(No Model.)

E. CAPITAINE.

PUMP FOR LIQUIDS.

No. 584,034. Patented June 8, 1897.

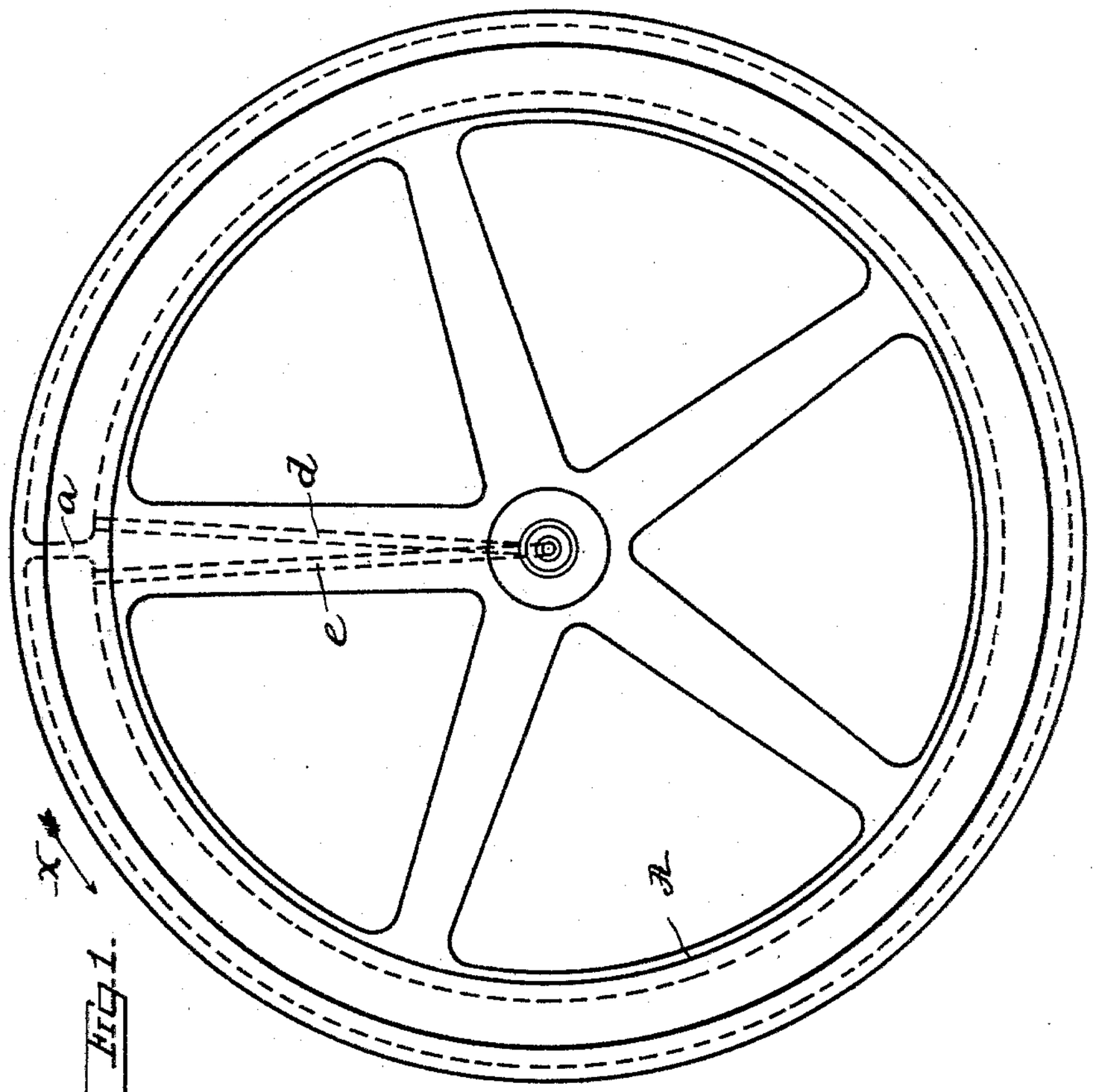

FIG. 1.

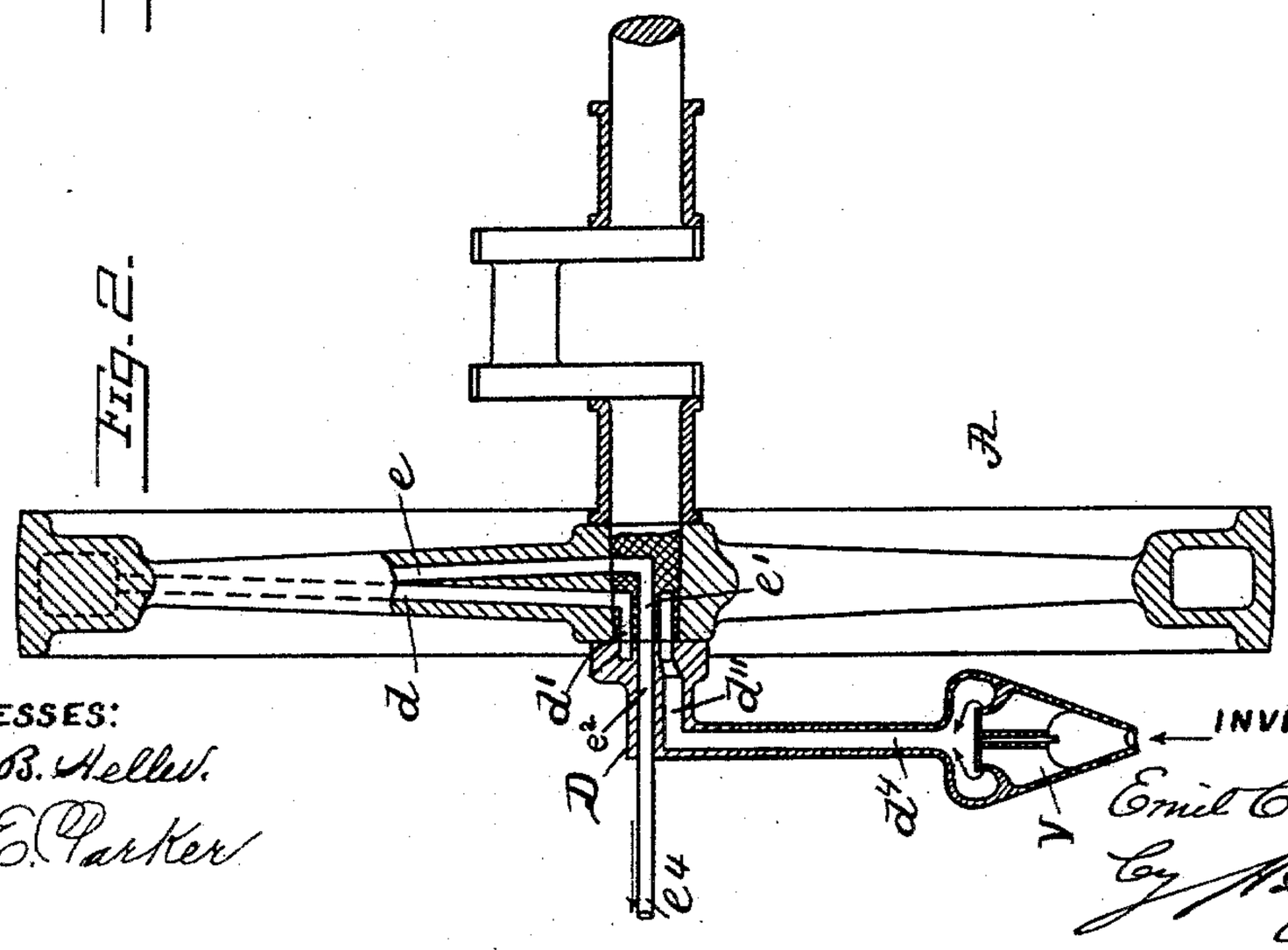

FIG. 2.

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EMIL CAPITAINE, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO GEORGE T. HARRIS, OF PHILADELPHIA, PENNSYLVANIA.

PUMP FOR LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 584,034, dated June 8, 1897.

Application filed November 7, 1896. Serial No. 611,326. (No model.)

To all whom it may concern:

Be it known that I, EMIL CAPITAINE, a citizen of the German Empire, residing at Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in a Pump for Liquids, of which the following is a specification.

My invention relates to devices for pumping liquids, applicable more particularly to gas or petroleum or other light engines, and has for its object to utilize the momentary but regularly occurring differences of speed of the periphery of the fly-wheel to move bodies of liquid by very simple mechanical devices, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of an engine fly-wheel, the dotted lines indicating the hollow interior thereof and a partition-wall in the rim thereof. Fig. 2 is a section thereof and of the crank-shaft and of feeding-in devices leading to the interior of the hollow fly-wheel.

The outer rim of the fly-wheel A is hollow, and the hollow annular space is divided by a partition *a*. From the hub of the fly-wheel a canal *d* leads to one side of *a* into the hollow annular space, and another canal *e* leads also from the hub to the other side of *a* into the hollow space. As will be seen by the drawings, the crank-shaft has an annular groove *d'* turned in its end, while a cylindrical hole *e'* is bored in the center of the shaft some distance deeper, and by holes drilled in the side of the shaft, respectively, into *d'* and *e'* these latter are set in communication with the canals *d* and *e*, respectively.

Against the crank-shaft the non-rotating body D is pressed with a sufficient spring-pressure to make a water-tight joint. This body D has canals d'' and e^2, which form continuations of canals *d'* and *e'*, respectively, so that a continuous connection is made between the non-rotating inlet-pipe d^4, through the canal *d'* and *d*, to the hollow space in the rim of the fly-wheel on one side of partition *a* and from the other side of *a* through canals *e* and *e'* to the outlet-pipe e^4.

The mode of operation is as follows: When the fly-wheel rotates in the direction shown by the arrow *x*, then by every power impulse from the piston acting through the crank-shaft an acceleration of speed in this direction follows. The inertia of the water or other liquid contained in the hollow rim and the inability of the fly-wheel instantly to communicate to it its accelerated speed occasions an overpressure on the left side of the wall *a* and an underpressure on the right side of *a*, and this pressure is greater or smaller according as the acceleration of the fly-wheel is greater or smaller, and it follows that the water in the hollow space of the rim under this pressure will be forced through the canals *e* and *e'* and out of the pipe e^4, and likewise will be sucked again through the pipe d^4 and canals *d'* and *d* into the rim of the fly-wheel. By the now following slowing down of the speed of the fly-wheel, (as a consequence of the load on the motor or as a consequence of the work lost in the motor itself, or by both together,) the water in the rim having in the meantime acquired part of the acceleration, it will for a moment, and before the next power impulse from the piston, possess a slightly higher velocity than the wheel, and the water would therefore rush back in the opposite direction to that described above, and to prevent this I place a check-valve V in the pipe d^4, as shown.

The degree of effect of this pump is of course dependent on the irregularity of speed of fly-wheel, and this again is dependent on the proportion of the rotating mass of the fly-wheel to the force of the power impulse, or otherwise also on the proportion of the mass of the fly-wheel to the rapidity of the periodically-occurring explosion. Therefore the application of this pump is more particularly adapted for circulating cooling-water in the motors for boats, for instance, where a comparatively small and light fly-wheel must of necessity be used, but it can also be used entirely for power-pumping in connection with a motor.

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

1. The combination with a rotating fly-wheel having within its rim an annular chamber formed with a partition-wall and also having canals or passages leading from opposite

sides of said wall through the spokes, to openings in the interior of the hub, a shaft upon which said wheel is mounted having openings or passages in its end registering with the orifices in the hub, a non-rotating body having inlet and discharge openings arranged to register with the respective passage-ways in the shaft and wheel-hub, and with means, such as a check-valve, to alternately open and close said inlet-port; substantially as described.

2. A fluid-pump comprising a rotating fly-wheel having a rim, a chamber in its rim, a spoke and hub with passages communicating respectively with opposite end portions of said chamber, a shaft having passages in its end registering with the passages in the wheel, a non-rotating body having inlet and outlet passages, and means to alternately open and close the inlet-passage, the said last-mentioned passages operating as inlet and discharge ways for liquid respectively sucked into and discharged from the wheel-rim recesses by means of the momentary but regularly occurring differences of speed in its rotation; substantially as described.

3. A rotary pump for liquids comprising a fly-wheel having an annular passage in its rim, said passage having a partition-wall across it, canals d and e in the spoke and hub leading to said annular passage, a shaft having passages d' and e' communicating therewith respectively, a non-rotating body D having canals d^2 and e^2 arranged to communicate with the respective passages in the shaft, and with inlet and discharge openings and means such as check-valve V operating to alternately open and close the inlet-opening; substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL CAPITAINE

Witnesses:
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