2 Sheets—Sheet 1.

R. H. TUCKER.

Pneumatic Propulsion of Canal-Boats.

No. 227,323. **Patented May 4, 1880.**

Fig. 1.

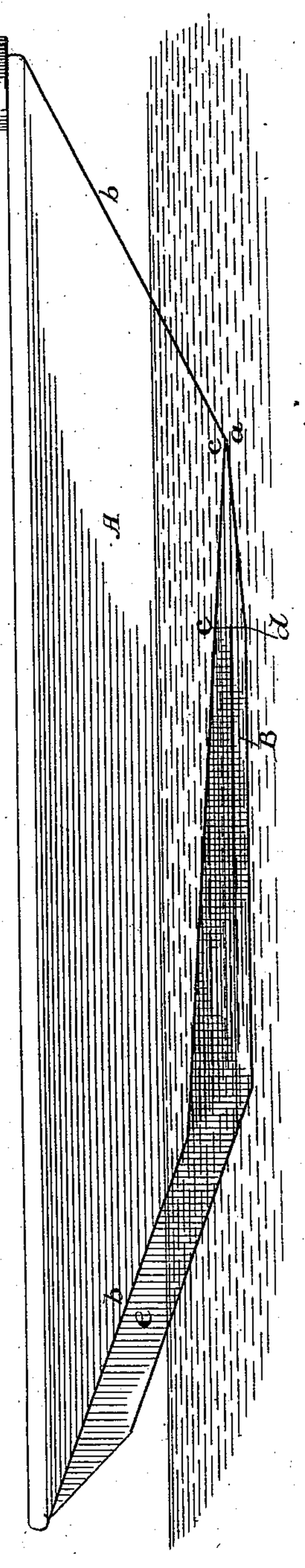


Fig. 2.

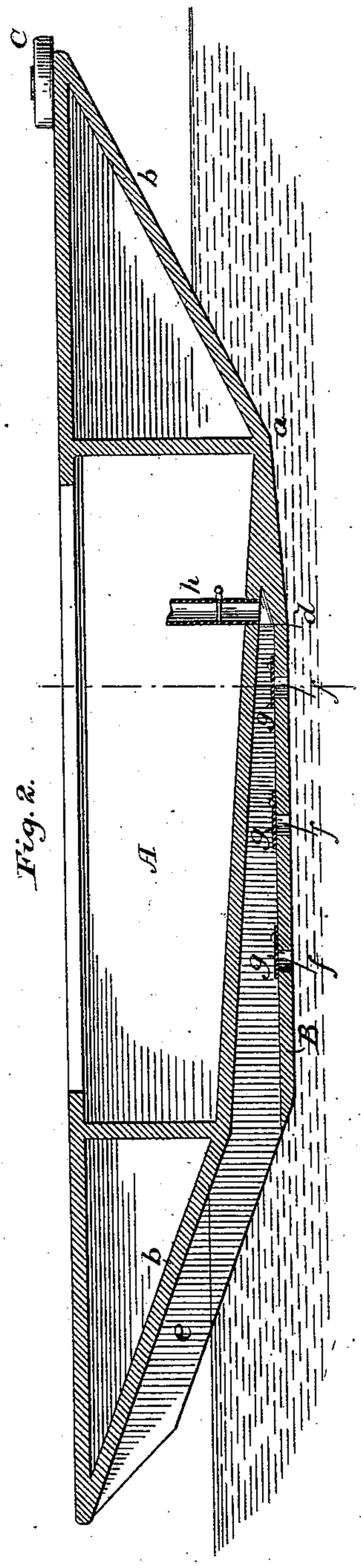
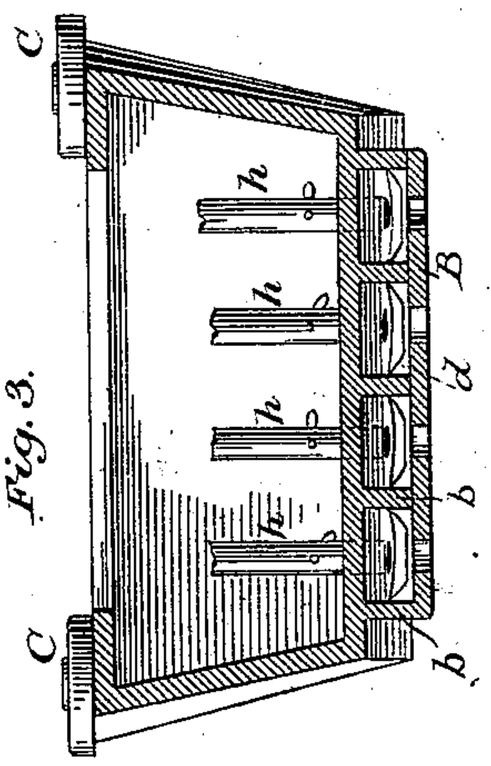


Fig. 3.



Witnesses:

C. Clarence Poole

Warren Seely.

Inventor:

Richard H. Tucker

by Ellis Spear

2 Sheets—Sheet 2.

R. H. TUCKER.

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Fig. 4.

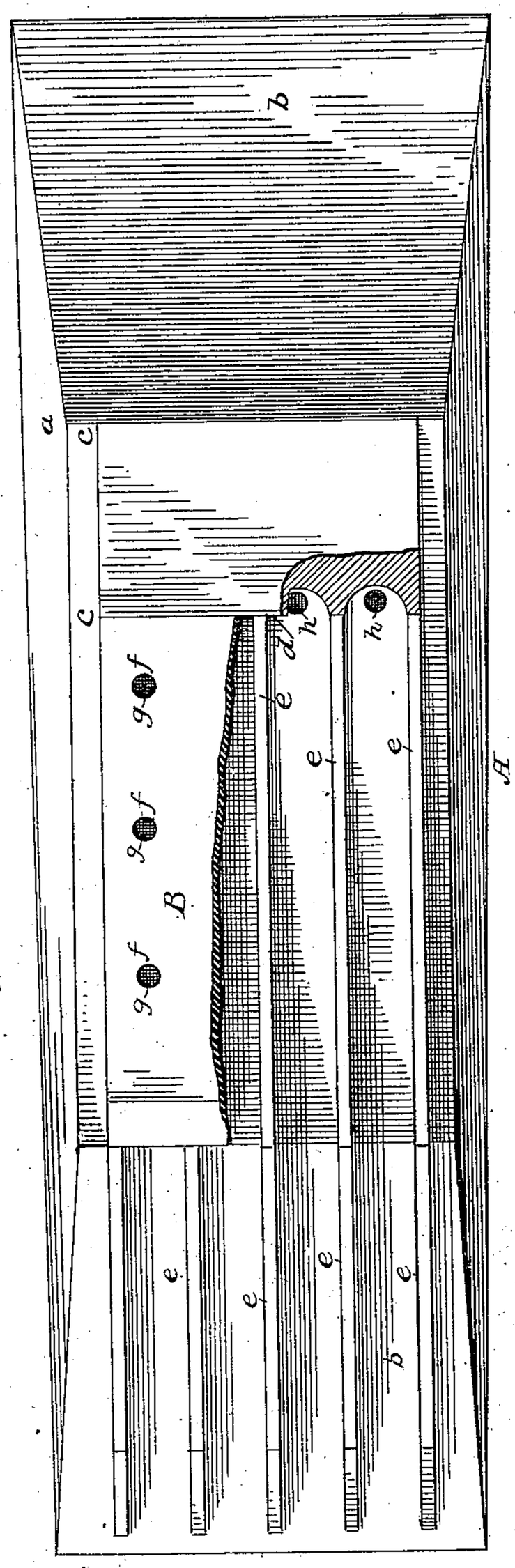
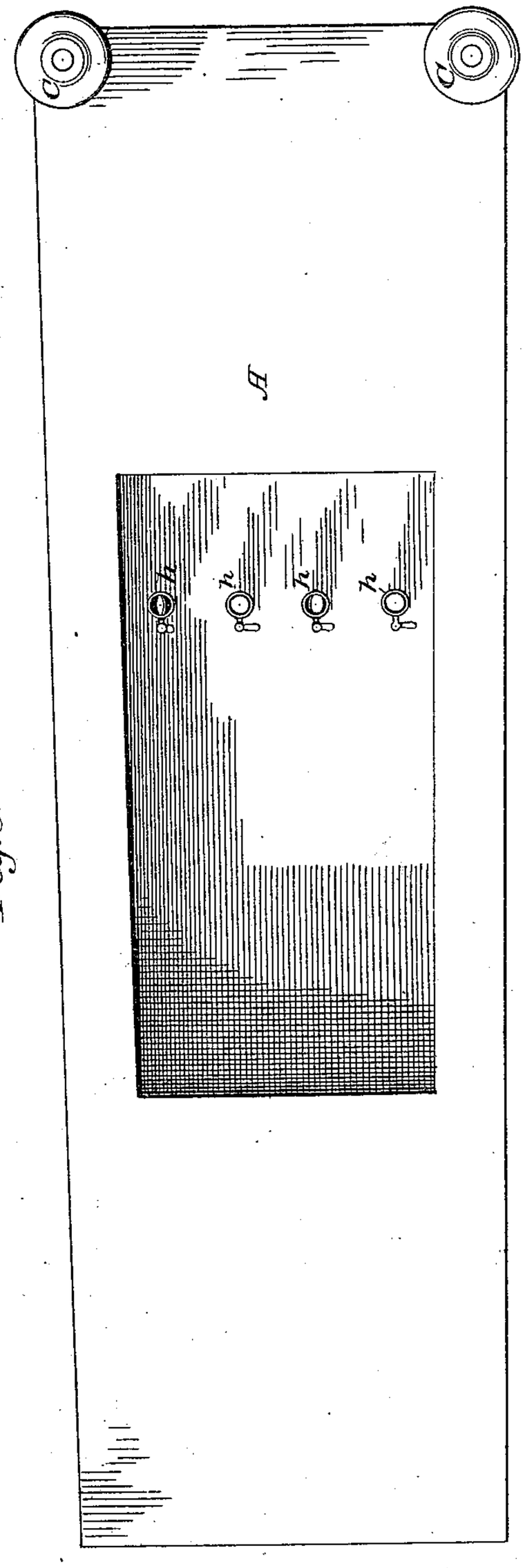


Fig. 5.



Witnesses:
C. Clarence Poole
Warren Seely.

Inventor:
Richard H. Tucker
by Ellis Spear
Attorney

UNITED STATES PATENT OFFICE.

RICHARD H. TUCKER, OF NEW YORK, N. Y.

PNEUMATIC PROPULSION OF CANAL-BOATS.

SPECIFICATION forming part of Letters Patent No. 227,323, dated May 4, 1880.

Application filed January 5, 1880.

To all whom it may concern:

Be it known that I, RICHARD H. TUCKER, of New York, in the county of New York, and State of New York, have invented a new and useful Improvement in Pneumatic Propulsion of Canal-Boats; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to canal-boats; and it consists in applying to such boats the mode of propulsion shown in patents granted to me on the 27th day of May, 1879.

The object of my invention is to secure a simple, economical, and efficient application of power with the minimum of friction to the propulsion of boats upon canals, with the least possible disturbance of the water and consequent wash of the banks.

The need of a mode of propulsion which should take the place of the slow, clumsy, and expensive mode of dragging the boat by mule or horse power has long been felt; but the devices sought to be substituted for the old and common mode have generally been found to be expensive or complicated or calculated to wash the banks.

My invention is an adaptation of the mode of propulsion shown in my said patents, whereby compressed air may be directly applied to the water to expend its whole force in driving the boat without appreciable disturbance of the water or wash of the banks.

In the drawings hereunto attached, I have shown, in connection with an improved form of canal-boat, a special arrangement of keels, valves, and air-passages, specially adapted to the peculiar requirements of a boat to be used on canals.

In these drawings, Figure 1 represents a side elevation of the boat; Fig. 2, a central longitudinal section of the same; Fig. 3, a transverse section on line *x x*; Fig. 4, a bottom view with the outer covering removed; Fig. 5 is a top view.

The general form of the boat with rectangular deck, slightly-sloping sides, and sloping ends, I have found specially desirable for a boat to be used upon canals. Such a form of boat, when light, moves with the least possible displacement of the water and with the least possible resistance or disturbance; and, as is hereinafter explained, is best adapted to my mode of propulsion.

In the drawings, A represents the hull. The bottom of this hull slopes upward from bow to stern on the line *a*, and both bow and stern are formed sloping, as shown at *b b*.

Between the points *c c* is formed a solid portion, extending across the entire bottom, triangular in longitudinal section, its vertical face *d* being toward the stern of the boat. This vertical face is perforated to admit the air at points between the keels *e*. These keels may be of any convenient number, and the air operates, in connection with them, in the same manner as shown in my former patents, heretofore referred to. The bottom line of the keels is preferably parallel with the top of the boat, and as the bottom slopes, as shown on the line *a*, the depth of the channels between the keels increases toward the stern. The keels are continued in right lines up the slope of the stern to a point at or above that of greatest submergence. This construction affords long passages in which the air can act expansively against the water.

The horizontal portion of the keels is covered by a planking, B, which closes the horizontal portion of the channels toward the bottom, leaving only openings toward the stern for the discharge of the air and water. In order to supply water to the channels thus closed, and to prevent any back-action of the water between the impulses of the air, openings *f f* are provided in the bottom, covered by valves *g g*, opening inwardly. In the intervals between the impulses of the air which is forced into the channels these valves may open to admit the water to said channels, such valves being closed whenever the pressure of the air becomes greater than that of the water on the outside.

The action of the air upon the water in the channels has been described in my said patents, and needs no further explanation here.

The openings in the vertical face *d* may, if deemed desirable, be connected directly to pipes *h h*, which lead to the air-compressor, or said pipes may open directly into an air-chamber.

I have also contemplated forming an air-

tight chamber in the forward and sloping part of the boat, in which compressed air may be stored up.

The pipes *h h* may be provided with independent stop-cocks to regulate the flow of air in each for the purpose of steering. Manifestly any known form of air-forcing apparatus may be used in this connection. As the square corners in the form of boat used by me are liable to come into collision with the sides of locks or with other boats, I have provided small disks or wheels, as shown at C C, projecting slightly over the corners, so as to receive the force of the blow and parry it by turning on the pivot.

It is manifest that the air-propelling apparatus may be duplicated upon the boat if it be found desirable, so that the boat may be propelled in either direction without turning.

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

1. In combination with the keels *e*, and with the air-pipes and the openings between the keels, the covering B, provided with openings and valves, as set forth.

2. A boat having its bottom inclined from bow to stern, and provided with air-pipes *h*, in combination with a triangular chamber, *d*, provided with openings to admit air under pressure between the keels, substantially as and for the purpose set forth.

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

RICHARD H. TUCKER.

Witnesses:
WARREN SEELY,
FRANK MIDDLETON.