No. 879,484. PATENTED FEB. 18, 1908.

E. MORTERUD.

PUMP FOR CORROSIVE FLUIDS.

APPLICATION FILED SEPT. 3, 1907.

Fig. 2.

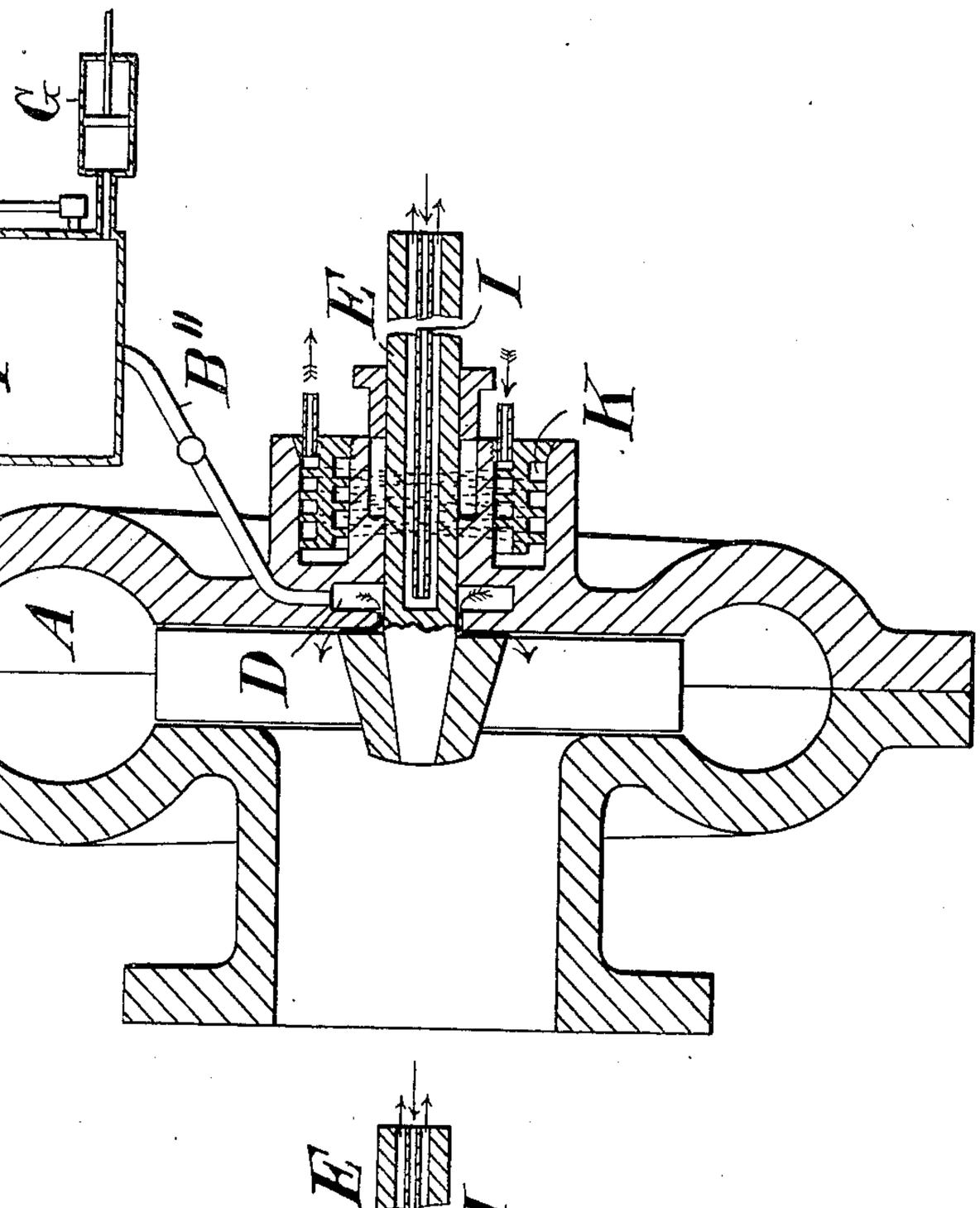
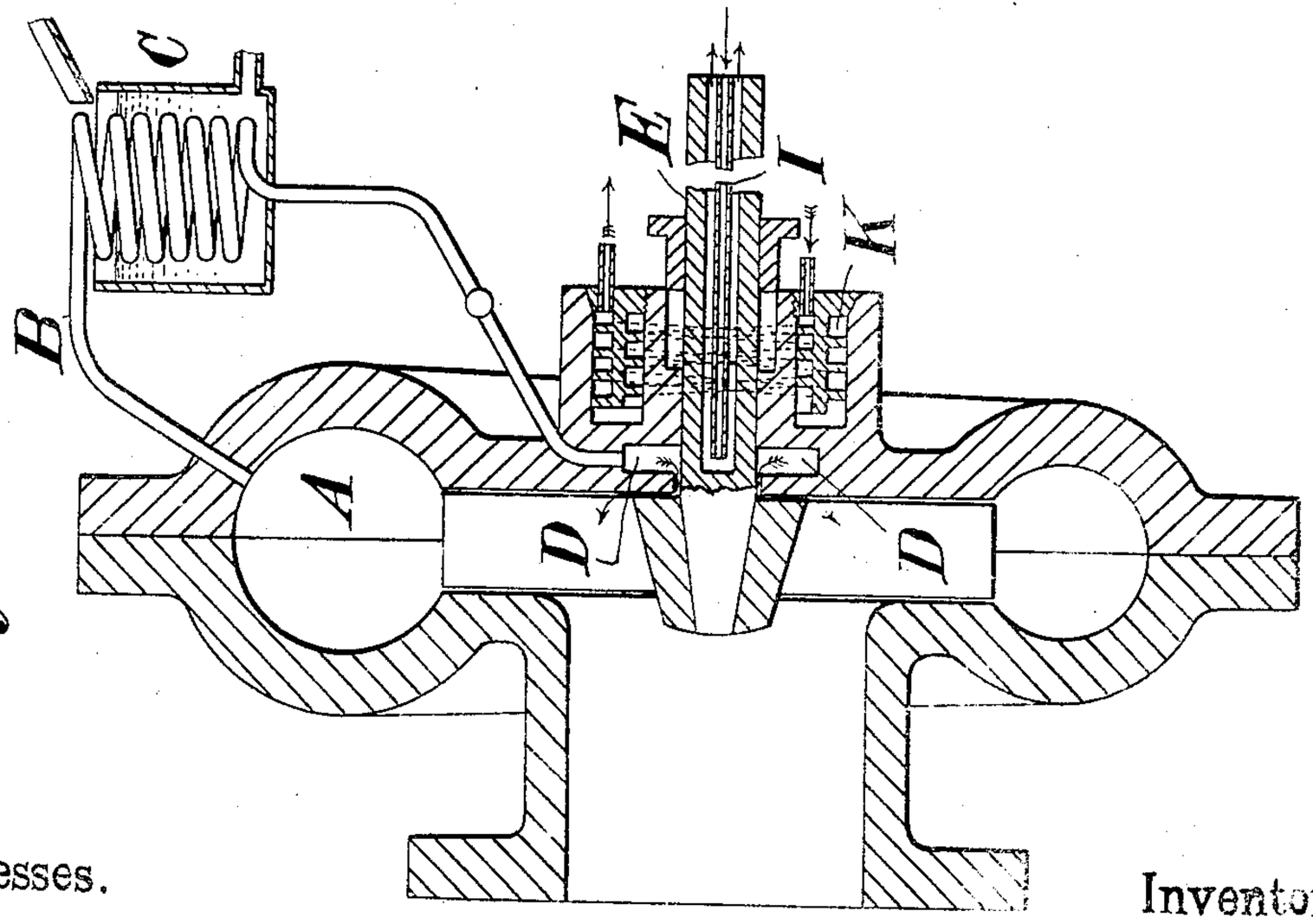


Fig. 1.



Witnesses.

Jesse K. Sutton.

B. Dommers

Inventor.

Einar Morterud

by Henry Orth Jr.

UNITED STATES PATENT OFFICE.

EINAR MORTERUD, OF TORDERÓD, NEAR MOSS, NORWAY.

PUMP FOR CORROSIVE FLUIDS.

No. 879,484. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed September 3, 1907. Serial No. 391,116.

To all whom it may concern:

Be it known that I, EINAR MORTERUD, a subject of the King of Norway, residing at Torderód, near Moss, Norway, have invented certain new and useful Improvements in Pumps for Corrosive Liquids; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to pumps for corrosive liquids and consists in means for preventing the destructive action of such liquids on the pump shaft and packing box.

It is a well known fact that the pumping of a corrosive fluid is connected with great difficulties, the pump shaft being corroded at the point, where it extends through the box into the pump case to engage the wheel. By the present invention this is avoided in the following manner: The packing box is constructed in such a way, that a non-corrosive fluid is pressed in around the shaft and out around the same through the shaft hole, in the pump wall and then between the pump wall and the wheel. The necessary pressure may most suitably be imparted to the said fluid by putting it into direct pressure connection with the pressure side of the pump by means of which pressure it may be caused to pass around the shaft. If the corrosive fluid is warm, and of such a nature that its corrosive action is not, in cold condition, of any importance, it may be arranged so as to utilize such fluid in cold condition to protect the shaft against the corrosive effect of the warm fluid. This is attained simply by taking out the "protecting fluid" from the pressure side of the pump and cooling it in some way or other, whereupon it is passed in in cold condition to the shaft.

In the accompanying drawing, Figure 1 is an axial section of a pump embodying my invention, and Fig. 2 is a similar view showing a modification.

From the pressure chamber A of the pump a pipe B is passed through a cooling device C to an annular chamber D around the shaft. From this latter chamber the cold fluid is pressed inward against the hub of the wheel and then mixes with the warm fluid.

If a fluid is used which is also corrosive in cold state, a special "protecting fluid" is made use of, for instance water or the pumping fluid may be used in neutralized state. The protecting fluid may then either be passed in around the shaft by means of a separate pressure source, or it may by pressure from the pressure side of the pump be conducted from a supply tank to the shaft. In Fig. 2 of the drawing is shown means to press water or other neutral fluid into the chamber D. The pipe B′ is then carried to the bottom of a receiver F, that has, for instance by a pump G, been filled with water, before starting the whole apparatus. The pump G may of course either continuously or discontinuously supply the receiver F with water during the operation. Between the water and the inlet of the pipe B′ may be disposed a piston H. The pressure through the pipe B′ now causes the water to be pressed in through the pipe B″. If an additional protection of the packing box, and particularly of the packing material in the same, is desired, the box may, as shown in the drawing, be cooled by making it hollow and conducting a stream of water through a circulation passage K arranged in the box. Hereby is attained to keep the vital part still colder in cases, where the same fluid is utilized as protecting fluid, that is to say where the heat produces the corrosive effect. The shaft is likewise made hollow and provided with a pipe I through which a cooling medium (water) is pressed into the bottom of the boring and is discharged between the pipe and the boring of the shaft.

Claims:

1. In pumps for corrosive fluids, an annular space surrounding the shaft near the pump wheel, a conduit leading to this space and carrying a noncorrosive fluid, and means whereby the pressure on the pressure side of the pump is transmitted to said conduit.

2. In pumps for corrosive fluids an annu-

lar space surrounding the shaft near the pump wheel, a conduit connecting the pressure side of the pump with said space and means connected with said conduit for depriving the fluid of its corrosive nature.

3. In pumps for corrosive fluids an annular space surrounding the shaft near the pump wheel, a conduit connecting the pressure side of the pump with said space and means for cooling the fluid passing through said conduit.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EINAR MORTERUD.

Witnesses:

HENRY BORDEWICH,

MICHAEL ALGER.