No. 813,963. PATENTED FEB. 27, 1906.

A. FREITAG.

CENTRIFUGAL MACHINE.

APPLICATION FILED JAN. 8, 1902.

2 SHEETS—SHEET 1.

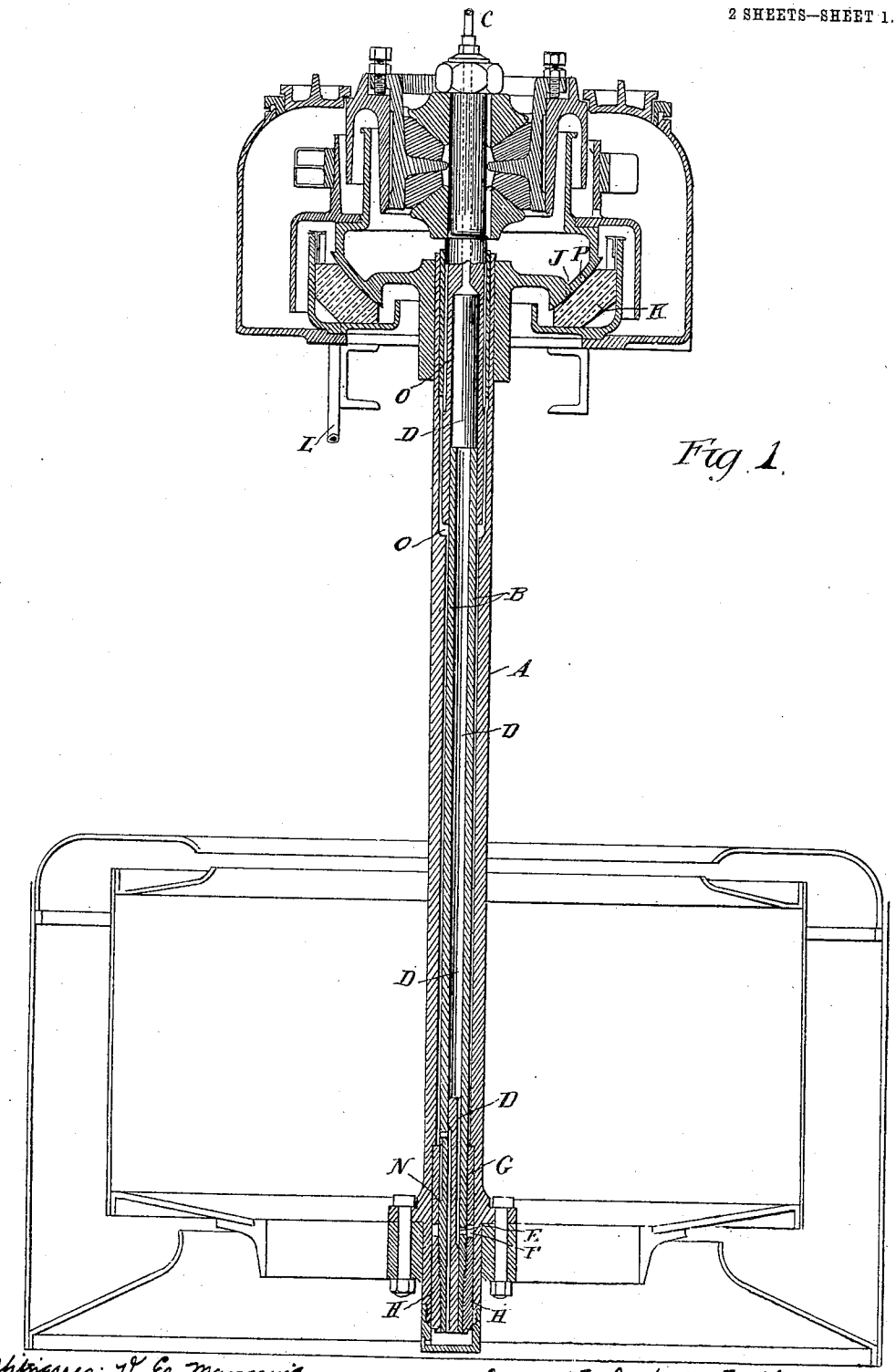

Fig. 1.

Witnesses: H. E. Manning
H. Lewis

Inventor: Andreas Freitag
By Knight Bros. attys.

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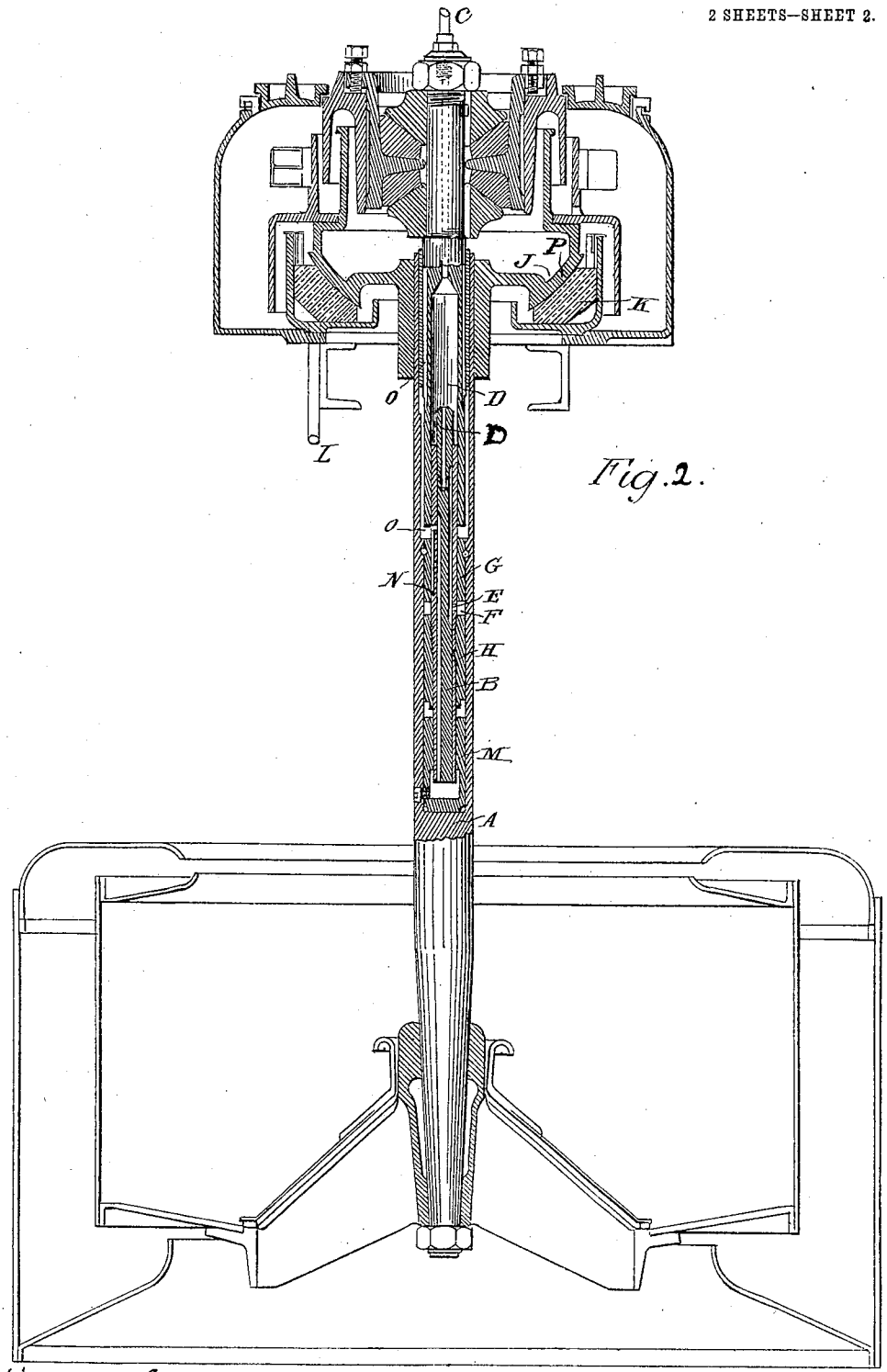

Fig. 2.

Witnesses: H. E. Manning.
A. Lewis.

Inventor: Andrew Freitag
By Wright Brown & Quinby
Attys

UNITED STATES PATENT OFFICE.

ANDREAS FREITAG, OF AMSTERDAM, NETHERLANDS, ASSIGNOR TO WATSON, LAIDLAW & COMPANY, OF GLASGOW, SCOTLAND.

CENTRIFUGAL MACHINE.

No. 813,963. Specification of Letters Patent. Patented Feb. 27, 1906.

Application filed January 8, 1902. Serial No. 88,866.

To all whom it may concern:

Be it known that I, ANDREAS FREITAG, factory manager, residing at 57 Spaarndamerstraat, Amsterdam, Netherlands, have invented a new and useful Improvement in Centrifugal Machines, of which the following is a specification.

This invention relates to the improvement of centrifugal machines or hydro-extractors whereby a fluid under suitable pressure is substituted for the ordinary footstep-bearing.

It is well known that the lubrication of the footstep-bearings of a certain class of centrifugal machines is augmented by forcing oil or other lubricating fluid under the revolving spindle, so as to remove or lessen the weight of the footstep or bearing. A possible defect of this arrangement is that in the event of the supply of oil failing the whole weight of the revolving parts would come in direct contact with the footstep-bearing, which would result in the abrasion of that part from want of lubrication. In order to remedy this defect, I construct the machine in such a manner that a supply of oil or other lubricating fluid is maintained in the footstep-bush at such a pressure as will support the whole of the revolving spindle, and thereby form a liquid footstep-bearing.

The combination of fluid-pressure footstep-bearing as described is applicable to all kinds of centrifugal machines irrespective of the method of driving, the word "footstep" being applicable to the spindle of both suspended and underdriven centrifugals whether they have rigid bearings, elastic or semi-elastic bearings, or self-balancing bearings.

In machines driven by fluid-pressure I may use the fluid which serves to drive the machine to support the spindle.

In order to make my invention more clear, reference will be had to the accompanying drawings, in which—

Figure 1 is an elevation, part in section, of my invention applied to a form of the suspended centrifugals of the Weston type; and Fig. 2 is a similar view of the invention as applied to another form of the same type of machines.

In these machines there is an outer revolving spindle A and a stationary spindle B within it, which carries the weight of the revolving spindle A, basket, and load. I make the inner spindle B hollow and force the lubricating fluid under pressure into the hollow spindle by the pipe C through the passage D D to the port E, and so into the chamber F. A cup M is secured to the inner wall of the outer spindle A at the base of the spindle B. Attached to the inner wall of the revolving spindle A there is a ring or bush G, and a similar ring or bush H is attached to the stationary spindle B. The pressure of the fluid in the chamber F acting on the ring or bush G raises the spindle A, with basket and load. The brake-surface J is attached to the spindle A and will be raised off the brake-surface K when the spindle rises, and the movable parts will be free to revolve. The brake-surface J is formed convex and the brake-surface K correspondingly concave, so as to allow for oscillation of the basket. In order to prevent the centrifugal from rising too high, I provide the port N, which is uncovered by the ring G when the spindle has risen to the desired height. The lubricating fluid escapes through the port N and the ducts O O, formed on the lower and upper ends of the spindle, into the chamber above the brake-surface J and through holes P onto the brake-surface K. It then escapes through the pipe L and returns to the pump.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is the following:

1. In a centrifugal machine, the combination of an outer revolving spindle, an inner axially-movable spindle, a bush on the inner wall of said outer spindle, a bush on the outer wall of said inner spindle, said inner spindle having a port discharging into the chamber formed between the two said bushes.

2. In a centrifugal machine, the combination of an outer revolving spindle, an inner axially-movable spindle, a bush rigidly secured to the inner wall of the revolving outer spindle, a bush rigidly secured to the outer wall of the inner stationary spindle, said inner spindle having a port for leading a fluid under pressure to the chamber formed between the two said bushes.

3. In a centrifugal machine, the combination of an outer revolving spindle, an inner axially-movable spindle, a ring on the inner wall of the outer spindle, a bush on the outer wall of the inner spindle, said ring and bush forming together with their respective spin-

dle-walls a chamber for receiving a fluid under pressure, said inner spindle having a duct for leading the fluid under pressure to the said chamber.

4. In a centrifugal machine, the combination of two concentric hollow spindles, and bushes on the adjacent walls of said spindles forming with the walls of their respective spindles a chamber for the reception of a fluid under pressure.

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

ANDREAS FREITAG.

Witnesses:
F. DIERHAUS,
L. GOBET.