

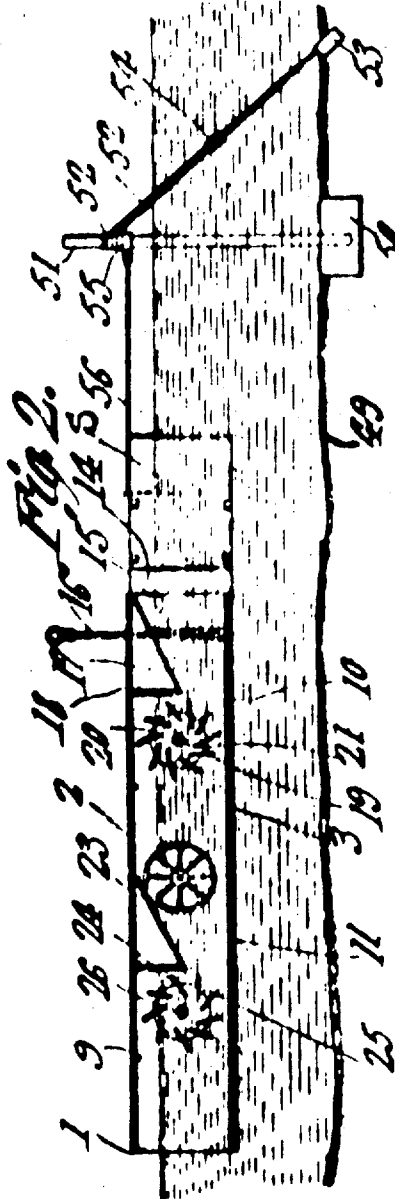
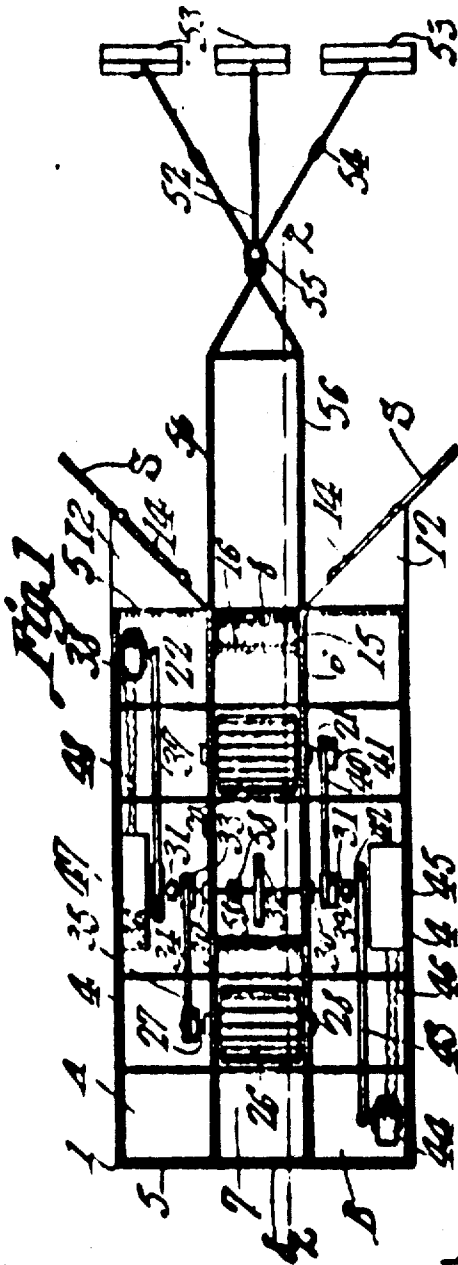
I. H. DUNGAN.
WATER MOTOR.

APPLICATION FILED JAN. 10, 1911

Patented Feb. 20, 1912

EDWARDS SPEER

1,017,860.



Witnesses

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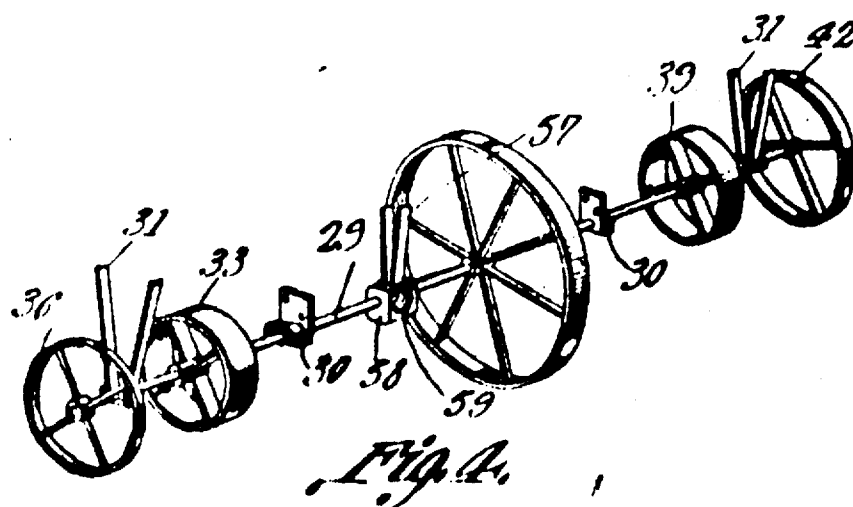
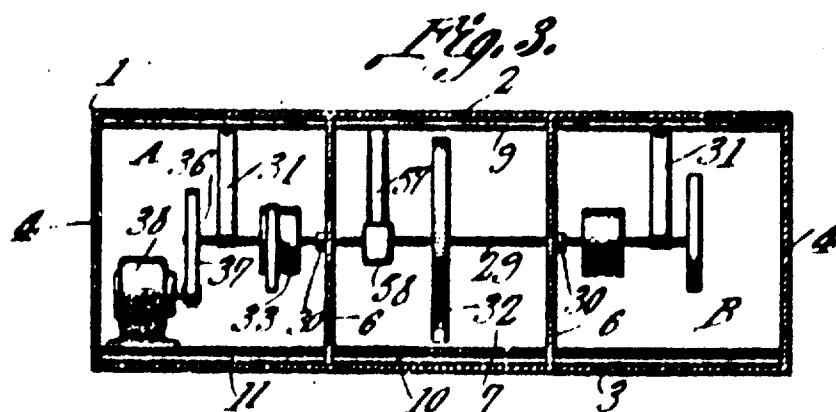
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1 SHEET—CHIEF.



Witnesses

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1,017,860. WATER-MOTOR. ISAAC HILL DUNGAN, Humboldt, Tenn. Filed Jan. 10, 1911. Serial No. 601,813.

To all whom it may concern:

Be it known that I, ISAAC H. DUNGAN, a citizen of the United States, residing at

Humboldt, in the county of Gibson and State of Tennessee, have invented a new and useful Water-Motor, of which the following is a specification.

One object of this invention is to provide a motor whereby the current of a rapidly running stream may be employed for the generation of electricity and the like, the construction of the device being such that it will operate with equal facility, either at low water, or when the stream is running bank-full.

Another object of the invention is to provide a device of this character in which the operating mechanism and the mechanism for generating electricity will be housed in a single casing, novel means being provided for holding the casing pivotally in place in a stream.

A further object of the invention is to provide novel means for regulating and directing the flow of water through the casing, and for delivering the water properly against the water wheels whereby the generating mechanism is driven.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings,—Figure 1 is a horizontal section, wherein sundry details appear in elevation; Fig. 2 is a vertical longitudinal section on line 2—2 of Fig. 1; Fig. 3 is a transverse section; and Fig. 4 is a detailed perspective of the drive shaft and the elements carried thereby.

In carrying out the invention there is provided as a primary and fundamental element, a casing 1, ordinarily consisting of a top 2, a bottom 3, side walls 4, and end walls 5. Extended longitudinally of the casing 1, are partitions 6, defining a shaft 7 in the longitudinal center of the casing, and air-tight compartments A and B upon either side of the shaft. In the end walls 5, there are openings 8, alined with the shaft 7, so that the water may pass freely through the casing 1, from the forward end thereof to the rear end thereof. The top 2 of the casing is supported upon transverse I-beams 9 or the like, the bottom 3 of the casing being

reinforced by other transverse I-beams 10, a false bottom 11 resting upon the last named I-beams.

The casing 1 is supplied with forward extensions 12, the adjacent faces of which converge to form deflectors 14, positioned to direct the flowing water into the shaft 7. The amount of water delivered into the shaft 7 being controlled by draw boards 8, slidably mounted upon the deflecting faces 14 of the extensions 12. Located within the shaft 7, and preferably secured to the partitions 6, adjacent the forward end of the casing, are upright guides 15, in which a gate 16 may be slidably mounted. Positioned adjacent the forward end of the casing 1, and ordinarily supported by the guides 15, is a downwardly and rearwardly slanting deflector 17, provided with an upright arm 18, which may be secured to one of the upper I-beams 9. The lower end of the deflector 17 is spaced apart from the bottom 3 of the casing, and is positioned to discharge into the buckets 19 of an undershot wheel 20, secured to a shaft 21, journaled for rotation in bearings 22, carried by the longitudinal partitions 6. Disposed to the rear of the deflector 17, is another similar, downwardly and rearwardly slanting deflector 23, the forward end of which may be secured to one of the upper I-beams 9. This deflector 23 is connected by means of an upright extension 24, with an adjacent I-beam 9. It will be understood at this point, that the casing 1 may be of any desired length, the water wheels being multiplied to any desired extent. The rear deflector 23 is positioned to discharge against the buckets 25 of an undershot wheel 26, secured to a shaft 27, journaled for rotation in bearings 28, supported in the longitudinal partitions 6.

The invention further includes a drive shaft 29, rotatably held in bearings 30, secured to the longitudinal partitions 6, the drive shaft 29 being further held for rotation, when desired, in bearing brackets 31, which may be secured to the top 2 of the casing. The drive shaft 29 has a fly-wheel 32, ordinarily disposed in the shaft 7, between the water wheels 20 and 26. Secured to the drive shaft 29 and located within the compartment A, is a pulley 33, carrying a belt 34, trained about a pulley 35, secured to one end of the shaft 27. Secured to the drive shaft 29, and located within the compartment A, is a pulley 36, about which is passed a belt 37, operatively connected with a dynamo 38, located in the compartment A adjacent the forward end of the casing 1. Secured to the drive shaft 29, and located within the compartment B, is a pulley 39, about which is passed a belt 40, trained about a pulley 41, secured to the extremity of the shaft 21. Mounted upon the shaft 29

and located within the compartment B, is a pulley 42, about which is passed a belt 43, operatively connected with a dynamo 44, located within the compartment B, relatively near to the rear end of the casing 1. At this point it may be stated that the means

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for connecting the drive shaft 29 with the dynamos 38 and 44 may be varied to suit the taste of the manufacturer of the device, the main point being that the dynamos 38 and 44 are to be connected operatively, in some manner, with the drive shaft 29.

If desired, a storage battery 45 may be located within the compartment B, the storage battery 45 being electrically connected, as shown at 46, with the dynamo 44. Located within the compartment A, may be another storage battery 47, electrically connected, as shown at 48, with the dynamo 38.

Means are provided for anchoring the casing in the bed of a rapidly flowing stream, and, noting particularly Fig. 2, the bed of the stream is denoted by the numeral 49. In the bed 49 of the stream, is located a suitable foundation 50, ordinarily of concrete, in which foundation is secured an upright post 51. The upper ends of ties 52 are secured to the post 51, the ties 52 extending downwardly, in diverging relation, into union with anchors 53, mounted in spaced relation, in the bed 49 of the stream. The ties 52 may be equipped with turn buckles 54, so that the ties may exert a proper tension upon the post 51. Rotatably mounted upon the post 51, is a collar 55, carrying rearwardly projecting tie members 56, secured to the forward end of the casing 1.

Any desired means may be provided for securing the proper ratios of rotation between the shafts 21 and 27 upon one hand, and the armature shafts from the dynamos 38 and 44 upon the other hand. To effect this end, when desired, brackets 57 depending from the top 2 of the casing, or otherwise supported, may uphold a case 58, within which is located a differential gear 59, interposed in the drive shaft 29.

The operation of the device is as follows: The structure having been positioned properly in a stream, as indicated in Fig. 2, the gate 10 is raised, permitting the flowing water of the stream to pass beneath the deflector 17, and to impinge against the buckets 19 of the forward undershot wheel 20. The water continuing its passage through the casing 1, within the shaft 7, shall pass beneath the deflector 23, and be carried downwardly to impinge against the buckets 25 of the rear undershot wheel 26. The shaft 21, through the instrumentality of the belt 40, will actuate the drive shaft 29. The shaft 27, through the instrumentality of the

belt 34 will likewise serve to actuate the drive shaft 29. When the drive shaft is rotated, the belts 37 and 43, will actuate the armature shafts of the dynamos 38 and 44 respectively, the current generated by these dynamos being led off by suitable conductors (not shown), to the points where the

electric current is to be utilized. By reason of the fact that the collar 55 supplies a pivotal mounting for the casing 1 upon the post 51, the casing may swing about readily, to accommodate itself to the direction of current in the stream, the deflecting faces 14 of the extensions 12, serving to direct the flowing water of the stream into the shaft 7, to pass beneath the deflectors 17 and 23, and to actuate the wheels 20 and 26, in the manner above described. Since the collar 55 is slidable longitudinally of the post 51 it will be seen that the casing 1, in partially submerged condition, will rise and fall with the stream, the current of the stream being effective, at all times, to actuate the wheels 20 and 26, no matter how rapidly the water in the stream may rise or fall. Moreover, should the water in the stream rise to such an extent that the casing 1 is entirely submerged, the operation of the device will in no wise be impeded. The machine, therefore, cannot be drowned out and rendered inoperative, no matter to what elevation the water of the stream may rise. Moreover, since dynamos 38 and 44, and the storage elements 45 and 47, are housed in the watertight compartments A and B, the current of electricity, generated by the dynamos, will continue, even though the casing be entirely submerged.

Having thus described the invention, what is claimed is:—

A device of the class described comprising a casing provided with longitudinal partitions, defining a chute through the casing and hermetic compartments on each side of the chute; undershot wheels supported for rotation in the chute; front and rear deflectors in the chute, in advance of the wheels; a drive shaft journaled in the partitions and located in advance of the rear deflector; means in the compartments for connecting the drive shaft with the wheels; a hanger depending into the chute from the top of the casing; a jacket carried by the hanger; a differential in the jacket, and interposed in the drive shaft, the jacket being normally submerged, whereby the differential will be cooled; and a fly wheel upon the drive shaft, the fly wheel being located in the chute, in advance of the rear deflector; the fly wheel constituting a rotating means for preventing a jamming of floating material against the rear deflector.

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In testimony that I claim the foregoing
as my own, I have hereto affixed my signature
in the presence of two witnesses.

ISAAC HILL DUNGAN.

Witnesses:

W. H. BOBBITT,
R. LEE REAVES.