No. 868,362. PATENTED OCT. 15, 1907.

E. D. PRIEST.

MOTOR DRIVEN PUMP.

APPLICATION FILED FEB. 15, 1905.

2 SHEETS—SHEET 1.

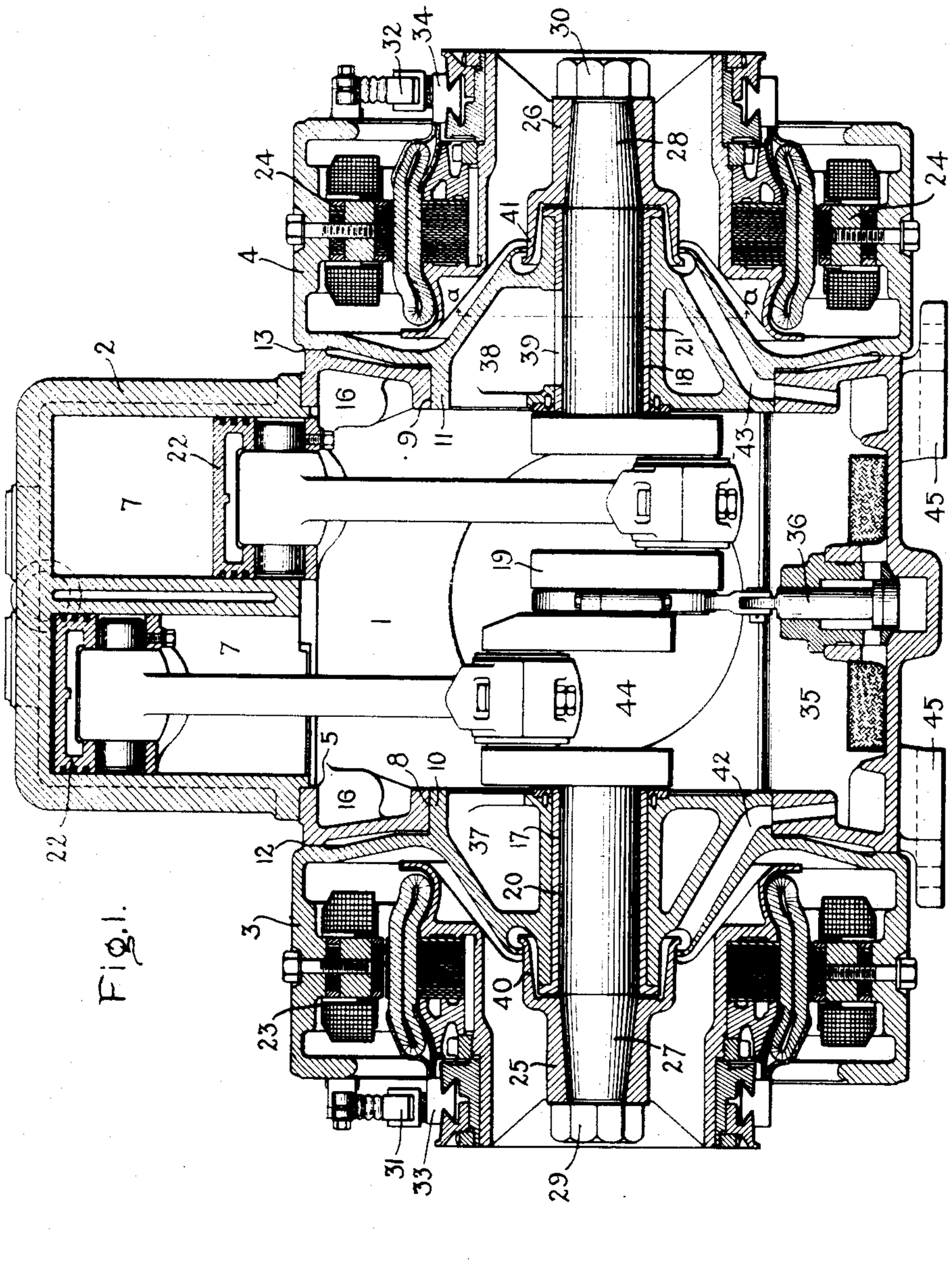

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

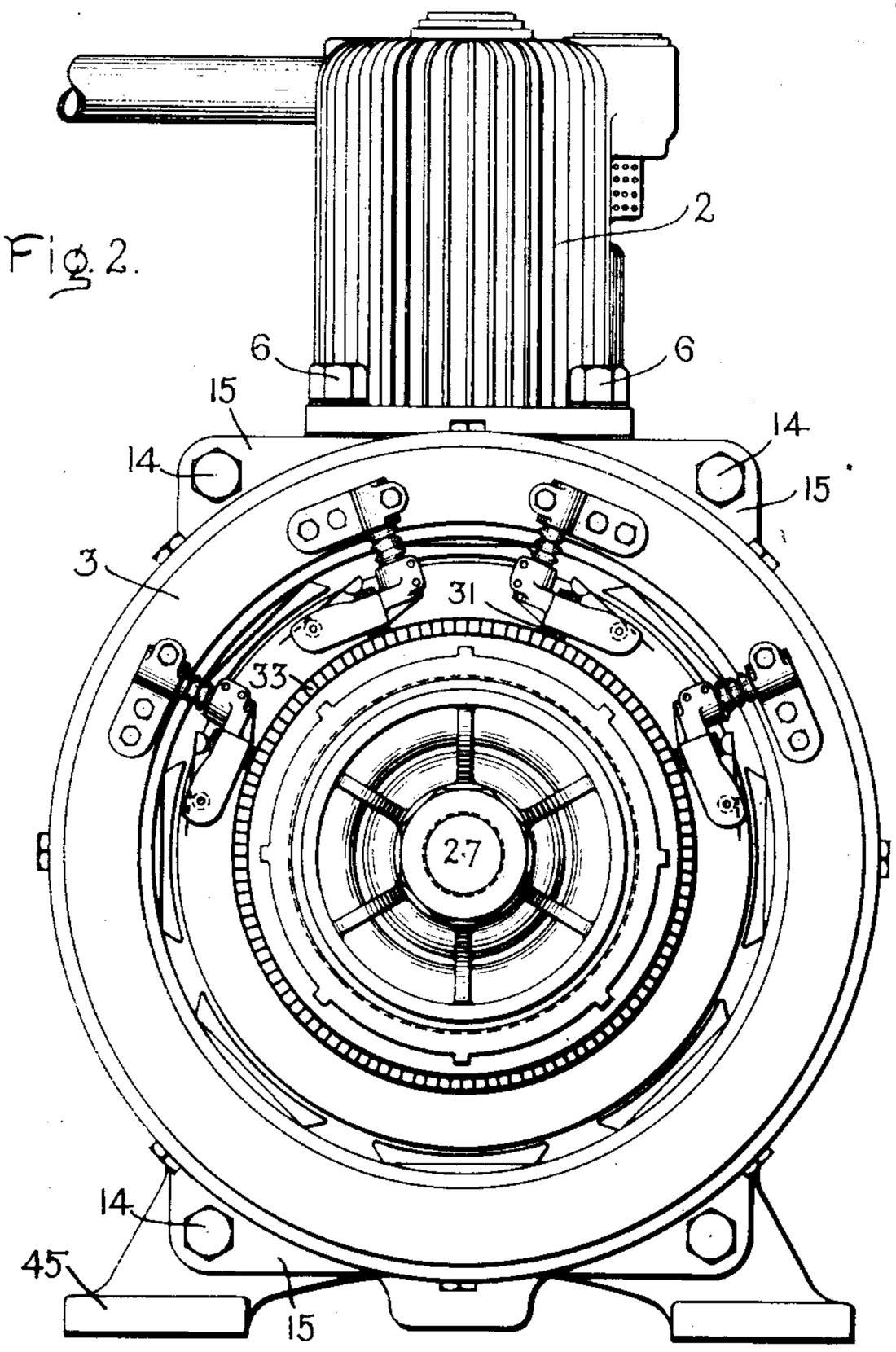
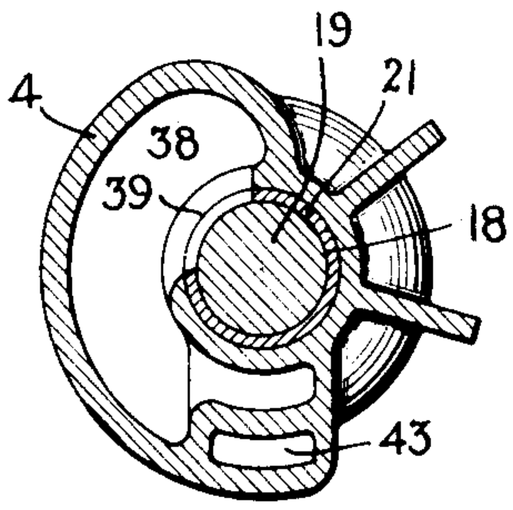


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD D. PRIEST, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MOTOR-DRIVEN PUMP.

No. 868,362. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed February 15, 1905. Serial No. 245,649.

To all whom it may concern:

Be it known that I, EDWARD D. PRIEST, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Motor-Driven Pumps, of which the following is a specification.

The present invention relates to motor-driven pumps or air compressors and has for its object an arrangement of parts providing a high capacity in a simple and compact construction and with a balancing effect such that the operation is smooth and efficient.

In large compressors it is difficult to so construct the motor-driven pump that the operating parts are balanced and at the same time confined within a minimum space.

Pursuant to the object of the present invention I have provided a main central frame within which the pump parts are arranged, together with a pair of motors arranged on opposite sides of the main frame and having their armatures or rotors mounted directly upon the pump shaft. In this way a perfect balancing, both of the operating parts and of the supporting frames, is secured, and the whole is simple in construction and occupies a minimum of space.

The present invention consists further in certain details of construction to be hereinafter described and particularly pointed out in the claims.

The present invention is illustrated in the accompanying drawings, in which

Figure 1 is a central cross-section through the axis of a motor-driven air compressor; Fig. 2 is an end elevation of the compressor; and Fig. 3 is a cross-section on line *a a*, Fig. 1, showing a detail.

Similar reference characters will be used throughout the specification and drawings to indicate like parts.

The frame of the compressor consists of a central portion or main frame 1, which is preferably formed of an integral casting, as shown; a cylinder frame 2, which is preferably separate from the main frame and bolted or otherwise secured thereto; and the supplementary motor frames 3 and 4 arranged on opposite sides of the main frame and secured thereto. The entire frame structure therefore consists of a few simple castings, two of which, 3 and 4, may be interchangeable; the several members may be readily handled and finished; and the several parts may be assembled with ease. The cylinder frame is open at its inner end and the main frame 1 is provided with a registering opening 5, so that when the cylinder frame is secured in position, as by means of bolts 6, the cylinder or cylinders 7 communicate directly with the chamber within the main frame. The sides of the main frame are provided with bearing seats 8 and 9, which are preferably cylindrical although they may of course have any other desired or preferred shape; these seats being adapted to receive hubs 10 and 11 projecting respectively from the motor frames 3 and 4. The meeting faces of the main frame and the frames 3 and 4 are preferably finished as at 12 and 13 to form with the bearings 8 and 9 and bosses 10 and 11 a rigid support for the motor frames. The frames 3 and 4 are secured to the main frame by means of bolts 14 which pass through flanges 15 upon the motor frames and into bosses 16 on the main frame. When the parts are assembled, the frames 1, 3 and 4 are, to all intents and purposes, one integral structure which may, however, be readily segregated into its several component parts and as readily assembled again. The frames 3 and 4 may be open at their outer ends but are provided with inner walls having bearings 17 and 18, respectively, within which is seated the pump shaft 19, which may consist of a single or double crank shaft. The bearings 17 and 18 may be of any construction having preferably, however, sleeves 20, 21 which are interposed between the shaft on the seats within the frame walls for the purpose of taking the wear. Two pump cylinders are preferably employed, as illustrated, in order that two pistons 22 may be utilized and so arranged that one operates a half stroke in advance of the other, making the load upon motors more uniform than if but a single piston were used.

The frames 3 and 4 serve as magnetic field frames or rings of the two motors and are respectively provided with poles 23 and 24 of any suitable construction. Eight poles are shown within each field ring but the number of poles as well as the particular construction of the entire motors is immaterial in so far as the present invention is concerned. The spiders of the motor armatures are secured to the ends of the shaft 19 by means of sleeves 25 and 26, and, by making the ends 27 and 28 of the shaft 19 tapering, and tapering the interior of the sleeves 25 and 26 correspondingly, the armatures may be forced upon the ends of the shaft and held perfectly secure by means of nuts or similar fastening means 29 and 30. The brushes 31 and 32 may be suitably supported on the frames 3 and 4 in operative relation to the commutators 33 and 34.

The lower portion of the main frame 1 contains an oil chamber 35 within which oil may be poured and subsequently pumped to the working parts of the machine by means of pump mechanism 36 operated from the main shaft. Chambers 37 and 38 are formed within the inner walls of the frames 3 and 4 and adjacent to the bearings 17 and 18, and portions of the bearings 17 and 18 are removed, as shown at 39, in order to leave portions of the crank shaft 19 exposed. The chambers 37 and 38 may be packed with waste or other suitable

means for holding oil or other lubricant, and the lubricant will be delivered therefrom to bearings 17 and 18 through the openings 39. In order to prevent the oil or other lubricant from coming in contact with the armature, the sleeves 25 and 26 are provided with extended flanges 40 and 41 which project inwardly and surround the ends of the bearings 17 and 18. The lubricant as it emerges from the bearings 17 and 18 on the inner sides drops into well or chamber 35, while that which emerges from the outer ends of the bearings is caught by the deflecting sleeves 40 and 41 and is caused to flow back into the chamber 35 through suitable passages 42 and 43 located within the frames 3 and 4, or within the frames 3 and 4 and the main frame 1. One or more doors 44 may be provided in the walls of the main frame through which the pump mechanism may be examined, the main bearings 17 and 18 packed and inspected, and oil supplied to the well 35. Feet 45 are provided on the main frame for supporting the pump in upright position.

Although I have disclosed the present invention as embodied in but one form I do not desire to limit the invention to the particular details of construction of the form shown and described, except as particularly specified in the claims, since in its broader aspects the present invention may be embodied in various other forms.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a motor-driven pump, a main frame, supplementary frames attached to and supported by opposite sides of said main frame, a crank shaft extending through said main frame, bearings in said supplementary frames for supporting said shaft, field magnets supported by said supplementary frames, and motor armatures mounted on opposite ends of said pump shaft in operative relation to the field magnets.

2. In a motor-driven pump, a main frame, a cylinder frame supported thereby, supplementary frames attached to and supported by opposite sides of said main frame, bearings in said supplementary frame, a crank shaft supported in said bearings, field magnets supported by said supplementary frames, and motor armatures mounted on each end of said shaft in operative relation to said field magnets.

3. In a motor pump, a pump frame having an oil chamber, a motor frame seated in a bearing in said pump frame, a bearing in said motor frame, a pump shaft seated in said latter bearing, an armature on said shaft, and a deflecting plate between said latter bearing and the armatures for deflecting oil from the bearing to a passage leading to said oil chamber.

4. In a motor-driven pump, a pump frame having seats in opposed sides thereof, field magnets secured in said seats, a bearing associated with each of said field magnets, a pump shaft seated in and having its ends projecting beyond said bearings, and motor armatures mounted upon the ends of said shaft and partially surrounding said bearings.

5. In a motor-driven pump, a frame comprising a main portion and a cylinder portion secured thereto and supplementary frames secured to and supported by opposite sides of said main portion, a bearing in each of said supplementary frames, a crank shaft supported in said bearings, field magnets supported by each of said supplementary frames, and motor armatures supported on the ends of said shaft beyond said bearings in operative relation to said field magnets.

In witness whereof I have hereunto set my hand this 13th day of February, 1905.

EDWARD D. PRIEST.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.