

E. FISHER, JR.  
CONDENSER.

APPLICATION FILED JULY 22, 1910.

988,991.

Patented Apr. 11, 1911.

Fig. 1

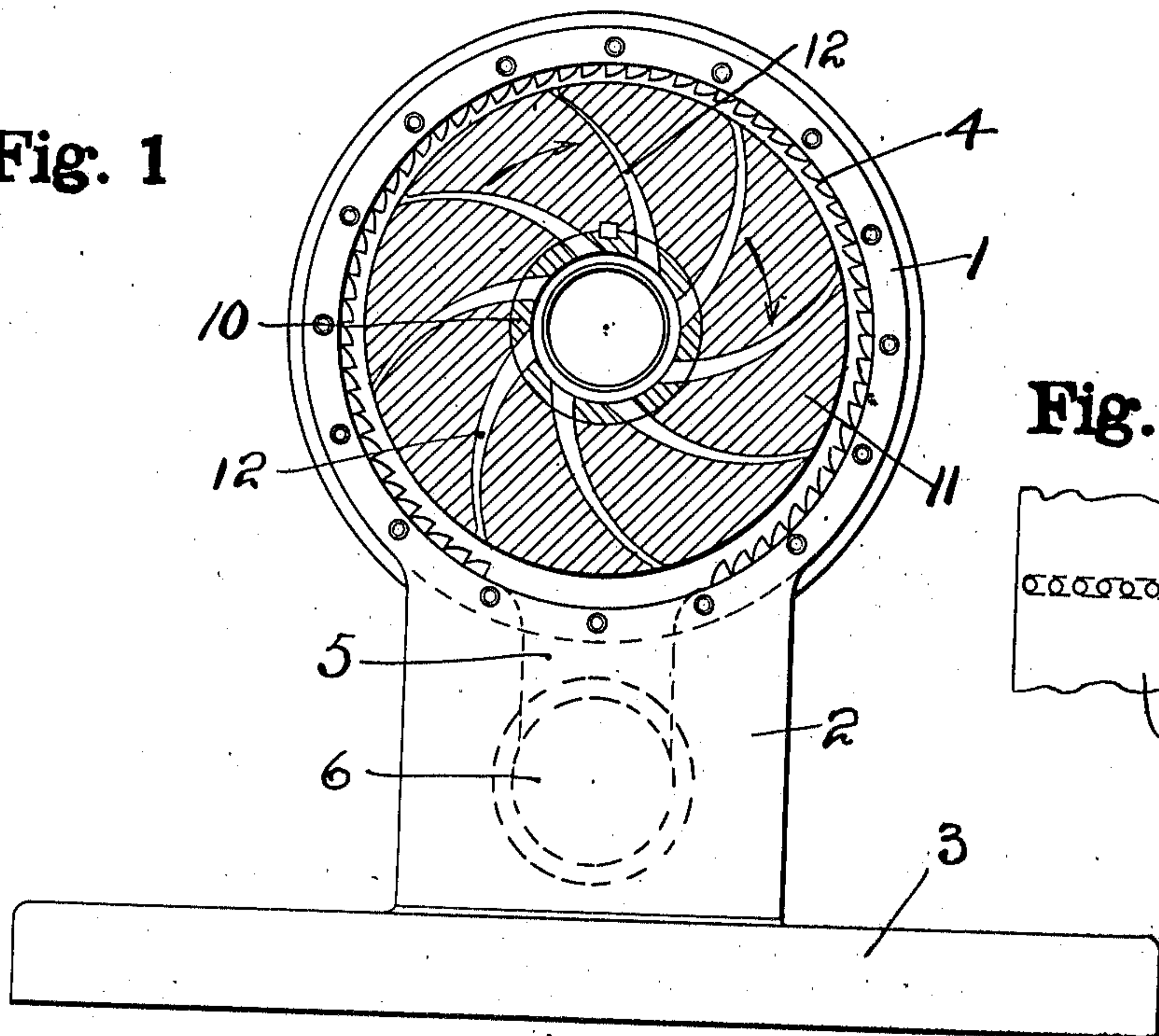


Fig. 3

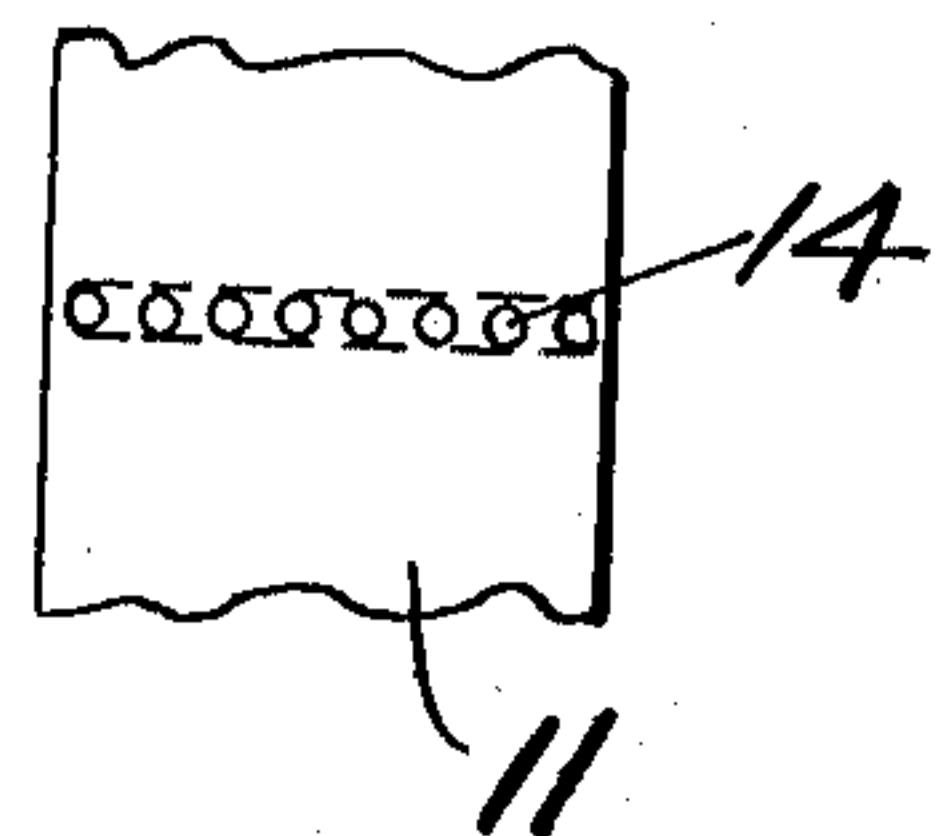
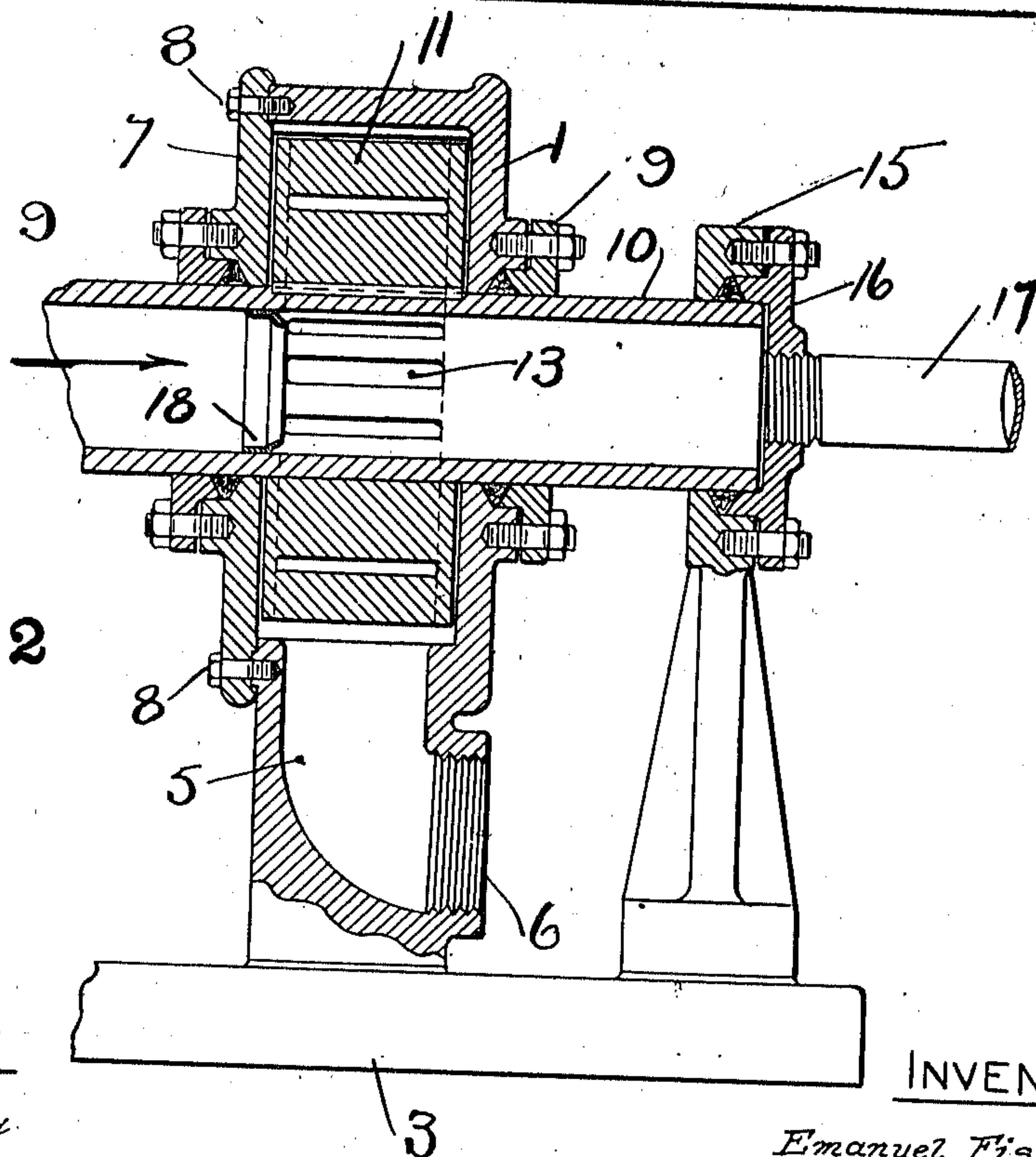


Fig. 2



WITNESSES

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# UNITED STATES PATENT OFFICE.

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CONDENSER.

988,991.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed July 22, 1910. Serial No. 573,243.

*To all whom it may concern:*

Be it known that I, EMANUEL FISHER, JR., a citizen of the United States, residing at the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Condensers, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention has reference to improvements in a condenser for fluids, and its object is to provide an inclosed rotatable drum having radial passageways through each of which a film or jet of water is passed by the action of centrifugal force to effect a partial vacuum in a central exhaust chamber and to effectively liquefy the exhaust from the engine.

20 With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

25 In the accompanying drawings: Figure 1— is an end elevation of the condenser showing the rotatable drum in section. Fig. 2— is a central sectional side elevation of the condenser showing the hollow exhaust fluid conducting shaft on which the condenser is mounted. Fig. 3— is a short section showing the outlet holes in the outside of the drum leading from one of the inner radial passageways.

35 In the drawings there is shown a cylindrical casing 1 supported on a standard 2 from the base 3. The inner circumferential surface of this casing is preferably provided with a set of teeth or corrugations 4 and its standard 2 is provided with a channel 5 out through which the water of condensation passes, its lower end 6 being threaded to receive a suitable pipe for conducting this water to any convenient tank or waste receptacle. The front plate 7 is arranged to be secured by bolts 8 to this casing. Both this front plate and the rear plate of said casing are provided with packing glands 9 through which the central or engine exhaust shaft 10 extends. Mounted on this shaft and arranged to rotate therewith and within the casing 1, is a drum 11 which is provided with a plurality of radial passageways 12 preferably slightly curved so that the discharge of the fluid from the ends thereof will be in a direction opposite to that of the

rotation of the drum. The inner ends of these passageways are arranged to register with slots 13 in the hollow shaft 10 and their outer ends communicate with the peripheral or outer face of the drum through the holes 14, see Fig. 3. A bearing 15 having a packing gland 16 is arranged at the end of the shaft for the reception of the water inlet pipe 17. A collar 18 may be inserted into the interior of the hollow shaft to serve as a dam and check the flow of the condensing water at the inner edge of the openings through the radial channels in the drum in case an unusual flow of water should enter through pipe 17.

70 The operation of my improved condenser may be more particularly described as follows: The exhaust steam from the engine, not shown, flows through the hollow shaft 10 in the direction indicated by the arrow. A small stream of water from any convenient source enters preferably at the end of this shaft through the small water supply pipe 17 and as this shaft is rapidly rotated the water naturally pressed forward by the pressure behind it, takes the form of a thin film around the inside wall of said tubular shaft, until it reaches the apertures or openings 13 to the radial passageways 12, where it meets the steam, and owing to the centrifugal force both are caused to pass out together through the radial passageways in the rapidly rotating drum and the whole is forcibly ejected through the small holes or openings 14 in the periphery of the drum and is thrown against the corrugations or teeth in the inner circumference of the casing where the steam and water are mingled together, the steam and vapor condenses and the whole turned into water when it works its way around the drum and finally passes through the channel 5 out into the waste or tank, (not shown). The rapid passing of the steam and water by centrifugal force out through the radiating veins causes a partial vacuum to be formed in the steam receiving hollow shaft, serving to quickly draw the exhaust from the engine, and also serve to act as a pump to draw in the condensing water through the pipe 17, if desired.

110 My improved condenser is more particularly designed to operate in conjunction with a steam turbine engine having a central exhaust, but it may operate with any



style of engine to condense the vapors exhausted therefrom.

Having thus described my invention, what I claim is:

5 1. A condensing apparatus comprising a central rotatable tubular member forming an exhaust receiving chamber, a rotatable element provided with radial channels communicating with said chamber, a casing inclosing said element, and means for supplying water to said central chamber to meet the steam therein.

10 2. A condensing apparatus comprising a hollow rotatable central member forming an exhaust steam receiving chamber, means for admitting water to said chamber to meet the steam therein, a drum mounted on said member and provided with a plurality of radial channels, a casing inclosing said drum, and means in said casing for breaking up and mixing the steam and water as it is ejected from said channels.

15 3. A condensing apparatus comprising a hollow rotatable central member forming an exhaust steam receiving chamber, means for admitting water to said chamber, a partial barrier in said chamber, a drum mounted on and fixed to said member and provided with a plurality of radial channels, a casing inclosing said drum, and means in said casing for breaking up and mixing said steam and water as it is ejected from said channels.

20 4. A condensing apparatus comprising a hollow central rotatable shaft forming an exhaust receiving chamber, a drum provided with radial channels and mounted to rotate with said shaft, a casing inclosing said member and means for supplying water to said central chamber to meet the steam therein.

25 5. A condensing apparatus comprising a hollow central rotatable shaft forming an exhaust receiving chamber, a rotatable member mounted on said shaft and provided with a plurality of radial channels communicating with said chamber, means for supplying water to said chamber, a casing inclosing said member, said casing being provided with a corrugated surface against which the fluid impinges when ejected from said channels.

45 a plurality of radial channels communicating with said chamber, means for supplying water to said chamber, a casing inclosing said member, said casing being provided with a corrugated surface against which the fluid impinges when ejected from said channels.

50 6. A condensing apparatus comprising a hollow central rotatable shaft forming an exhaust steam receiving chamber, a water supply pipe leading to said chamber, a member mounted on and fixed to said shaft to rotate therewith and provided with a plurality of radial channels communicating at their inner ends with said chamber and their outer ends terminating in a plurality of small holes, a casing inclosing said member the interior surface of said casing being provided with corrugations against which the fluid impinges when ejected from said channels, and said casing being provided with an outlet opening in its base.

55 7. A condensing apparatus comprising a hollow central shaft forming an exhaust steam receiving chamber, a water supply pipe leading to said chamber, a dam in said chamber, a member mounted on and fixed to said shaft to rotate therewith and provided with a plurality of radial channels communicating at their inner ends with said chamber and their outer ends terminating in a plurality of small holes, a casing inclosing said member the interior surface of said casing being provided with corrugations against which the fluid impinges when ejected from said channels and said casing being provided with an outlet opening in its base.

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

EMANUEL FISHER, JR.

Witnesses:

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