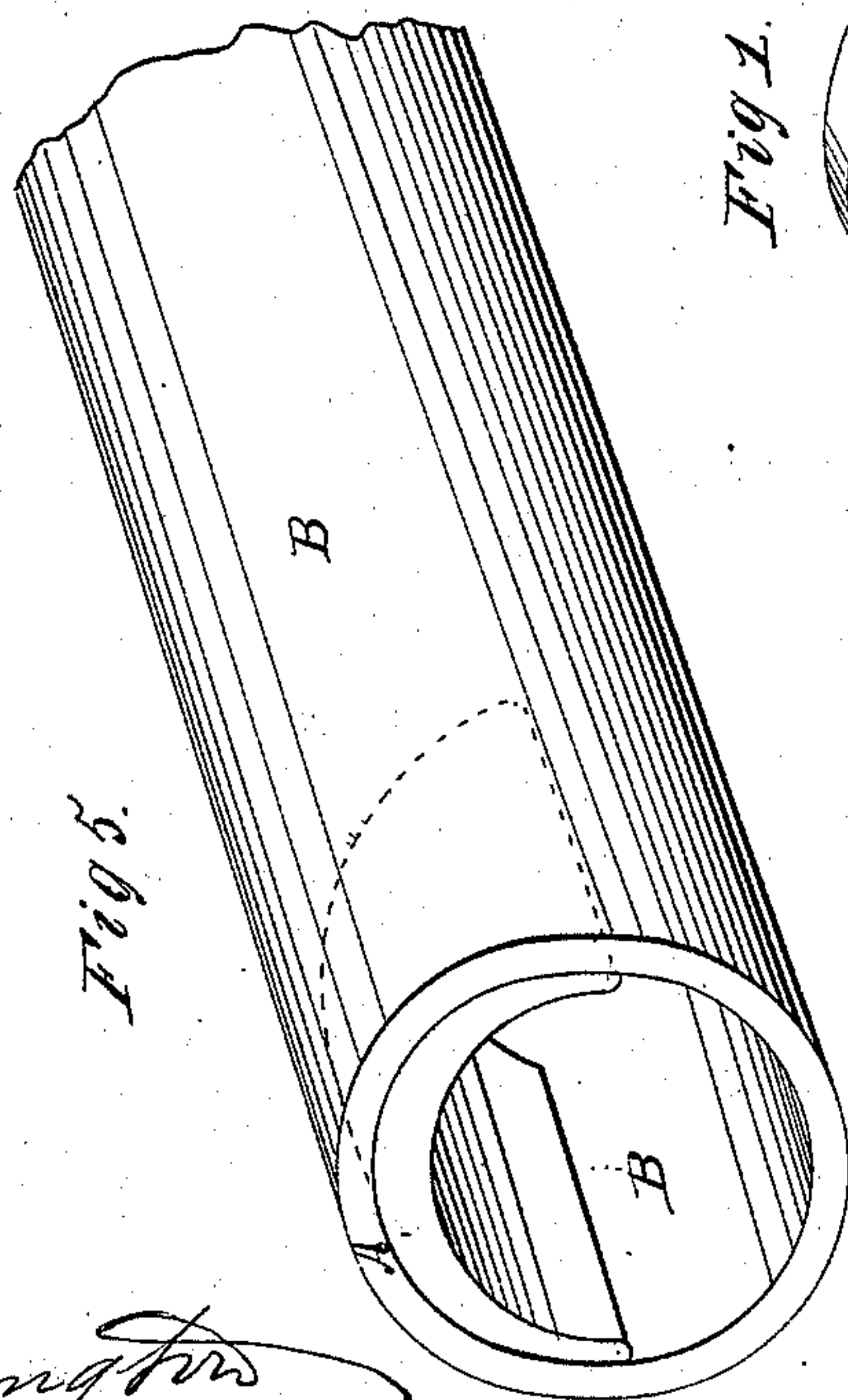
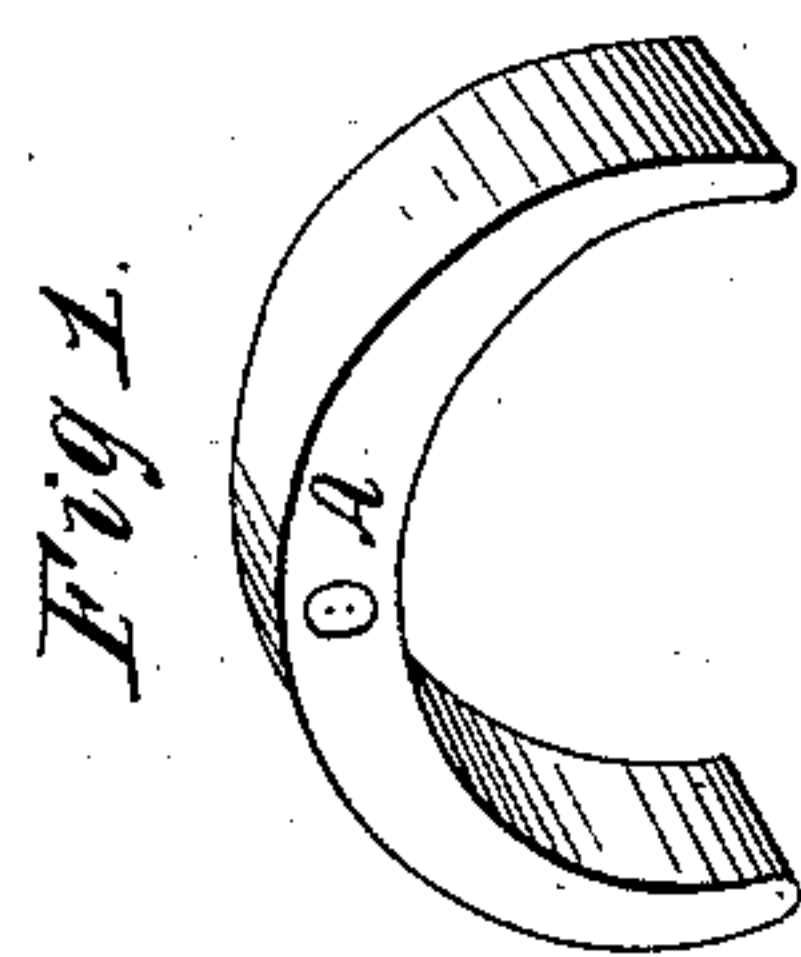
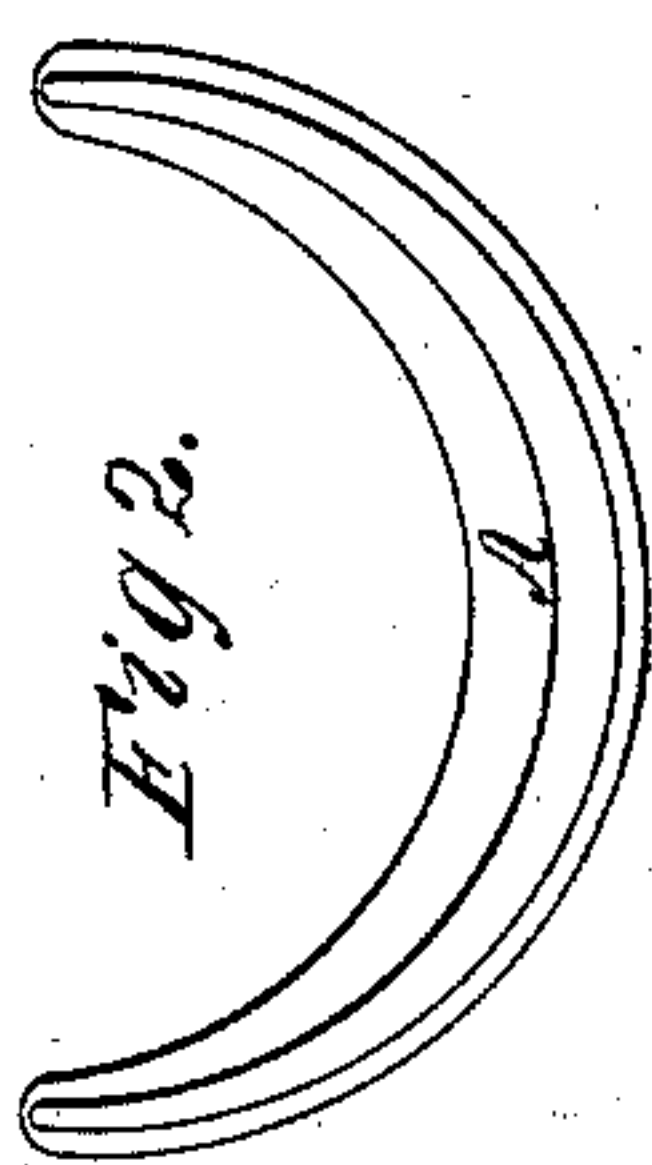
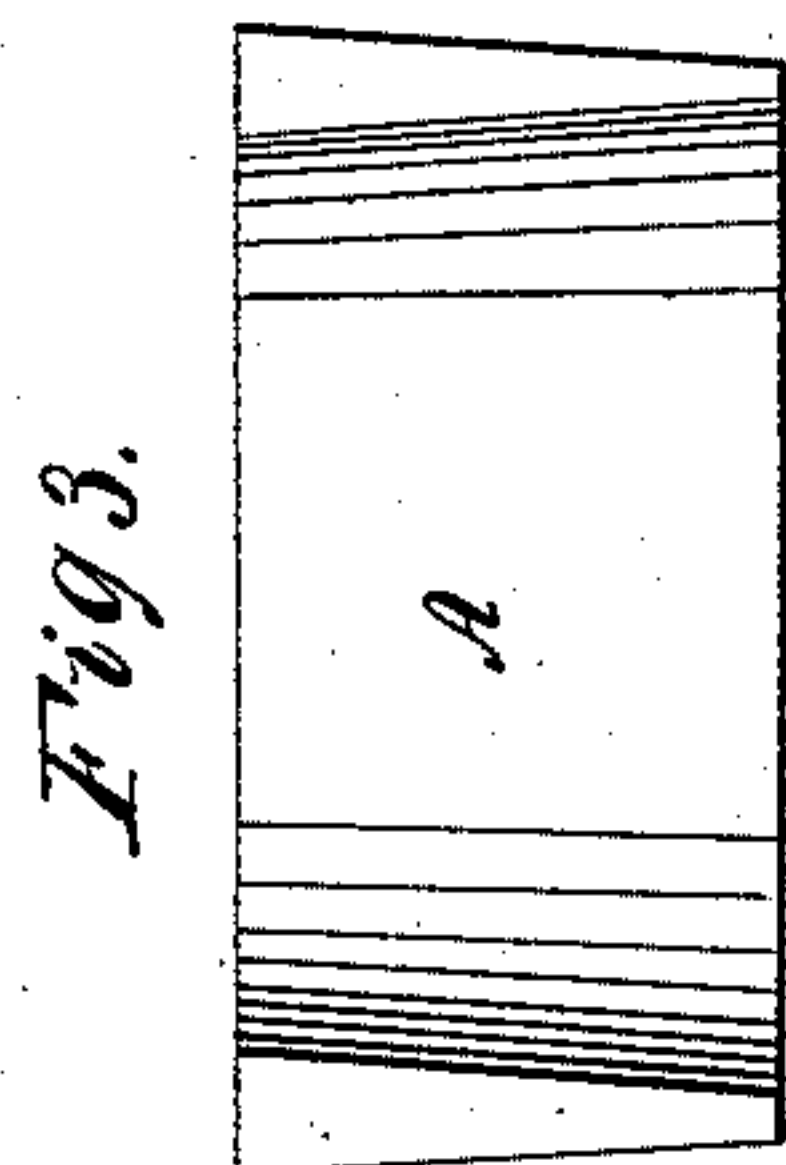
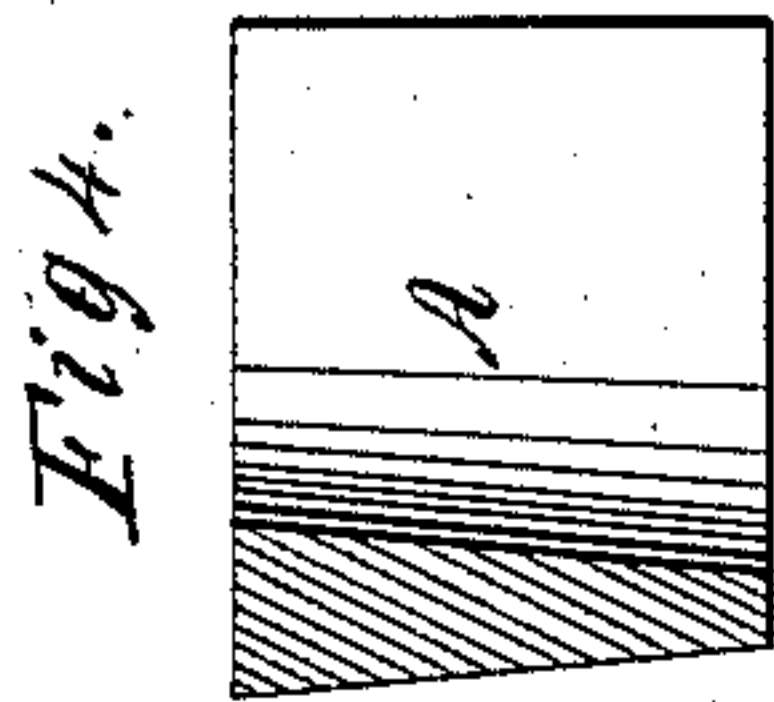


*C. W. Copeland,
Boiler-Tube Thimble.*

N^o 56,905.

Patented Aug. 7, 1866.



Witnesses.

*J. M. Huntington
Jas. A. Service*

Inventor.

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UNITED STATES PATENT OFFICE.

CHAS. W. COPELAND, OF NEW YORK, N. Y.

IMPROVEMENT IN TUBE-THIMBLES.

Specification forming part of Letters Patent No. 56,905, dated August 7, 1866.

To all whom it may concern:

Be it known that I, CHARLES W. COPELAND, of the city, county, and State of New York, have invented a new and useful Improvement in Tube-Thimbles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my improvement. Fig. 2 is a plan thereof. Fig. 3 is a side elevation; Fig. 4, a cross-sectional elevation; Fig. 5, a perspective view, showing the position of my improvement within a tube.

Similar letters of reference indicate corresponding parts.

In the construction and use of tubular steam-boilers, furnaces, and other tubular heating apparatus, it frequently occurs that, either from original proportion or a reduced duty being required, it becomes advisable, for the sake of economy, to reduce what is technically termed the "calorimeter" of the tubes by thimbling the tubes at the discharging end, thus reducing the velocity of the current of gases or draft through the tubes. This has usually been accomplished by inserting a short ring or thimble into the outlet end of the tubes. These thimbles are attended with the disadvantages, first, of checking the draft or current equally, or nearly so, on all sides of the tube; secondly, the ordinary thimble, by its projection within the tube, forms an obstacle to the progress and discharge of the light ashes which, by the ordinary effect of the draft, would be carried entirely through the tubes and discharged from them; but being arrested by the thimble they remain within the tube and form a non-conducting coating therein, and thus prevent the economical use of the fuel.

The ordinary rings or thimbles are also an obstacle in the way of properly clearing the tubes of soot and ashes when necessary.

My improvement meets and overcomes these objections, and also tends to promote an economy in the consumption of fuel, while my improved thimble is about one-half as expensive as the ordinary mode of thimbling by cylindrical rings, as already described.

My improvement consists in making the thimble of arch or semi-cylindrical or crescent form, as shown at A. Its surfaces are beveled much like the ordinary thimble, as shown in Figs. 3, 4, and 5, and it is driven into and held within the tube like the ordinary thimble.

The position of my improved thimble within the tube B is shown in Fig. 5. The thimble A occupies the upper part of the tube, and the thickness of the thimble is intended to be sufficient to govern the calorimeter of the tube to the size required.

The location of the thimble at the upper part of the tube serves to check and detain the hotter gases of combustion, which naturally rise to the top of the tube, so as better to allow the absorption of the caloric by the tubes.

By the use of my improvement the lower part of the tube is left entirely open and unobstructed, so that the light ashes before referred to are carried through and discharged from the tubes.

The use of my improvement also permits the free introduction and use of clearing-instruments, so that the tubes may be readily and thoroughly cleaned when desired, as the arch-shaped thimbles present no obstruction to the exit of brushings or scrapings when loosened by the instrument.

My improved thimbles are inserted and removed from the tubes in the same manner as the ordinary thimbles.

My improvement is not to be limited or confined to the exact shape of the thimble herein shown and described.

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

The construction of the calorimeter-thimble, substantially as herein shown and described, so as to govern the calorimeter and reduce the draft without obstructing the lower part of the tube, as set forth.

CHAS. W. COPELAND.

Witnesses:

WM. F. MCNAMARA,
ALEX. F. ROBERTS.