No. 875,188. PATENTED DEC. 31, 1907.

C. KOHLER.

ROTARY BLADE COMPRESSOR.

APPLICATION FILED FEB. 4, 1907.

Fig. 1

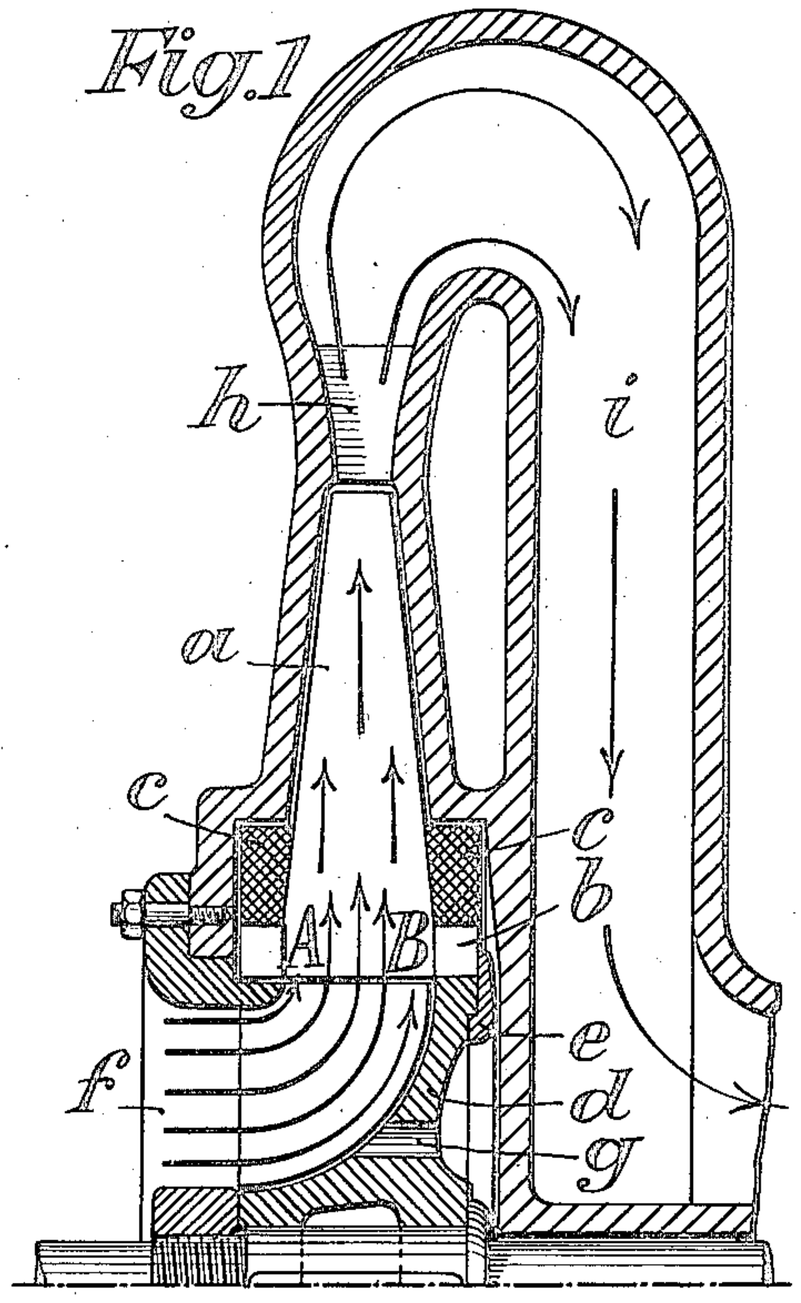
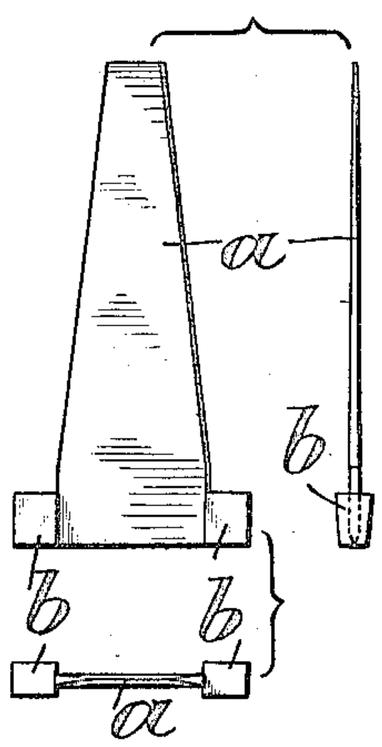


Fig. 2



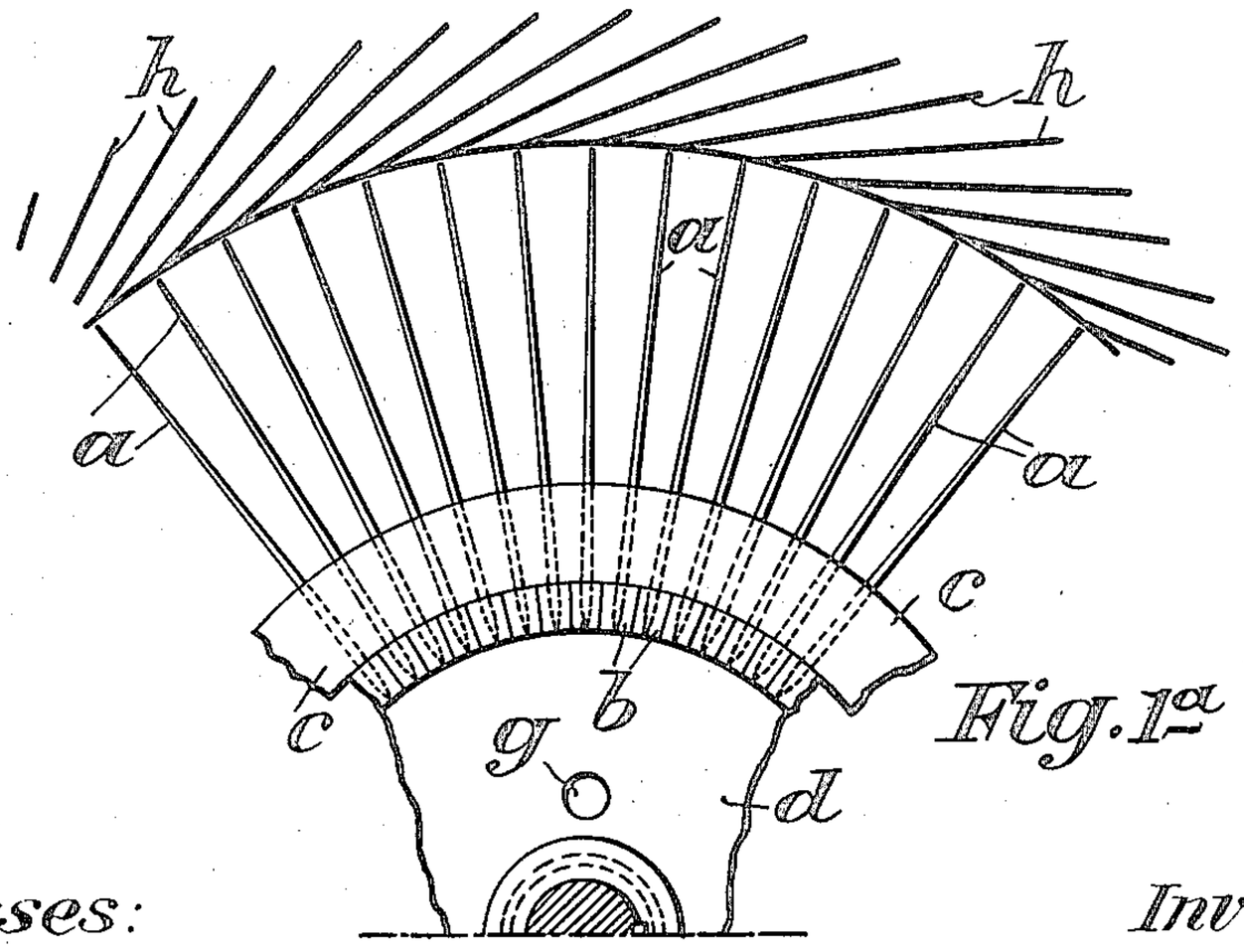


Fig. 1a

Witnesses:

P. Dommers

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UNITED STATES PATENT OFFICE.

CONRAD KOHLER, OF ZURICH, SWITZERLAND.

ROTARY BLADE-COMPRESSOR.

No. 875,188. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed February 4, 1907. Serial No. 355,712.

To all whom it may concern:

Be it known that I, CONRAD KOHLER, a citizen of the Republic of Switzerland, residing at Zürich, in Switzerland, have invented certain new and useful Improvements in Rotary Blade-Compressors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Prior constructions of rotary compressors whose buckets are formed by free radially located blades, since their inlet surfaces are disposed vertically to the axis of the shaft, all have the defect that owing to the differences of pressure at various distances from the shaft, troublesome eddies are formed on entry, whereby both the capacity and the consumption of power of the compressor are unfavorably influenced. A current entering adjacent to the shaft, on its passage to the greatest diameter of the inlet opening will be compressed by the work of the centrifugal forces between the radii, while the current which should enter at the outside still has the pressure which prevails in front of the running wheel. This latter current, therefore, can not enter the running wheel; and what is still more serious, the air in the interior of the running wheel which has been raised to a higher pressure will commence to leave the running wheel, since the latter is open on the inlet side, and an intense eddy, closed within itself, will form, causing loss of power and seriously obstructing the entering current. These conditions are scarcely essentially altered even if, in order to at all events insure proper angles of entry, a rotating or stationary guide device is fixed in front.

The object of the present invention is to effectually overcome these defects.

In the accompanying drawing, Figure 1 is a vertical sectional view showing one form of construction of the invention. Fig. 1[a] shows a cross section through Fig. 1. Fig. 2 shows in front and side elevation and plan one of the blades of the running wheel.

The current enters at the circumference of a cylindrical surface A B, which lies coaxially with the shaft. The air is supplied through the stationary guide device *f*. Except for the extremely small difference in density which occurs owing to the bends of the air paths in the directrix, the air reaches the running wheel with perfectly uniform velocity and pressure. At every point of the inlet surface, therefore, the guide bucket has the same angles, and absence of shocks on entry is insured, whereby the best performance both in respect to volumetric capacity and efficiency is attained. This method of inlet, however, renders a novel construction of running wheel necessary, which is likewise the subject matter of the present invention.

As Fig. 1 shows, the running wheel consists of separate blades *a*, which, as will be seen from Fig. 2, are furnished right and left with lugs *b*, which latter, on the blades being assembled to form the wheel, make contact either directly or with the aid of intermediate pieces, thus forming a closed cylinder at each side of the wheel. The rings *c* are shrunk onto this cylinder and the wheel thus constituted is pushed over the boss *d*, where it is securely held by the covering ring *è*. To overcome lateral pressure the boss is provided with holes *g*. On leaving the running wheel the air current is conducted through a distributer *h* of well-known construction. The blades *a* themselves are of diminishing cross section in radial direction according to the law that the strain due to the centrifugal forces is the same in all cross sections, that is, the shape of the blade is one of approximately uniform strength.

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

1. In a rotary compressor for elastic fluids, stationary walls laterally confining the bucket passages; a running wheel, having flat radial blades which are located between the said walls and present a cylindrical terminal surface having inlet openings, and have lugs on each side of their inner ends; and rings fitting over the lugs and holding the assembled blades together on the wheel; substantially as described.

2. In a rotary compressor for elastic fluids, stationary walls laterally confining the bucket passages; a running wheel, having flat radial blades which are located between the said walls and present a cylindrical terminal surface having inlet openings, the inner ends of each blade being provided with lugs at both sides, whereby the assemblage of blades presents continuous annular flanges; rings fit-

ting over the lugs and holding the assembled blades together on the wheel boss; and a laterally located annular keeper retaining the blades in place on the boss; substantially as described.

3. In a rotary compressor, a compressor wheel comprising flat radial blades having lateral lugs thicker than the blade and a boss to which said blades are secured.

4. In a rotary compressor, a compressor wheel having a boss with a flaring wall, flat radial tapered blades having lateral lugs at their roots, the roots of the blades being substantially parallel to the axis of rotation of the wheel, and securing rings shrunk around said lugs.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

CONRAD KOHLER.

Witnesses:
ERNST FISCHER,
JOSEPH SIMON.