,423, dated January 11, 1881.

Application filed May 13, 1880. (No model.) Patented in France May 29, 1878.

To all whom it may concern:

Be it known that I, EMMANUEL DENIS FARCOT, of Paris, France, have invented a new and useful Improvement in Centrifugal Ventilators or Pumps, which invention is fully described in the following specification.

This invention relates to centrifugal apparatus, ventilators, or pumps serving to propel or impart motion to fluids, and its object is, in general, to improve the construction and operation of such apparatus.

It consists, mainly, in the following points:

First, around the whole periphery of the revolving floats, paddles, or fans is left a free space, which forms a regulator for the fluid—air or water, for example. This space is comprised between the ends of the paddles or fans and the circumference of the side plates which extend beyond the outer ends of said fans or floats. In this way eddies and other causes of disturbance are avoided, and the effective operation of the apparatus is consequently increased.

Second, the side plates of the rotary part of the apparatus are conical, and at their circumference converge toward each other. In consequence of this convergence, the intervening space becoming less and less, the current of fluid is subjected to an increasing and regular contraction. This convergence of the side plates extends to the actual circumference, so that the regulating-space above mentioned has itself a section decreasing toward the circumference, which decrease has the effect of advancing the pressure successively and progressively, without eddying or agitation of the fluid, until it attains the maximum at the circumference of the plates. The pressure is the same in two successive passages or branches of the fluid-regulator—that is, before and behind a float or fan—whereas with ordinary ventilators there is an excess of pressure ahead of a fan or paddle, and a diminution in the rear thereof. My disposition of the conical fluid-regulator results in notably diminishing this difference in pressure, and consequently diminishes largely the irregular movement of the fluid and loss of motive power.

Third, another peculiarity is the form of the chamber or trunk surrounding the wheel and comprised between the circumference

thereof and the outer casing. The most useful effect is obtained when the velocity of the fluid in this chamber is equal to the velocity of the revolving wheel at the circumference of the fluid-regulator. This is the normal condition, and when it is obtained the fluid passes from between the fans or floats without disturbance or loss of motive power. In accordance with this rule, the precise condition will be changed in one direction or the other, according to the special use of the apparatus. If it is to serve as an aspirator, it will be advantageous to make the inclosing chamber or trunk somewhat large, for otherwise, owing to the velocity's tending to be reduced in said chamber, there would be a partial vacuum in the wheel. For a blower the section of the inclosing chamber or trunk should be slightly reduced in section to accomplish the opposite effect. In this way a ventilator can be readily constructed, capable of effecting aspiration or forcing under the most favorable conditions by simply changing in section the chamber exterior to and surrounding the fluid-regulator. Thus, the apparatus being arranged to serve as an aspirator, it suffices to dispose in the interior of the chamber a removable lining, which diminishes the section of said chamber and converts the apparatus into a blower.

Finally, the centrifugal apparatus, made in accordance with this system, presents certain constructions, arrangements, and combinations of parts which facilitate the movement and operation under divers conditions, as hereinafter more fully set forth. The invention is equally applicable to both ventilators and centrifugal pumps.

In the accompanying drawings, which form a part of this specification, I have shown a ventilator, which I will now proceed to describe.

Figure 1 is a longitudinal section; Fig. 2, a cross-section, and Fig. 3 a plan.

The same letters indicate like parts on all the figures.

On the shaft O is fixed the hub or boss A, to which the diaphragm B is attached. Between this and the inclined or conical side plates, C, are placed the fans or floats D, of which the curvature is seen in Fig. 1.

Instead of two side plates, as shown, (see

Fig. 2,) one only could be employed when a smaller current of air is wanted, it being placed on the side of and inclined toward the diaphragm. In any case the best results are obtained by placing the ventilator in the middle of the casing E, so that the conical air-regulator, formed between the outer ends of the floats or paddles and the plates C, empties in the middle of the exterior chamber or trunk, F.

The casing E may have a uniform width or thickness, and contain on the inside a chamber increasing successively in width, and consequently in size. By such a construction it is very easy to adapt a ventilator to whatever special purpose may be desired by separating or bringing together the plates which form the sides of the chamber.

In the drawings I have shown the chamber or trunk F formed by the walls of the casing, the sheets of metal, suitably curved, which compose the same being riveted together.

If the ventilator is to be used as an aspirator, a box or aspiration-chamber, G, is secured on one of the faces of the apparatus, and it is attached to the casing of the ventilator and upon the supporting-frame X so as to be readily removed in order to form a blowing or air-forcing apparatus.

Entrance into the apparatus of the oil used for lubricating is prevented by means of diaphragm-plates c, Fig. 2.

The circular or annular projections d are designed to prevent the air from passing between the side plates, C, and the casing. It is the means of making a hermetic joint without causing friction or wear.

The holes o in the hub or boss A permit an equilibrium of pressure upon opposite sides of the diaphragm, and thus lateral pressure is avoided.

The frame or support X sustains the casing, as explained above, and permits the apparatus to be used as a forcing apparatus or as an aspirator.

Ventilators for various purposes—for houses, mines, &c.—can be made in accordance with this invention, and so, also, can centrifugal pumps of various kinds.

The apparatus can be made of various forms and of any suitable material.

The chamber or trunk surrounding the rotary wheel can be rectangular, circular, or of other suitable form in cross-section, and the progressive contraction or expansion can be obtained in the several forms by the construction of the casing itself, or by movable linings or envelopes.

Having thus fully described my said inven-

tion and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. In a centrifugal apparatus, the rotating wheel having the side plates extending beyond the outer ends of the floats or fans, as set forth.

2. A rotary wheel for a centrifugal apparatus, comprising a number of floats or fans, and side plates converging toward the periphery thereof and extending beyond the outer ends of said floats or fans, as set forth.

3. The combination of a revolving wheel, comprising a series of fans or floats and side plates revolving with said fans or floats, and a chamber or trunk surrounding said wheel and having an interior capacity proportioned relatively thereto as indicated, so that the velocity of the fluid therein corresponds with that of the circumference of the wheel, substantially as described.

4. The combination, with the revolving wheel, comprising a number of fans or floats and side plates extending beyond the outer ends of said fans or floats and converging toward the circumference, of the surrounding chamber or trunk, increasing in cross-section toward the outlet, substantially as described.

5. The combination, with a revolving shaft, of a diaphragm, floats, and a side plate or side plates, said diaphragm having the said floats attached thereto on one or both sides and extending to or beyond the outer ends of said floats, substantially as described.

6. The combination of the revolving shaft, diaphragm secured thereto, floats or fans, and conical side plates extending beyond the outer end of said floats or fans, substantially as described.

7. A centrifugal pump, ventilator, or similar apparatus comprising the following elements in combination: a supporting-frame, a shaft turning in bearings thereon, a wheel revolving with said shaft and comprising floats or fans held between side plates, converging toward the circumference, and extending beyond the outer ends of the floats or fans, a casing, and a chamber or trunk surrounding the wheel and formed as indicated, so that the fluid therein will have the same velocity as the periphery of said wheel.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EMMANUEL DENIS FARCOT.

Witnesses:

GEO. H. SCIDMORE,
A. CABYL.