

2 Sheets—Sheet 1.

Patented Dec. 29, 1896.



Jac. L. Aldberg
Lewis M. Ford.

Inventors,
William E. Clarke.
John W. McEachren.
Geo. W. Tibbitts Attorney

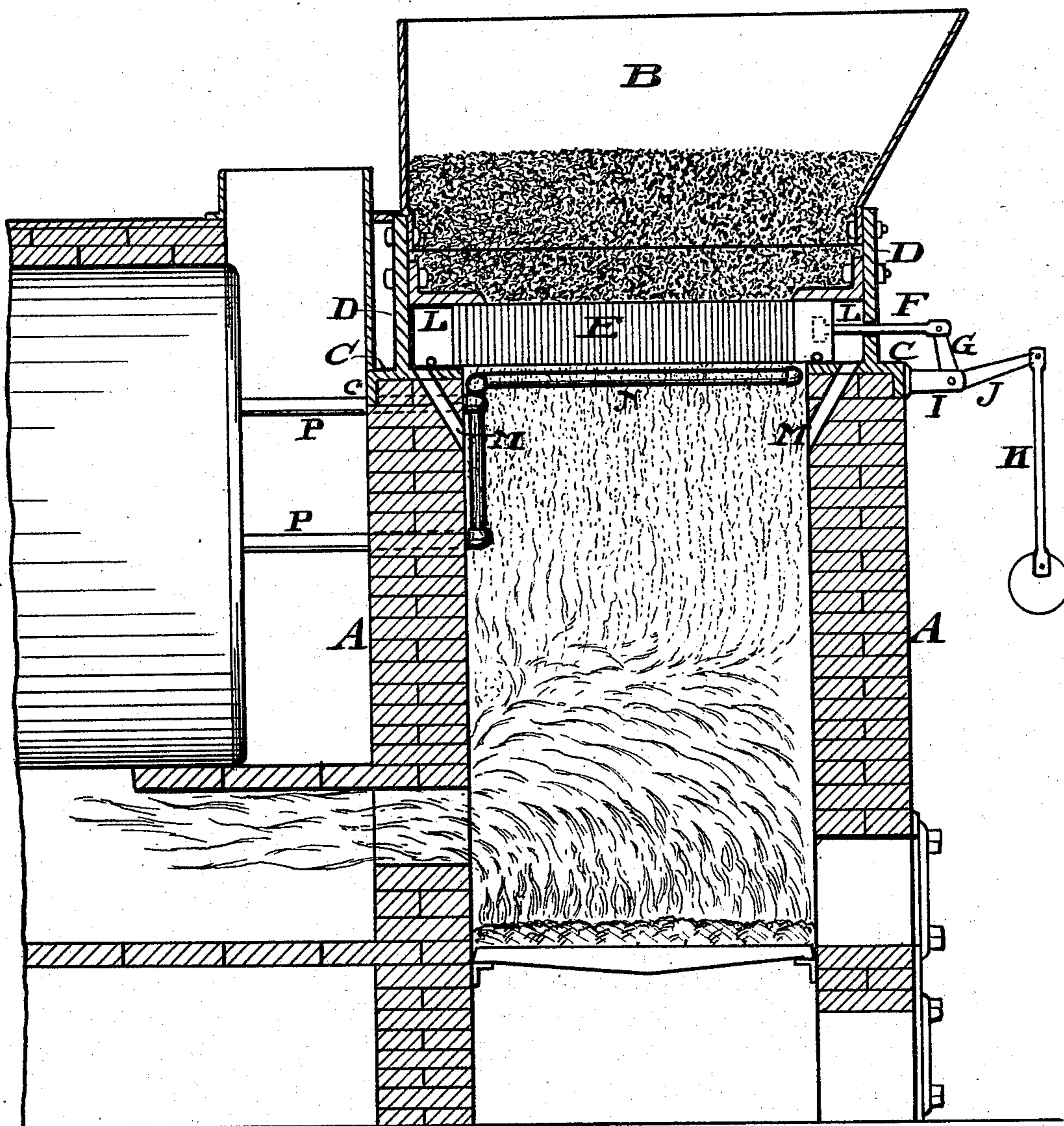
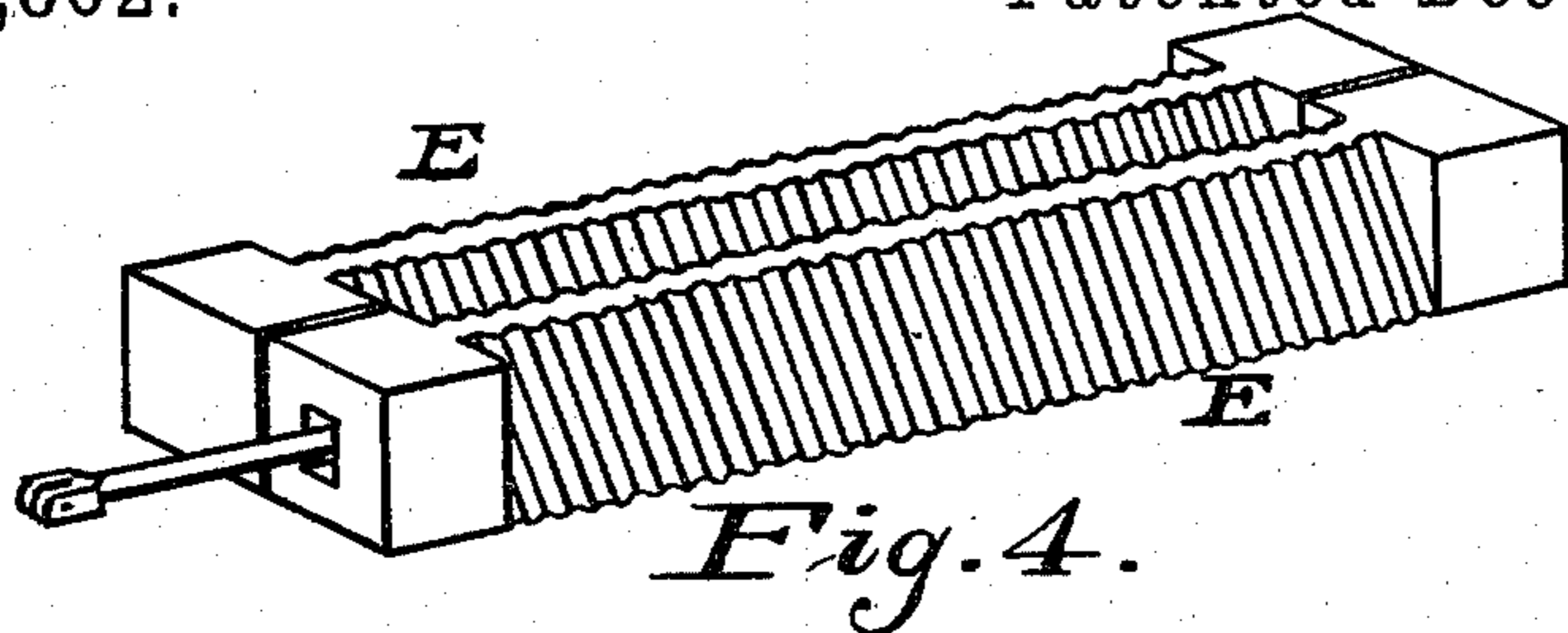
(No Model.)

2 Sheets—Sheet 2.

W. E. CLARKE & J. W. McEACHREN.
FURNACE FOR PULVERIZED FUEL.

No. 573,862.

Patented Dec. 29, 1896.



Witnesses.

Jac. Goldberg
Lewis M. Ford

Fig. 3.

Inventors,

William E. Clarke.
John W. McEachren
Geo. W. Tibbitts Attorney

UNITED STATES PATENT OFFICE.

WILLIAM E. CLARKE AND JOHN W. MCEACHREN, OF CLEVELAND, OHIO.

FURNACE FOR PULVERIZED FUEL.

SPECIFICATION forming part of Letters Patent No. 573,862, dated December 29, 1896.

Application filed April 6, 1896. Serial No. 586,460. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. CLARKE and JOHN W. MCEACHREN, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in the Method of and Means for the Combustion of Pulverized or Fine Fuel, of which the following is a specification.

This invention relates to the combustion of pulverized or fine fuel; and it consists in the new construction and adaptation of a furnace for carrying out the principles of the invention whereby a complete consumption of fuel, without loss or waste through smoke, and increased benefits from combustion are the direct results, thus making it a very economical and efficient means of accomplishing the best results.

The principles on which the invention is based are the showering of fine particles of fuel over a fire in the furnace in such a manner that the fine fuel takes fire while falling and the combustion takes place in its transit, thereby quickly eliminating the carbon and gases before reaching the grate-bars, so that every particle of fuel must be ignited and thoroughly subjected to the process of combustion. This process is greatly enhanced by the facility of the intermingling of air with the products of combustion thus eliminated, which increases the flames and intensifies the heat. The fuel thus treated and not wholly consumed is deposited on the grate and produces a bright incandescent fire, which ignites the constantly-descending particles of fuel and keeps up a steady continuous fire.

In the accompanying drawings, Figure 1, Sheet 1, is a front elevation of our new furnace. Fig. 2 is a vertical section on line 2 2, Fig. 3. Fig. 3, Sheet 2, is a vertical section on line 3 3, Fig. 1. Fig. 4 is a detached view of two of the corrugated bars forming the bottom of the hopper on the top of the furnace.

A A represent the walls comprising the furnace, having suitable doors in front of the fireplace and the ash-pit. This we place in front of a boiler and its setting, providing an opening O above the fire-grates, leading in under the boiler, through which the flames pass, as represented in Fig. 3. On the top

of the wall is placed a fuel-holding hopper B, which forms the principal part of our new construction.

C is a cap having an all-around flange c, which fits over the outside top edge of the wall.

D is a funnel-shaped basin cast with said cap and without a bottom.

E E are triangular-shaped bars, having square ends, placed in the bottom of said basin, side by side, so that the triangular sides of the bars form troughs extending across the bottom of said basin. The triangular sides of said bars are corrugated. Every alternate bar is made reciprocal, and is provided with a connecting-rod F, as seen in Figs. 1 and 3, connecting them with levers G G on a rock-shaft H, supported by brackets I I on the front of the cap C.

J is a lever on the rock-shaft, connected by a rod K with a crank-shaft or other suitable means, whereby motion may be applied for imparting reciprocal motion to said bars E. E.

L L are bars placed over the ends of the bars E E to cover the spaces at their ends to prevent fuel from falling into said spaces. M M are slanting flues in the walls A A, leading from the said spaces down into the inside of the furnace to provide for the discharge of any fine fuel that may find its way into said spaces.

N N are water-pipes located underneath the bars E E, and are connected with the boiler by pipes P P, and are provided for a circulation of water as a protection for the said bars E E against the heat. The fine fuel falls between said water-pipes, as indicated by the arrows.

From the foregoing the workings of this device will be seen to be as follows: The hopper being supplied with slack or fine fuel, the reciprocating movements of the bars E E will cause the fine fuel to be sifted through the corrugations and discharged in a continuous shower, as seen in Fig. 3, throughout the whole area of the combustion-chamber, and which will be quickly ignited as it descends, and its consumption is immediate and thorough.

Having described our invention, we claim—

1. In a furnace for burning pulverized or fine fuel, the combination with the combus-

tion-chamber, of a fuel-holding hopper B and basin D, triangular bars E E forming the bottom of said basin, and means substantially as described for imparting reciprocal motion to
5 each alternate bar, substantially as and for the purpose set forth.

2. In a furnace for burning pulverized fuel, the combination with the combustion-chamber, the fuel-holding hopper B, basin D and

the bars E E, of the water-pipes N N undersaid bars E E, substantially as and for the purpose set forth.

WM. E. CLARKE.

JNO. W. MCEACHREN.

Witnesses:

JAMES LAWRENCE,

GEO. W. TIBBITTS.