

(No Model.)

J. F. BATCHELOR.
Vacuum and Air Brakes.

No. 231,258.

Patented Aug. 17, 1880.

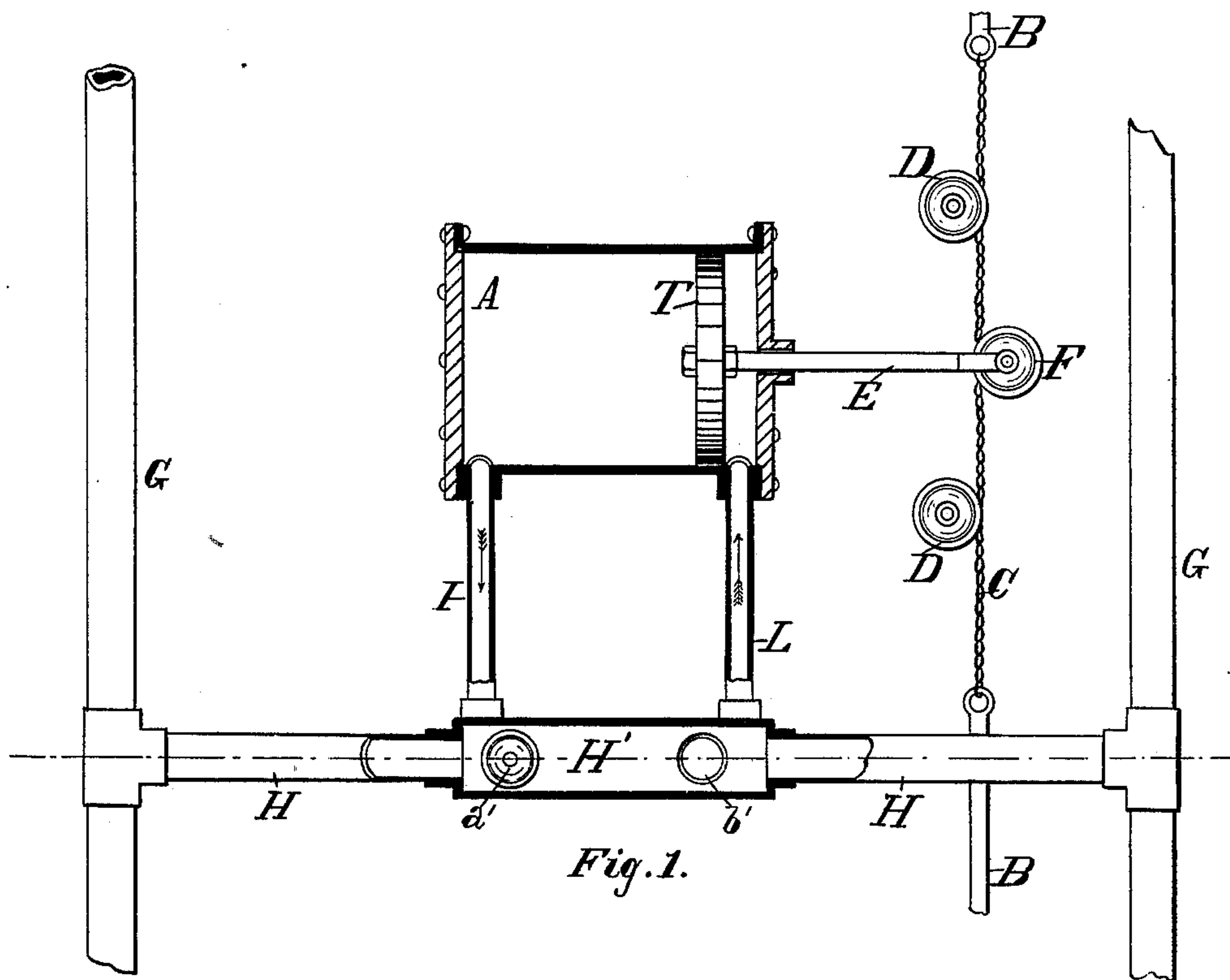


Fig. 1.

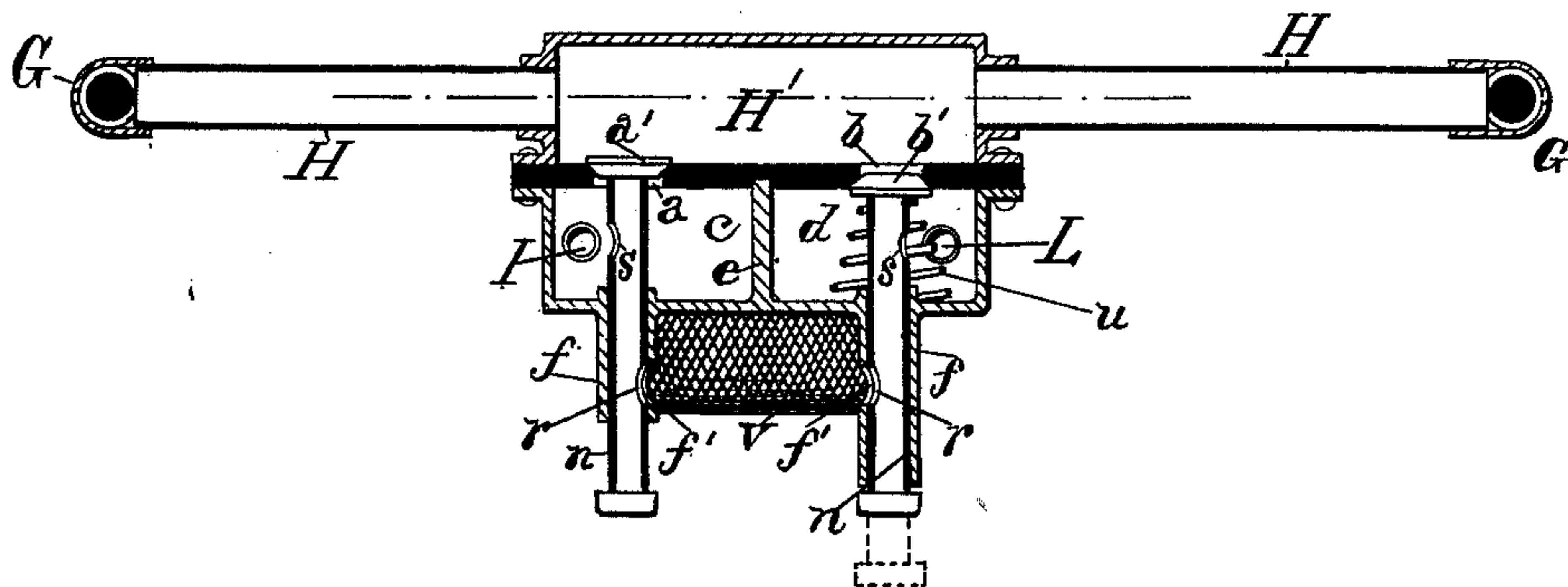


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH F. BATCHELOR, OF BALTIMORE, MARYLAND.

VACUUM AND AIR BRAKES.

SPECIFICATION forming part of Letters Patent No. 231,258, dated August 17, 1880.

Application filed June 24, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. BATCHELOR, a citizen of the United States, residing at Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Vacuum and Air Brakes; 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 a certain combination of valves with a brake-operating cylinder of a railroad-car, as hereinafter set forth, whereby either a vacuum-producing or compressed-air apparatus may be used on the same cylinder.

In the drawings hereto annexed, Figure 1 is a plan view, the cylinder and its connecting-pipes being in section. Fig. 2 is a vertical section of the parts, taken through the line in Fig. 1.

The letter A designates the cylinder, secured below the car-body, as usual, its length being placed crosswise of the car. B designates the brake-rods, and C a chain connected to the rods, and which passes over the pulleys D, one of which is secured to the car-body each side of the piston. The piston-rod E carries at its end a sheave or pulley, F, which draws on the chain and applies the brake.

The pipes G, running lengthwise of the car, connect with the operating apparatus on the engine, whether that be for producing vacuum or compressed air, and these pipes are connected together near the cylinder by the cross-pipes H, which enter a chamber, H', having in its bottom two openings forming valve-seats, the one, *a*, facing up, and the other, *b*, down.

Below the chamber H', and communicating therewith through the valve-openings, are two chambers, *c* *d*, separated from each other by the partition *e*. From the bottom of each of said lower chambers a tube, *f*, projects downward, and each tube has on the side which faces the other a port, *f'*. A hollow valve-stem or tube, *n*, is adapted to move up and down within each of the tubes *f*, which constitute a slide. One stem carries a valve, *a'*, which closes against its

seat by a downward movement. The other stem carries a valve, *b'*, which closes against its seat by an upward movement. Near the lower end of each hollow valve-stem is an opening, *r*, in the stem, which, when both valve-stoppers are against their seats, coincide with the port *f'* in the slide-tubes; and near the upper end of each valve-stem is another opening, *s*, in the stem, which communicates with the lower chamber through which the stem moves. From the lower chamber, *c*, a lateral pipe, I, leads to one end of the cylinder, and from lower chamber, *d*, another pipe, L, leads to the other end of the cylinder.

The chamber *c*, valves *a* *a'*, and exhaustion-pipe I will apply the brake when a vacuum-exhaust is used; and chamber *d*, valve *b* *b'*, and air-pressure pipe L will apply the brake when a compressed-air pump is used.

A car provided with the herein-described cylinder and valve mechanism may, therefore, be coupled in a train where the brake employed is operated either by the vacuum plan or the compressed-air plan.

The operation of my device is as follows: If a vacuum or partial vacuum is created in the pipes G the effect is to open valve *a'* or raise it from its seat, and to raise the valve-stem high enough to close the opening *r* and port *f'*. At the same time the valve *b'*, which is held to its seat normally by the spring *u*, is, by the suction, firmly held up to its seat, preventing the inlet of atmosphere. The vacuum then takes effect through the open valve *a'* and pipe I, relieving the air-pressure in the cylinder from the rear side of the piston-head T, while the pressure of the atmosphere takes effect on the front side of the piston-head, through the port *f'* and opening *r*, into the hollow stem, and thence, through opening *s*, into chamber *d*, and from there, through pipe L, into the cylinder. By this means the piston-head is forced back and the brake is applied. If compressed air is forced through pipes G the valves operate in exactly a reverse manner—that is, the valve *b'* is forced open and valve *a'* is closed. The pressure then takes effect on the front side of the cylinder and forces the piston-head back. It will be seen that when valve *b'* is forced open the valve-stem is pushed down, as shown in dotted lines in Fig. 2, low enough to close

the opening *r* and port *f'*, thereby preventing any escape of the pressure, while the air in the cylinder on the rear side of the piston finds outlet, through pipe *I* and opening *s*, into the
5 valve-stem, and thence through opening *r* and port *f'*, which are in coincidence.

The ports *f'* in the slide-tubes are protected on the outside by a wire screen or guard, *r*, which prevents dust from entering the cham-
10 bers.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a brake for railway-trains, the combi-
15 nation, substantially as set forth, of a cylinder secured to the car, a pipe attached to the cylinder for the exhaustion of a vacuum, a

pipe for admitting compressed air, and automatically-acting valves, substantially as described, to apply the brakes by a vacuum or
20 by compressed air.

2. In a brake for railway-trains, the combination of a cylinder secured to the car, pipes
I G, valve *a'*, automatically-acting valve *f r s*,
and chamber H', with pipes L G, valve *b'*, and
25 automatically-acting valve *f r s*, arranged substantially as shown, to apply the brakes by a vacuum or by compressed air, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH F. BATCHELOR.

Witnesses:

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