(No Model.)

F. HUGERSHOFF.

CENTRIFUGAL MACHINE.

No. 599,422. Patented Feb. 22, 1898.

Fig. 2.

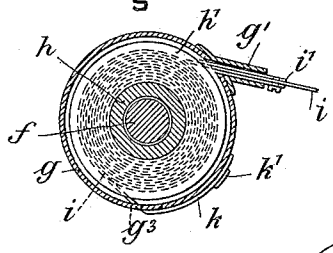


Fig. 1.

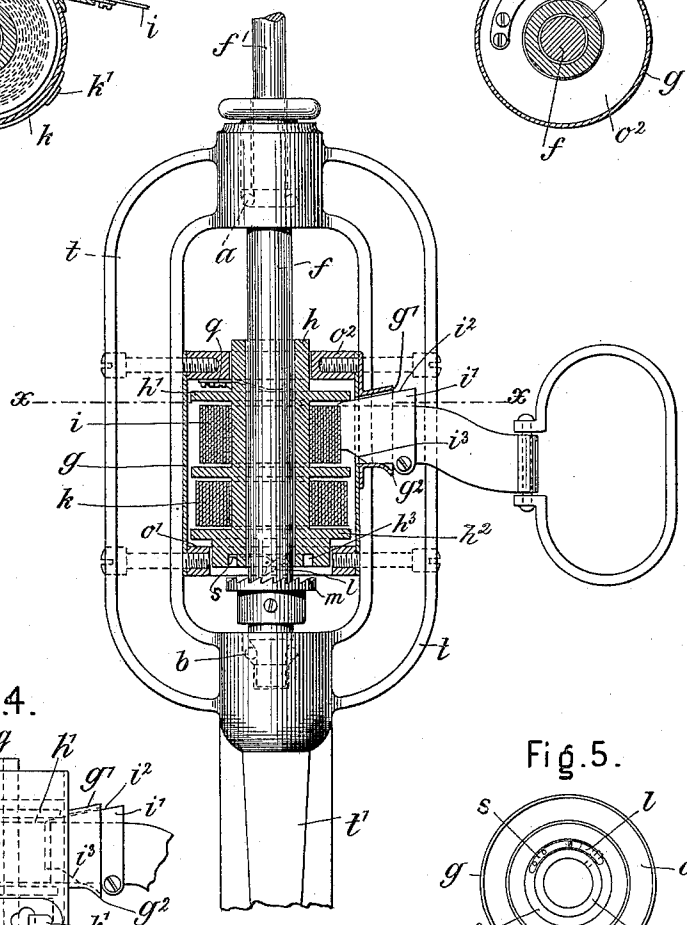


Fig. 3.

Fig. 4.

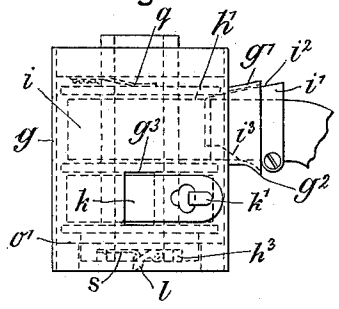


Fig. 5.

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UNITED STATES PATENT OFFICE.

FRANZ HUGERSHOFF, OF LEIPSIC, GERMANY.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,422, dated February 22, 1898.

Application filed August 2, 1897. Serial No. 646,748. (No model.) Patented in Germany July 23, 1894, No. 80,088, and in England October 16, 1894, No. 18,971.

To all whom it may concern:

Be it known that I, FRANZ HUGERSHOFF, a subject of the Emperor of Germany, residing at Leipsic, Germany, have invented certain new and useful Improvements in Centrifugal Machines, (for which I have obtained British Letters Patent No. 18,971, dated October 16, 1894, and German Letters Patent No. 80,088, dated July 23, 1894,) of which the following is a specification.

My invention has relation to centrifugal machines; and it relates particularly to driving mechanism for such machines.

The principal objects of my invention are, first, to provide a simple, durable, and efficient mechanism for actuating centrifugal machines, such as are employed for bacteriological investigations and for examinations of lacteal and other fluids; second, to provide a driving mechanism for such machines that in the actuation of the same means are brought into action for storing up energy to permit of a further hand manipulation of the mechanism to cause actuation of the machine for intended purposes, and, third, to provide a centrifugal machine with actuating means manually operated to not only cause a centrifugal action of the machine, but also a storage of energy sufficient to permit of the operation of the machine.

My present invention consists of the improvements in centrifugal machines hereinafter described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a view, partly in section and partly in elevation, of a driving mechanism embodying features of my present invention. Fig. 2 is a transverse section on the line $x\,x$ of Fig. 1. Fig. 3 is an elevational view of the under side of the top plate of the housing or frame for the driving-shaft. Fig. 4 is an elevational view of Fig. 1, and Fig. 5 is a similar view of the lower end of Fig. 4.

Referring to the drawings, t is a frame provided with a foot t', suitably forked at one end to allow of the connection of the same to a table, window-sill, or the like by means of a screw, clamp, or other preferred device. (Not shown.)

f is a vertical shaft located in the frame t and having, preferably, at its upper and lower portions ball-bearings a and b, as shown in Fig. 1. At the upper end f' of the shaft f is adapted to be secured a drum (not shown) for the reception of a lacteal fluid, urine, blood, sputum, or the like to be examined or for making bacteriological, chemical, or physiological research.

Within the frame t and secured thereto is a housing g.

h is a grooved roll mounted on the shaft f in such manner as to be afforded a range of vertical movement thereon, as clearly illustrated in Fig. 1. In the upper groove of the roll h is secured one end of a steel band, strap, or the like i, and in the lower groove of the said roll is mounted a spring k, one end of which is connected with the roll h and the other end is led through an opening g^3 and connected with a hook k' of the housing g, as clearly illustrated in Fig. 4.

l is a pawl controlled by a leaf-spring s, located in a circular groove h^3 at one end of the roll h, which in a certain position of the roll within the housing g meshes with a ratchet-wheel m, secured to the driving-shaft f, as clearly illustrated in Figs. 1 and 4.

o^2 is the top plate of the housing g, provided with an opening for the reception of one end of the roll h, and at the under side thereof is located a spring q, adapted to press the roll h, with its flange h^2, downward onto a ring o', which is secured to the other end of the housing g.

To raise the roll h and disengage the pawl l from the ratchet-wheel m, (illustrated in Fig. 1,) a strap i is employed and is provided with a wedge-shaped piece of metal i'. The housing g is provided with a funnel-shaped opening g', as clearly illustrated in Fig. 1. When the strap i is released and the wedge-shaped piece i', through the intervention of the spring k, is drawn inward in the housing g, the projection i^3 of the wedge-shaped piece i' will be brought into engagement with the grooved part g^2 of the opening g'. The slanting projection i^2 of the wedge-shaped piece i' will be brought into engagement with the

flange h' of the grooved roll h, so as to elevate the same, as clearly illustrated in Fig. 1. The pawl of the grooved roll h will be caused to disengage the ratchet-wheel m of the shaft f, and the roll h will thereby be automatically detached from the shaft f. By drawing outwardly the strap i the wedge-shaped piece i' will be disengaged from the opening g', and the grooved roll h will be allowed to move downward by its own weight, and the pawl l will thus be brought again into engagement with the ratchet-wheel m.

The mode of operation of the driving mechanism for a centrifugal machine as hereinbefore described is as follows: A drum (not shown) to be located at the upper end of the shaft f is filled with a fluid to be examined. The pawl l of the roll h is then brought into engagement with the ratchet-wheel m of the shaft f, and, the said roll h contacting with the rim o' by the pressure of the spring q against the same, the strap or steel spring i is then drawn at its free end outward and the roll h thereby set in rotation, which by means of the pawl l and the ratchet-wheel m is transferred to the shaft f and then to the drum rotated by the said shaft in one direction. The spring k, through said rotation, is simultaneously wound up. After the release of the strap or spring i the roll h is set in rotation in a reverse direction. The strap i will by this time be wound up again and ready to actuate said shaft in the manner hereinbefore described. By pulling the strap i the shaft f and also the drum, (not shown,) through the intervention of the spring k, will be set in rapid rotation in one direction until the examination of the liquid in the drum has been completed. The actuation of the pull or handle p will cause the roll h to be elevated and the pawl l to be disengaged from the ratchet-wheel m and the driving mechanism and drum hereinbefore explained brought to a standstill.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, of a revoluble shaft having a grooved roll mounted thereon, a strap with a wedge-shaped device, a spring connected with said roll, a pawl-and-ratchet connection between said shaft and roll and means controlled by the wedge-shaped device of said strap to disengage said roll from said shaft, substantially as and for the purposes set forth.

2. The combination, of a shaft provided with a roll controlled by a pawl-and-ratchet connection, a strap provided with a wedge-shaped device, a housing provided with an opening, a spring connected with said roll, and means controlled by said strap and its wedge-shaped device to actuate said shaft and to disengage said roll therefrom, substantially as and for the purposes set forth.

3. The combination, of a frame provided with a shaft, a grooved roll mounted on said shaft and having a band or strap and a leaf-spring connected therewith, a spring-actuated pawl-and-ratchet connection with said shaft, a wedge-shaped device adapted to release the roll from its connection with said shaft, a pull or handle, and a spring connected with said roll, substantially as and for the purposes set forth.

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

FRANZ HUGERSHOFF.

Witnesses:
RUDOLPH FRICKE,
BENNO HÖLLER.