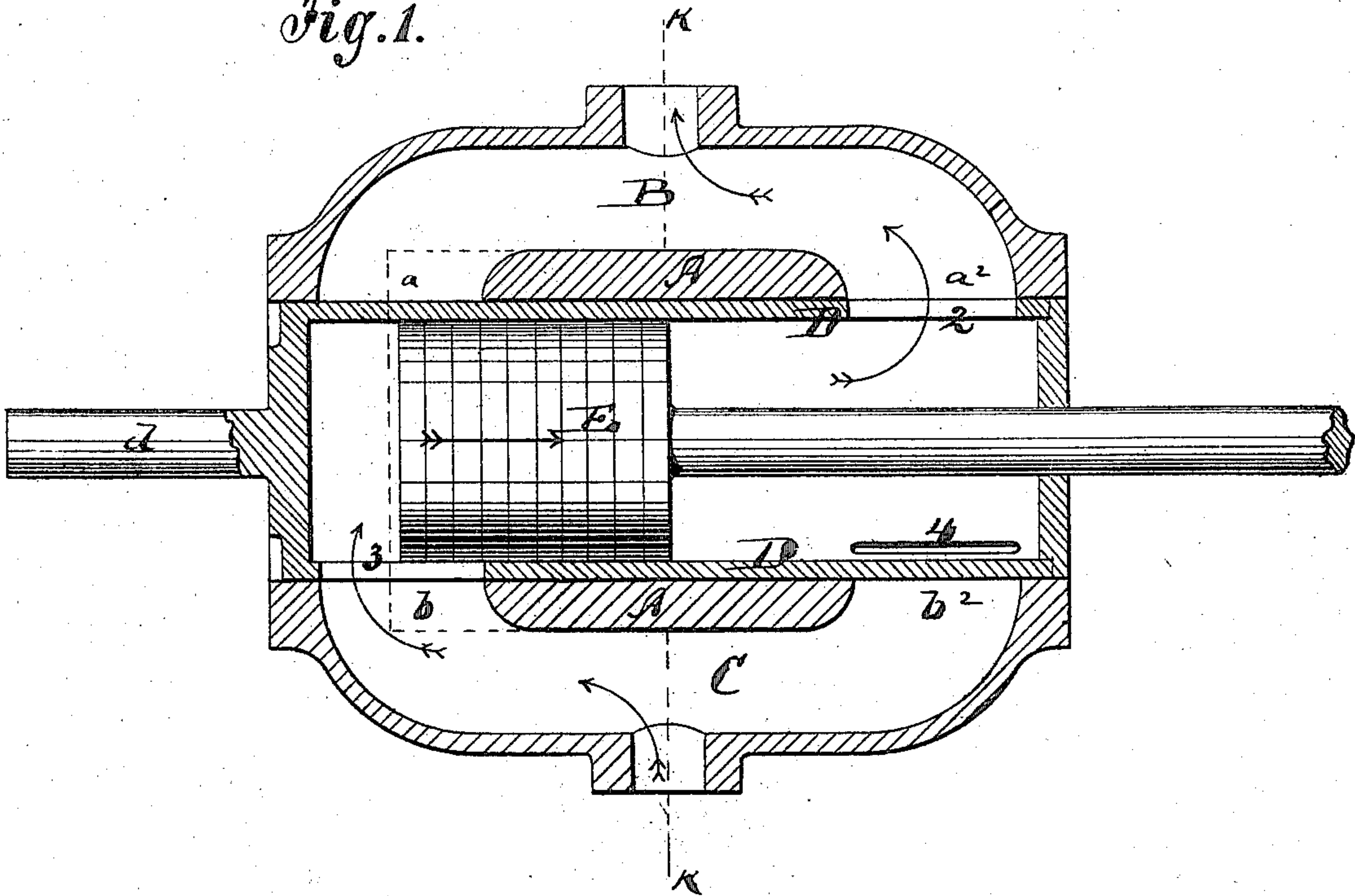


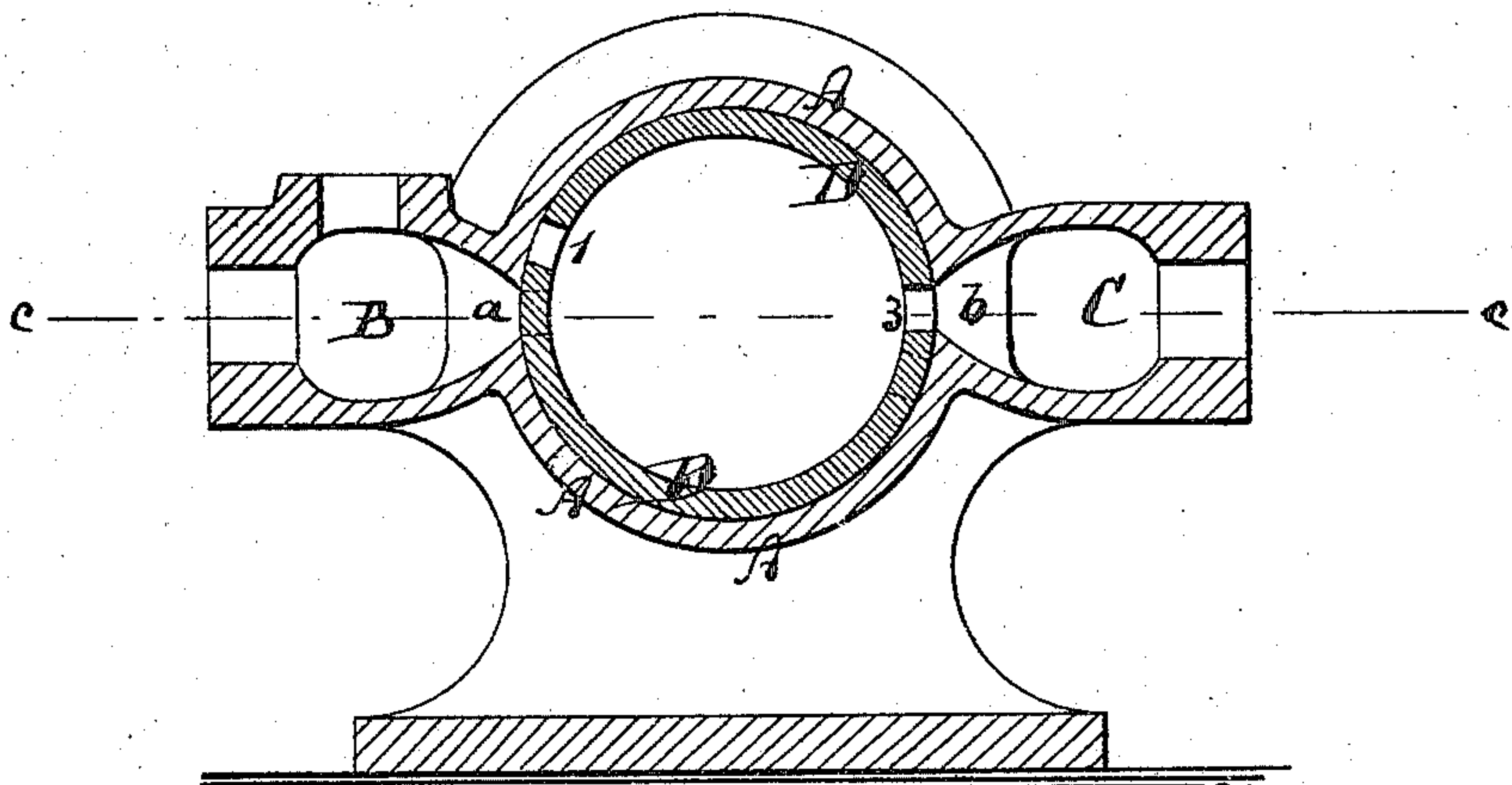
## Steam-Pumps.

Patented Dec. 31, 1872.

*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

JOHN NORTH, OF NEW YORK, N. Y.

## IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 134,481, dated December 31, 1872.

*To all whom it may concern:*

Be it known that I, JOHN NORTH, of the city, county and State of New York, have invented a new and Improved Pump, of which the following is a specification:

Figure 1 represents a longitudinal horizontal section of my improved pump, the line C C, Fig. 2, indicating the plane of section. Fig. 2 is a vertical transverse section of the same on the line K K, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention has for its object to dispense with the valve arrangements now used in reciprocating pumps; and consists in the use of a perforated cylinder placed within the pump-cylinder, but embracing the plunger, and vibrated to bring its apertures in line with the several ports in the requisite succession.

A in the drawing represents the pump-cylinder.  $a$   $a^2$  are the outlet-ports;  $b$  and  $b^2$ , the inlet-ports of the same, leading, respectively, from the inlet-pipe B and to the outlet-pipe C. D is a cylindrical shell fitted into the cylinder A and connected at its projecting stem  $d$ , or at any other convenient place, with suitable mechanism for rocking it within A. The cylinder D has four slots cut through it, of which two, diagonally opposite each other, can be in line with two of the ports. Thus,

in Fig. 1, the slots 2 and 3 of the cylinder D are shown to be in line with the ports  $a^2$  and  $b$ , respectively. The remaining two ports are meanwhile closed by the cylinder D. When the cylinder is rocked its slots 1 and 4 will come in line with the ports  $a$  and  $b^2$ , respectively, opening the same, while the ports  $a^2$  and  $b$  will be closed. The cylinder D serves thus as a convenient and a simple substitute for the usually-complex valve mechanism of pumps, and is not liable to get out of order. E is the pump-plunger, reciprocating within the cylinder D and properly packed to fit tight therein. Its motions are so proportioned to the vibrations of the cylinder D that at or near the end of each stroke of E the said cylinder is rocked to reverse the arrangement of ports, and thereby effect the requisite reversion of the plunger.

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

The cylinder D having ports 1 2 3 4, combined with the piston E, the one rocking and the other reciprocating within the pump A, arranged as and for the purpose specified.

JOHN NORTH.

Witnesses:

A. V. BRIESEN,  
ALEX. F. ROBERTS.