C. WEDEKIND.

CENTRIFUGAL APPARATUS FOR COMPRESSING AND PROPELLING FLUIDS.

APPLICATION FILED AUG. 14, 1906.

951,162.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 1.

FIG. 1.

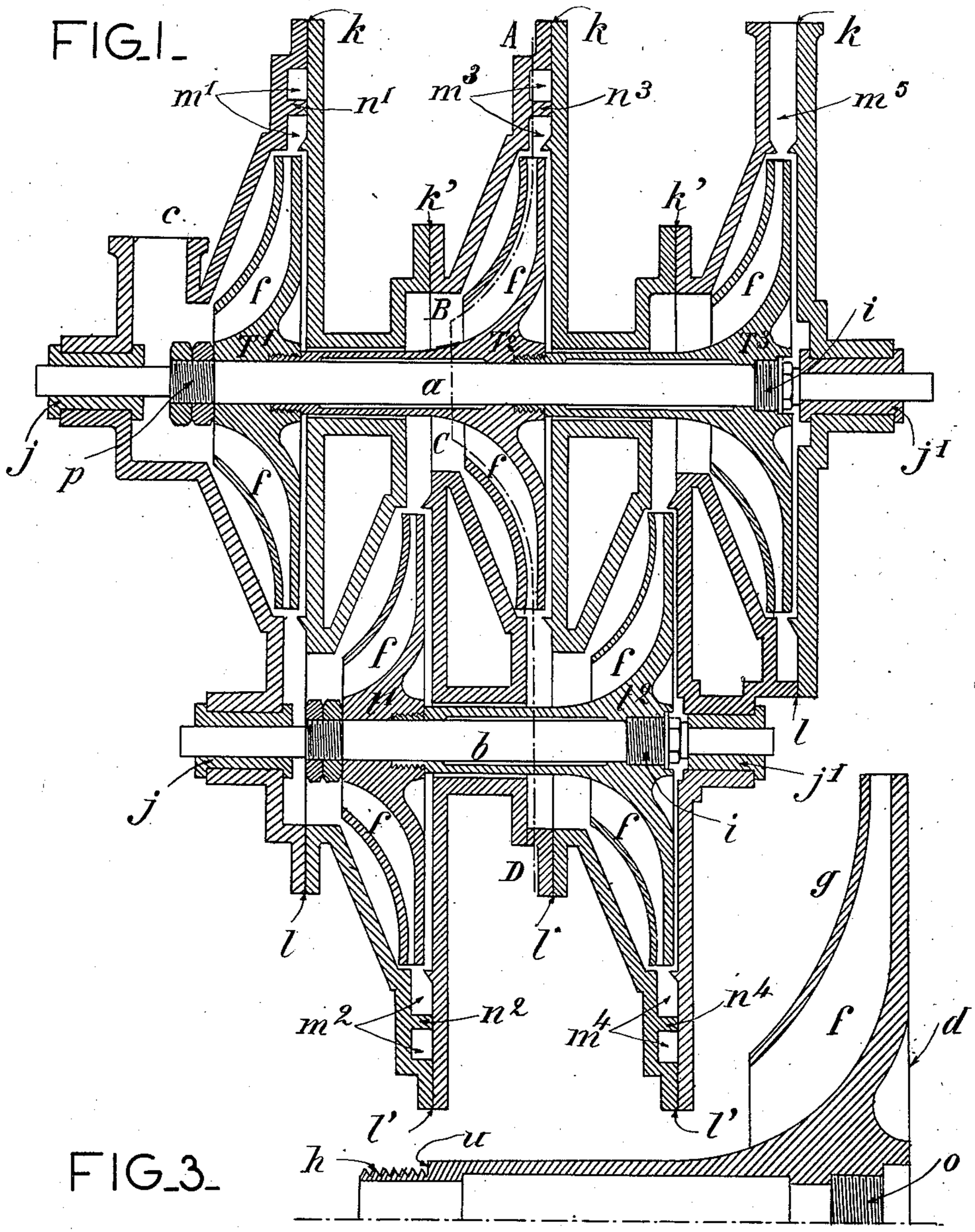

FIG. 3.

WITNESSES

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2 SHEETS—SHEET 2.

FIG. 2.

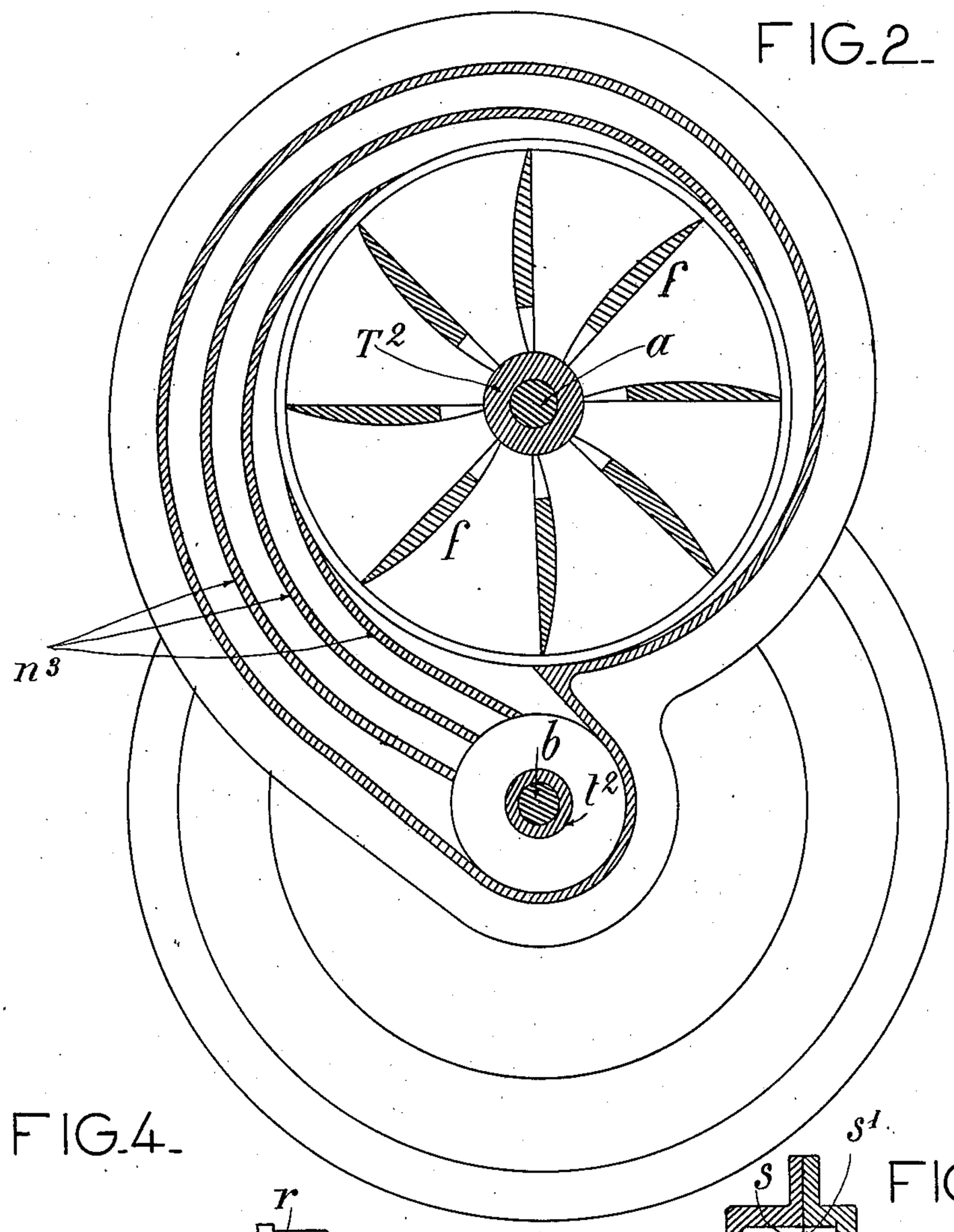


FIG. 4.

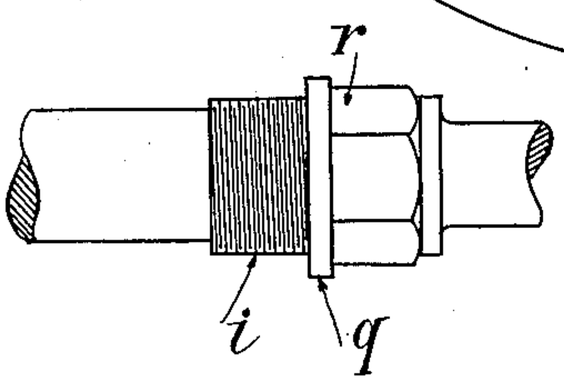
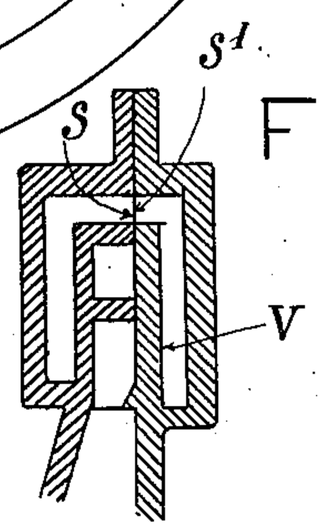


FIG. 5.



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CENTRIFUGAL APPARATUS FOR COMPRESSING AND PROPELLING FLUIDS.

951,162. Specification of Letters Patent. Patented Mar. 8, 1910.

Application filed August 14, 1906. Serial No. 330,572.

To all whom it may concern:

Be it known that I, CARLO WEDEKIND, civil engineer, subject of the Emperor of Germany, residing at St. Jean-sur-Mer, Alpes-Maritimes, in France, have invented new and useful Improvements in Centrifugal Apparatus for Compressing and Propelling Fluids, of which the following is a specification.

This invention relates to an improved centrifugal compressor and propeller and its purpose is to allow of obtaining, by means of a single independent machine, gas-pressure or liquid-pressure of a very much higher value than can be obtained by means of ordinary centrifugal apparatus.

The invention is illustrated in the annexed drawings in which—

Figure 1 is a horizontal section of the apparatus and Fig. 2 a vertical section on the line A B C D of Fig. 1. Fig. 3 represents a portion of one of the turbine-wheels on a larger scale, and Fig. 4 a portion of the end of a shaft belonging to the right-hand side of the apparatus as seen in Fig. 1. Fig. 5 is a section of part of a water-jacket or casing which may be provided for the purpose of cooling the fluid.

The centrifugal compressor comprises two parallel shafts a and b. To the shaft a is fixed a series of centrifugal turbine-wheels T′, T², T³, and to the shaft b a series of turbine-wheels t', t^2. The shafts a and b are driven with equal speeds, and only one of them need be directly coupled to the motor, the other shaft being in that case connected to the directly driven shaft by means of gear-wheels, a belt and pulleys, or other suitable mechanism.

The manner in which the turbine-wheels are fixed to the shafts is as follows. Each turbine-wheel comprises a body which is in part tubular and the other part of which is hollowed out to form, with cheeks g, a series of ducts f. The tubular part or hub of each turbine-wheel surrounds the respective shaft and is provided with an externally screw-threaded part h and an internally screw-threaded part o, the parts h and o being of somewhat smaller diameter than the rest of the hub. The internal and external screw-threads are of equal pitch, and the direction of both is opposed to the direction of rotation of the shafts a and b, but the internal thread is somewhat longer than the external thread. Between the parts h and o the internal diameter of the hub is somewhat larger than the diameter of the shaft. The hubs of adjacent turbine-wheels are simply screwed together, and the distance between the shoulder u of the turbine-wheel and the face d of the next exactly determines the distance between the wheels. Each of the shafts a and b is screw-threaded near one end, at i, the part o of the last turbine-wheel of the series on the shaft being screwed to the said part i. A flange q is provided adjacent the screw-threaded part i to form an abutment for the respective turbine-wheel, so that by means of the said flange, the entire series of turbine-wheels is positioned on the shaft. Each of the shafts a and b is provided with a prismatic part r to facilitate the supporting thereof during the assembling of the parts. At p each shaft is screw-threaded for the reception of a nut and guard-nut, which assists in holding the turbine-wheels in position. The shafts are mounted in bearings j and j', and if necessary intermediate bearings are provided.

The frame or body of the apparatus is built up of a series of parts making contact in the vertical planes k l and k' l'.

The chambers m', m^2, m^3 into which the fluid passes from the turbine-wheels are provided with spiral partition-walls n' n^2 n^3 by which the current of fluid is sub-divided, but in the case of the last chamber of the series the partition-wall may be dispensed with, a discharge-nozzle for the fluid under pressure being provided instead.

If necessary the apparatus is provided with a water-jacket V, each portion of the body being in that case integral with, or fixed to, a corresponding portion of the jacket, and the adjacent portions of the jacket communicating with each other at S S′ (Fig. 5); the contact surfaces are of course turned and dressed to make tight joints.

The action of the apparatus is as follows: Fluid introduced into the apparatus at c passes to the first turbine-wheel, which is revolving at very high speed, and the fluid is thus forced into the chamber m', in which it is distributed between the walls n', n^2, n^3. The walls form a feature of the invention and prevent the production of eddy-currents and consequent waste of energy. Another essential feature of the invention lies in the fact that the chamber m' directly conducts the fluid to the orifice of the

second turbine-wheel, without any reversal of flow. The fluid thus successively passes from the circumference of one turbine-wheel to the orifice of the next.

An indefinite number of turbine-wheels can be used, according to the degree of pressure required, and the number may be even or uneven.

The depth of the wheels and casing in the longitudinal sense need not be uniform, as illustrated, but may gradually decrease from the first wheel to the last, that is to say from the entrance of the fluid to the discharge, in order to increase the final pressure of the fluid.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A centrifugal apparatus for compressing and propelling fluids comprising in combination two parallel shafts, a first series of centrifugal turbine-wheels mounted on one of said shafts, a second series of centrifugal turbine wheels mounted on the other shaft so that each of these wheels is arranged and engaged between two adjacent wheels of the first series, and a casing inclosing both series of wheels and having inlet and outlet orifices arranged so that each of the outlet orifices for the wheels of the first series leads directly to the inlet orifice for the adjacent wheel of the second series, and that each outlet orifice for the wheels of the second series leads directly to the inlet orifice for the adjacent wheel of the first series, substantially as described and for the purpose set forth.

2. A centrifugal apparatus for compressing and propelling fluids comprising in combination two parallel shafts, a first series of centrifugal turbine wheels mounted on one of said shafts, a second series of centrifugal turbine wheels mounted on the other shaft so that each of these wheels is arranged and engaged between two adjacent wheels of the first series, a casing inclosing both series of wheels and having inlet and outlet orifices arranged so that each of the outlet orifices for the wheels of the first series leads directly to the inlet orifice for the adjacent wheel of the second series and that each outlet orifice for the wheels of the second series leads directly to the inlet orifice for the adjacent wheel of the first series, spiral chambers formed in said casing respectively around each turbine wheel, and partition walls arranged within said spiral chambers parallel to each other and to the walls of the chambers, substantially as described and for the purpose set forth.

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

CARLO WEDEKIND.

Witnesses:
LUIGI DE FALCO.
MAXIME NICOLAS.