

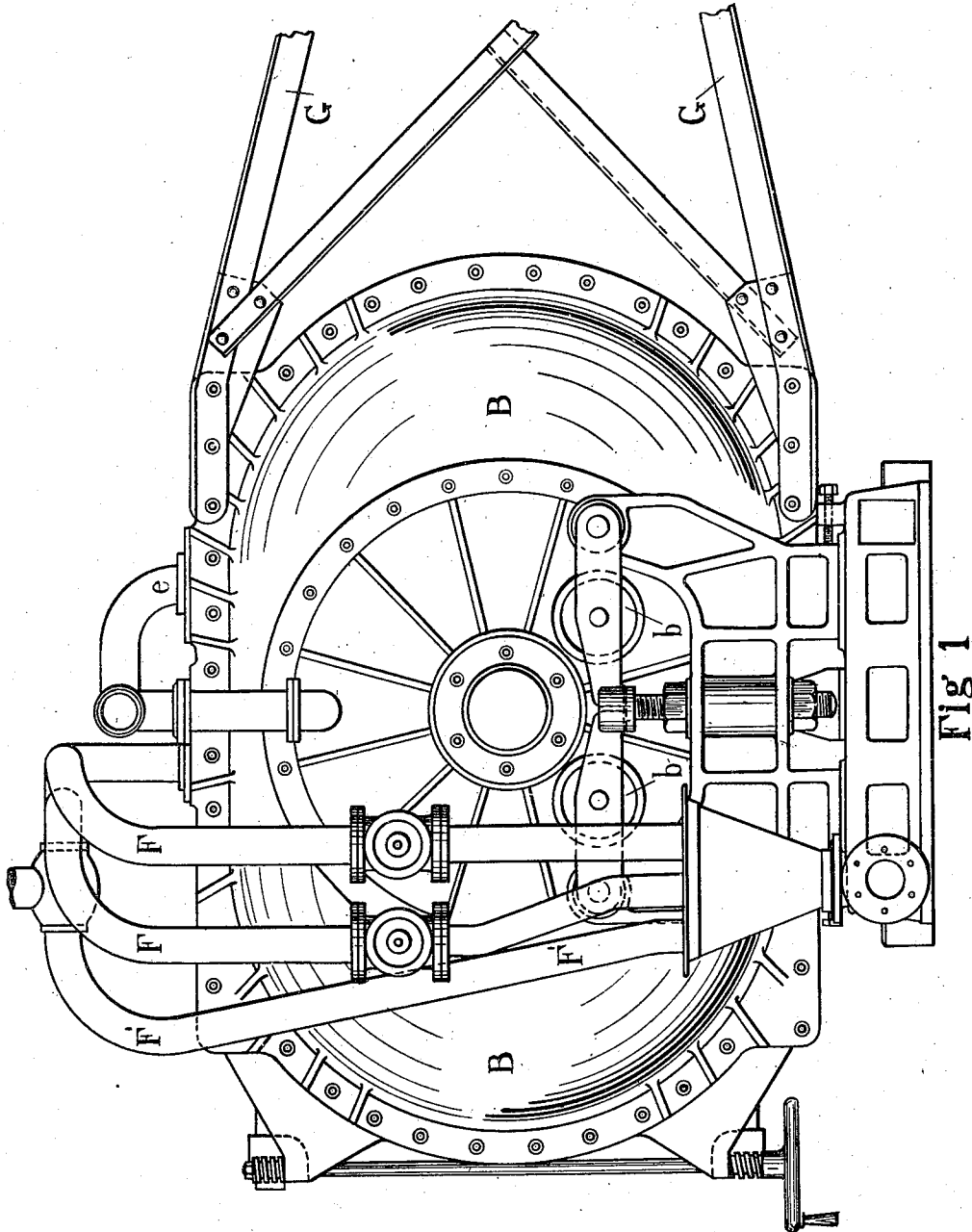
H. N. LEASK.
DYNAMOMETER.

APPLICATION FILED DEC. 30, 1910.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 1.

1,014,494.



WITNESSES

[Signature]
[Signature]

INVENTOR

Henry N. Leask
by *James L. Morris Jr.*
Att'y

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3 SHEETS-SHEET 2

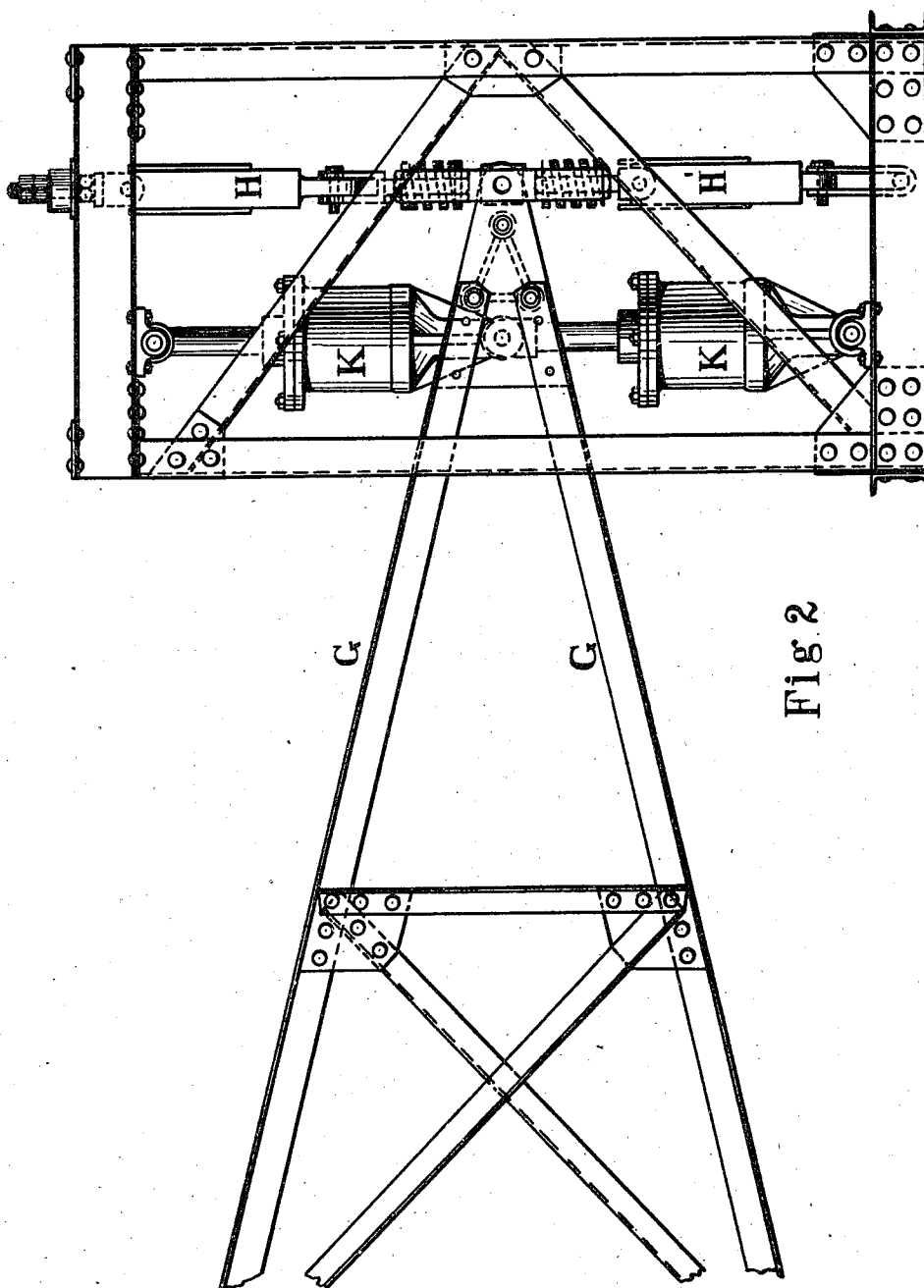


Fig 2

WITNESSES

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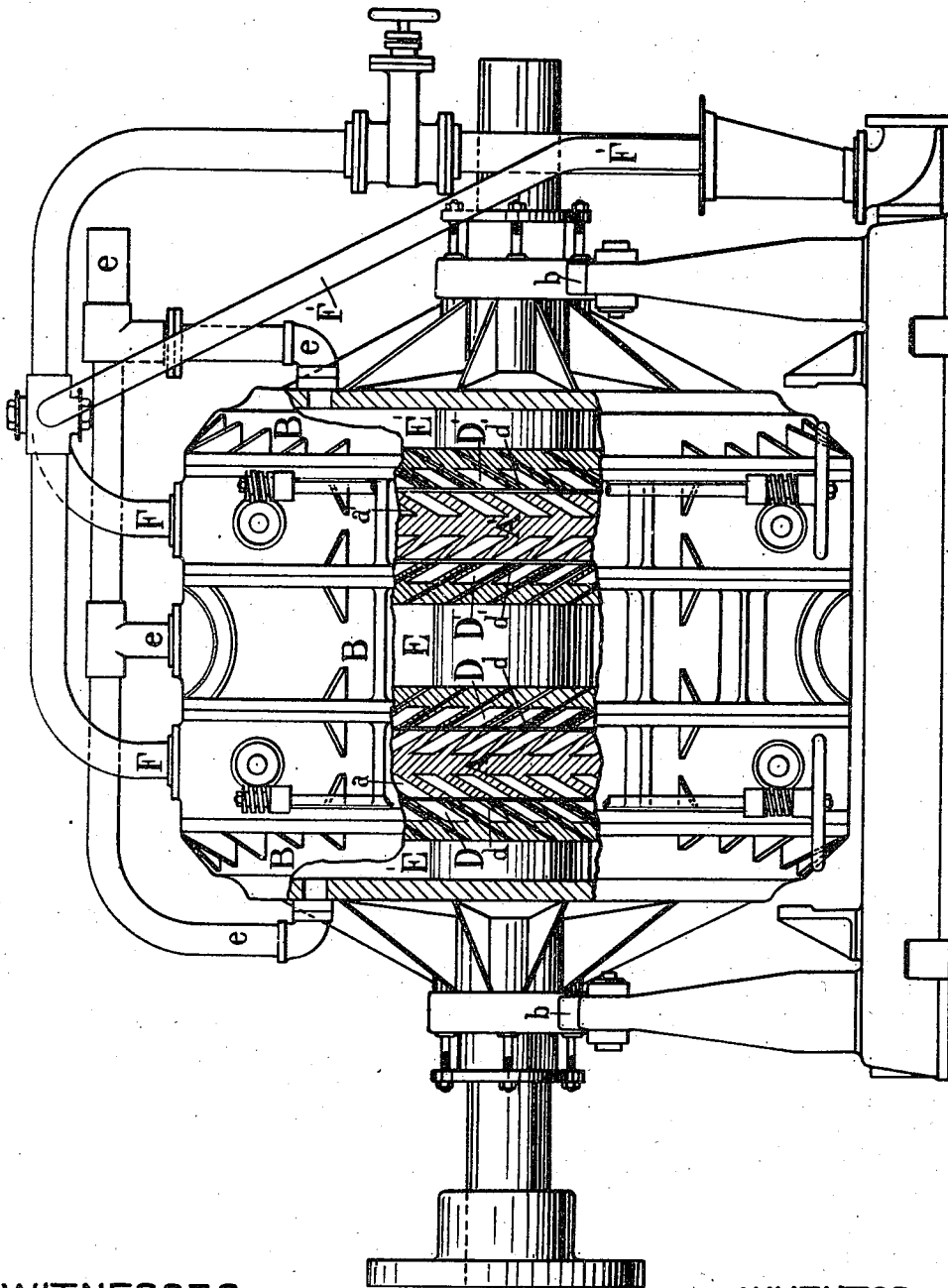


Fig 3

WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY NORMAN LEASK, OF EGREMONT, ENGLAND.

DYNAMOMETER.

1,014,494.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed December 30, 1910. Serial No. 600,008.

To all whom it may concern:

Be it known that I, HENRY NORMAN LEASK, a British subject, residing at Egremont, county of Chester, England, have invented certain new and useful Improvements in Dynamometers, of which the following is a specification.

This invention relates to improvements in dynamometers and is designed to provide a dynamometer that can be run in either direction so that it may be used to test a motor or engine running forward or reversed without uncoupling it therefrom.

It consists essentially in constructing the rotor of the dynamometer with a double, treble or other number of sets of cups having vanes arranged in opposite directions and the casing with an intermediate set or sets of cups and in conjunction therewith connecting to the balance arm two weighing apparatus to act in either direction and a double dash pot which will also act to absorb the vibration and steady the arm in either direction.

The invention will be fully described with reference to the accompanying drawings.

Figure 1. is a side elevation of dynamometer. Fig. 2. is a side elevation being a continuation of Fig. 1. showing double weighing apparatus and dashpots. Fig. 3. is a front elevation with part of casing broken away and rotor and side cups in section.

The rotor I construct with two (or more) sets of cups A and A' each set of cups being constructed in the ordinary way of a circular disk with an annular channel semi-elliptical in cross section on both sides, with a number of vanes a a' therein to form the separate cups. The vanes a in forming the cups A are placed in opposite direction to the vanes a' forming the cups A'. Thus while the machine is running in one direction the cups A are operative and the other set A' are inoperative. The casing B I construct with corresponding sets D and D' of fixed cups formed in a similar manner between which the rotor cups A and A' rotate, the vanes d of one set being placed in the opposite direction to the vanes d' of the other set. A central water chamber E is formed between the fixed cups D and D' in addition to the ordinary water chambers E' at the sides of the machine. Each water chamber is connected to an inlet water pipe

e through which the water is pumped or forced in the ordinary way. From the periphery of each set of cups water is discharged as usual by the outlet or discharge pipes F. To these an additional discharge pipe F' may be connected which is also of ordinary construction by which the temperature and quantity of the water can be measured. The casing B is mounted to rock upon rollers b carried by levers b' which are adjusted as to height by a screw b^2 set in the frame. A balance arm G extends from the casing in the usual manner.

The hand-operated screw shown at the left in Fig. 1-forms no part of the present invention and as disclosed by the British patent to applicant 29,049 of 1909, said hand-operated screw is for the purpose of actuating the interior sluices and is well known in this type of dynamometer. This British patent also clearly discloses the rollers b and the screw b^2 .

To the balance arm G I now connect two weighers H and H' (of lever, balance or other type) one placed above the balance arm G and the other below it, one of which is brought into action as the balance arm is raised and the other as the balance arm is lowered. To the balance arm G there is also connected or attached a double acting dashpot or a pair of dashpots K to control the movement of the balance arm in either direction to steady it and prevent vibration.

Where a double acting dashpot is employed it is preferably constructed with two cylinders one working within the other the inner one forming a piston or ram for the outer one and a piston or ram within the inner cylinder. The inner cylinder is preferably stationary and the piston or ram therein is moved to and fro within it as the outer cylinder is moved or vice versa the outer cylinder may be fixed with the piston and the inner cylinder may be moved to and fro within the outer cylinder and over the piston or ram.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In a dynamometer, the combination with an indicating apparatus having resisting means cooperating therewith, of a casing provided with water chambers and associated with said indicating apparatus and a rotor operating in said casing and comprising in its construction a plurality of

sets of cups the vanes of which are disposed in opposite directions to offer an equal resistance.

2. In a dynamometer the combination
5 with a rotor having a plurality of sets of cups the vanes of which are set in opposite directions, a casing with intermediate set of cups, a balance arm connected to the casing, a double dash pot and two weighing apparatus connected to the balance arm to act
10 in either direction.

3. In a dynamometer the combination of a rotor provided with cups and vanes A A' arranged in opposite directions, a casing B
15 with fixed cups and vanes D D' arranged

in opposite directions, a balance arm connected to the casing, said casing being provided with a central water chamber E and with water chambers E' at the sides of the machine and two weighing apparatus to
20 act in either direction and connected to the balance arm.

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

HENRY NORMAN LEASK.

Witnesses:

JOHN WILLIAM THOMAS,
MALCOLM SMETHURST,
J. OWDEN O'BRIEN.