No. 677,376. Patented July 2, 1901.

M. SCHARFBERG.

TURBINE FOR WATER MAINS.

(Application filed Nov. 5, 1900.)

(No Model.)

Fig. 1.

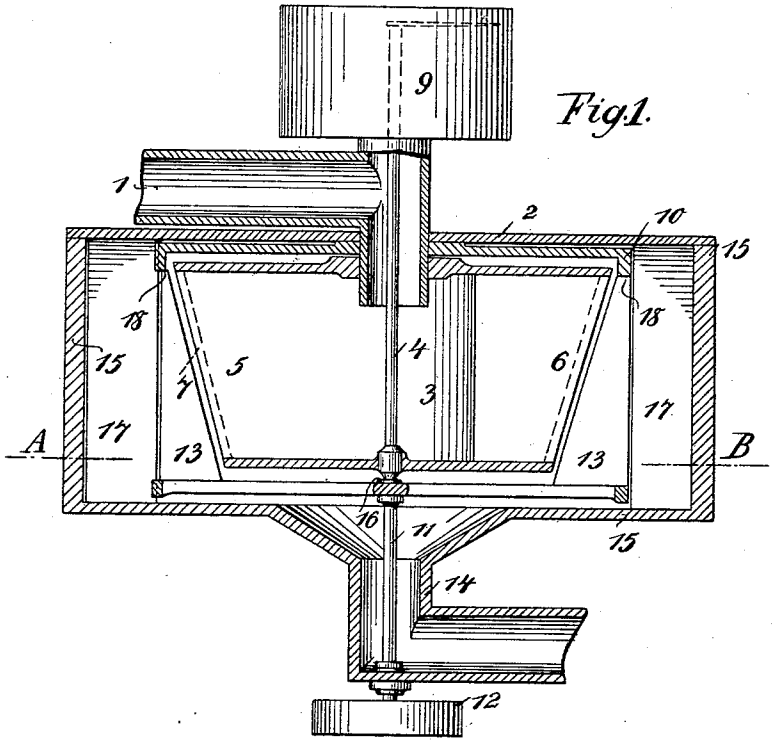
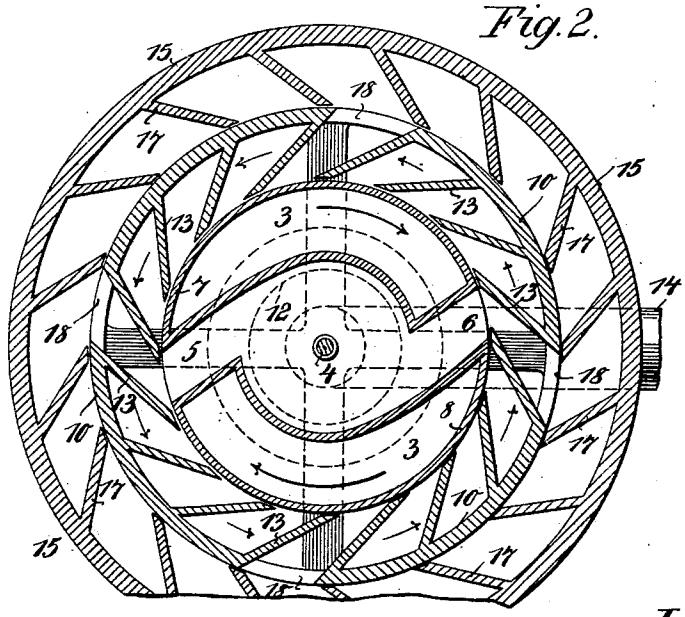


Fig. 2.



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UNITED STATES PATENT OFFICE.

MORITZ (RECTE MOSES) SCHARFBERG, OF BERLIN, GERMANY.

TURBINE FOR WATER-MAINS.

SPECIFICATION forming part of Letters Patent No. 677,376, dated July 2, 1901.

Application filed November 5, 1900. Serial No. 35,532. (No model.)

To all whom it may concern:

Be it known that I, MORITZ (RECTE MOSES) SCHARFBERG, merchant, a subject of the German Emperor, residing at Berlin, in the Empire of Germany, have invented new and useful Improvements in Apparatus in Connection with Water-Mains, of which the following is a specification.

The present invention relates to an improved apparatus in connection with a water-main.

The purpose aimed at by my invention is to register the consumption of water and to transmit the pressure of the water which has hitherto remained unutilized to any suitable accumulator, so that the power thus stored can be employed for various purposes—such, for instance, as illumination purposes and the like.

Other objects of the invention are to simplify and cheapen the construction and to render most efficient, durable, and serviceable in operation the apparatus constructed for the purpose.

To these ends and to such others as the invention may pertain the same consists in the peculiar combination and in the novel construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the accompanying drawings, and then specifically defined in the appended claims.

Referring to the drawings, Figure 1 represents a vertical section through the apparatus according to my invention. Fig. 2 is a section on line A B of Fig. 1.

The supply-pipe 1 of the water-main passes through an aperture in the lid 2 of the casing 15 and terminates in a turbine wheel 3. The turbine wheel 3, which is constructed in the shape of a reversed cone the apex of which has been cut off, rests with the point of its shaft 4 in a suitable bearing 16, which constitutes the center of a rotary frame to which the outer turbine wheel 10 is secured. The inner turbine wheel 3 is provided with two exit-passages 5 6, which terminate in the circumferential wall 7 8 of same. The shaft 4 of the turbine wheel 3 is in connection with a registering device 9, which indicates the revolutions of said shaft 4 in any suitable and well-known manner. This registering or indicating device 9, which may obviously be of any desired suitable construction, shows the amount of water consumed.

The external turbine wheel 10, which is attached to the rotary frame, as hereinbefore stated, or which may constitute same directly by being suitably constructed, surrounds the inner turbine wheel 3. Said turbine wheel 10 is supported on a shaft 11, the rotation of which is transmitted by means of a pulley 12 or in any other suitable manner to an accumulator of any desired suitable construction.

The inner surface of the external turbine wheel 10 is fitted with blades 13, standing at oblique angles to tangent planes in regard to the circumferential wall of said wheel 10, as indicated in Fig. 2. The shape of these blades 13 is triangular in order to correspond to the conical surface of the inner turbine wheel 3, as shown in Fig. 1. The rotary frame, which supports the turbine-wheel 10 and which may either be integral with or separate from the wheel 10, as hereinbefore stated, constitutes the open bottom of the turbine wheel 10 in order to permit the escape of the water through the exit-pipe 14, situated beneath the said rotary frame. The circumferential wall of the turbine wheel 10 is provided with exit-openings 18 at four oppositely-located parts to conduct the water against blades 17, fitted to the internal circumferential wall of the casing 15. This arrangement serves for the purpose of enabling a more complete utilization of the power of the water in the rotation of the external turbine wheel 10. There are only four exit-openings 18 provided in the circumferential wall of the said wheel 10, so as to keep this wall as strong as necessary.

The operation of the apparatus hereinbefore described is as follows: The water from the main flows through the supply-pipe 1 into the inner turbine wheel 3 and through the exit-openings 5 and 6, encountering the blades 13 of the external turbine wheel 10 on its exit from the inner turbine wheel 3, whereby the inner turbine wheel is rotated in one and the outer turbine wheel in the opposite direction. The revolutions of the shaft 4 of the inner turbine wheel 3 are transmitted to the indicating device 9, whereas the rotation of the shaft 10 is transmitted, by means of

the pulley 12, when same is employed, to a suitable accumulator. The spent water flows through the open bottom of the outer turbine wheel 10 and between the blades 17 of the casing 15 into the exit-pipe 14, whence it is conducted to the place for its consumption.

It is obvious that the construction of the inner and outer turbine wheel and of the casing may be varied in many respects without departing from the scope of the invention and it is further obvious that the inclined position of the various blades and of the exit-passages of the inner turbine wheel may be chosen to suit the requirements.

The size of the various organs of my improved apparatus can be varied as required to obtain the highest possible return in motive power.

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

1. In combination with a water-main, a turbine wheel having two exit-passages inclined in regard to the circumferential wall, said turbine wheel receiving the water axially and driving an indicating device for registering the amount of water received; an outer turbine wheel having a closed bottom surrounding the inner turbine wheel and adapted to receive the water volumes therefrom so as to be rotated in a direction opposite to that of the inner turbine wheel, blades fitted to the inner circumferential wall of the outer turbine wheel inclined in opposite direction to the exit-passages of the inner turbine wheel; four oppositely-located exit-openings in the circumferential wall of the outer turbine wheel, the shaft of which being adapted to transmit its rotation by suitable transmission means to an accumulator of suitable construction and a casing surrounding the outer turbine wheel, said casing having blades fitted to its inner circumferential wall inclined in opposite direction to the blades of the outer turbine wheel so as to receive the spent water from the four exit-openings of the aforesaid turbine wheel and conduct same to an exit-pipe from whence it reaches its place of consumption, substantially as described and shown.

2. In combination with a water-main, a turbine wheel of conical shape in transverse section and rotatable around a vertical shaft, said turbine wheel having two exit-passages inclined in regard to the circumferential wall, and receiving the water axially, an indicating device of suitable construction in connection with the aforesaid vertical shaft to register the amount of water which passes through the said turbine wheel; an outer turbine wheel, having a closed bottom, surrounding the inner turbine wheel and adapted to receive the water volumes therefrom so as to be rotated in opposite direction to that of the inner turbine wheel; blades of triangular shape to correspond to the conical circumferential wall of the inner turbine wheel, fitted to the inner circumferential wall of the outer turbine wheel at oblique angles to tangent planes in opposite direction to the exit-passages of the inner turbine wheel; four oppositely-located exit-openings in the circumferential wall of the outer turbine wheel, suitable transmission means in connection with the shaft of the latter to transmit its rotation to an accumulator of suitable construction; a casing surrounding the outer turbine wheel having blades fitted to its inner circumferential wall inclined in opposite direction to the blades of the outer turbine wheel so as to receive the spent water from the four exit-openings of the aforesaid turbine wheel; and an exit-pipe in connection with the said casing to receive the water after same has rotated the turbine wheels and to conduct same to its place of consumption, substantially as described and shown.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MORITZ (RECTE MOSES) SCHARFBERG.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.