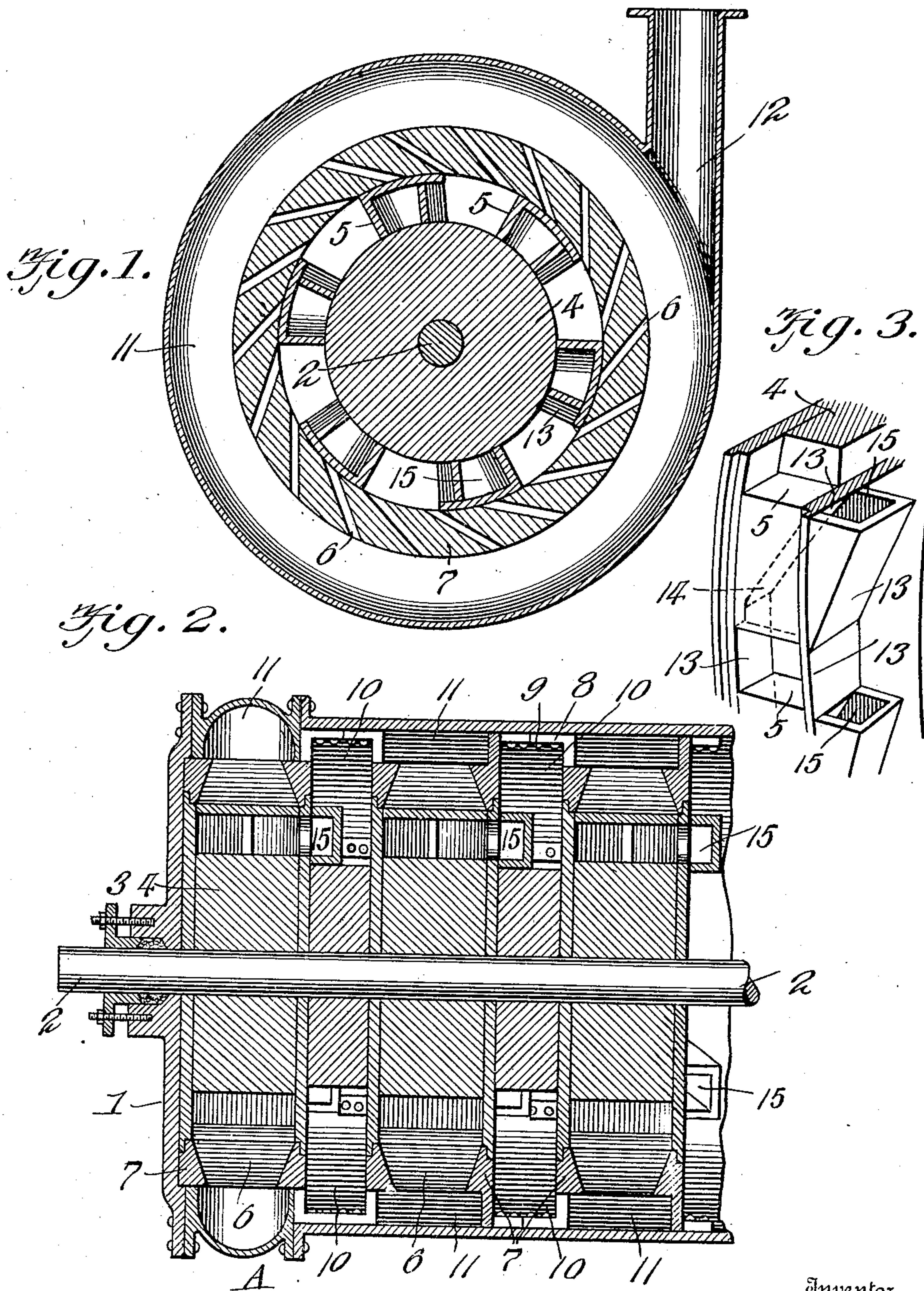


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ELASTIC FLUID TURBINE.  
APPLICATION FILED OCT. 15, 1908.

908,280.

Patented Dec. 29, 1908.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## ELASTIC-FLUID TURBINE.

No. 908,280.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed October 15, 1908. Serial No. 457,858.

*To all whom it may concern:*

Be it known that I, OTTO KRAHENMANN, Jr., a citizen of the United States, residing at St. Louis city and State of Missouri, have  
5 invented new and useful Improvements in Elastic-Fluid Turbines, of which the following is a specification.

This invention relates to an elastic fluid turbine and more particularly to a novel arrangement of buckets and nozzle rings for  
10 delivering tangential jets of vapor against the buckets.

The invention has for one of its objects to improve and simplify the construction of  
15 apparatus of this character so as to be comparatively simple and inexpensive to manufacture, and so designed that the motive fluid will act successively on different sets of buckets so as to effectively abstract  
20 the energy.

The invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.  
25

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a transverse section on  
30 thereof. Fig. 2 is a central longitudinal section of a portion of the turbine. Fig. 3 is a detail perspective view of a portion of one of the wheels showing the bucket construction.

35 Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawing, A designates the cylindrical casing of the turbine which  
40 is closed at its end by heads 1 and extending through the heads is the wheel-carrying shaft 2, there being packings 3 around the shaft where it extends through the heads. On the shaft 2 are spaced wheels 4 that are  
45 provided with peripheral buckets 5 against which the steam or motive fluid is directed in a tangential direction through nozzle passages 6 arranged in nozzle rings 7 extending around the periphery of the wheel and  
50 secured to the casing A by lugs 8 through which extend rivets or other fastenings 9. Arranged between the adjacent wheels are annular chambers 10 into which steam passes from a preceding stage or wheel compartment and from which steam passes to  
55 the succeeding nozzle ring, there being an

annular passage 11 around the nozzle rings so that steam can be distributed to all the nozzle passages. As shown in Fig. 1, the steam-distributing passage 11 for the first  
60 set of nozzles has an inlet 12 which is connected with a suitable source of motive fluid.

As shown in Fig. 3, the wheels are formed with radially-disposed buckets or abutments 5 against which the steam strikes  
65 and these buckets are disposed between transverse walls 13 that inclose the space behind each bucket and form a pocket which is partially closed by a cover 14. The rear portion of the pocket is formed  
70 into an obliquely-disposed passage 15 through which the steam discharges at one side of the wheel so that after the steam strikes upon the bucket 5, it will expand rearwardly and flow out of the passage 15  
75 into the annular chamber 10 at the discharge side of the wheel and from this annular chamber steam passes to the next stage and repeats the operation. In this manner, the steam gradually gives up its  
80 power to the moving element of the turbine.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of  
85 the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I  
90 now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims  
95 appended hereto.

Having thus described the invention, what I claim is:—

1. A turbine comprising a casing, a plurality of wheels mounted therein, annular  
100 nozzle rings surrounding the wheels and formed with annular distributing chambers and with tangentially discharging passages communicating with the chambers and disposed over the wheels, compartments between a preceding wheel and succeeding distributing chamber for conducting the fluid  
105 exhausted from the wheel to the following distributing chamber, and peripheral buckets on the wheels having covers partially closing the spaces between adjacent buckets  
110 and provided with laterally and rearwardly



discharging passages communicating with the said compartments.

2. A turbine wheel provided with peripheral pockets having radially-disposed fluid-impinging surfaces and closed at opposite sides by walls, one of the walls having an opening adjacent the rear portions of the pocket, devices supported by said walls for receiving fluid from the openings and discharging the same rearwardly and laterally, and covers extending partially over the pockets at the rear portions thereof.

3. A turbine wheel provided with spaced

pockets in the periphery thereof, each pocket having a radially-disposed fluid impinging surface, a cover disposed over the rear portion of the pocket, the side walls of the pocket being deflected laterally at the rear to form an obliquely-disposed fluid discharging passage at the side of the wheel.

In testimony whereof I affix my signature in presence of two witnesses.

OTTO KRAHENMANN, JR.

Witnesses:

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