C. C. BURGENER.

WATER HEATER.

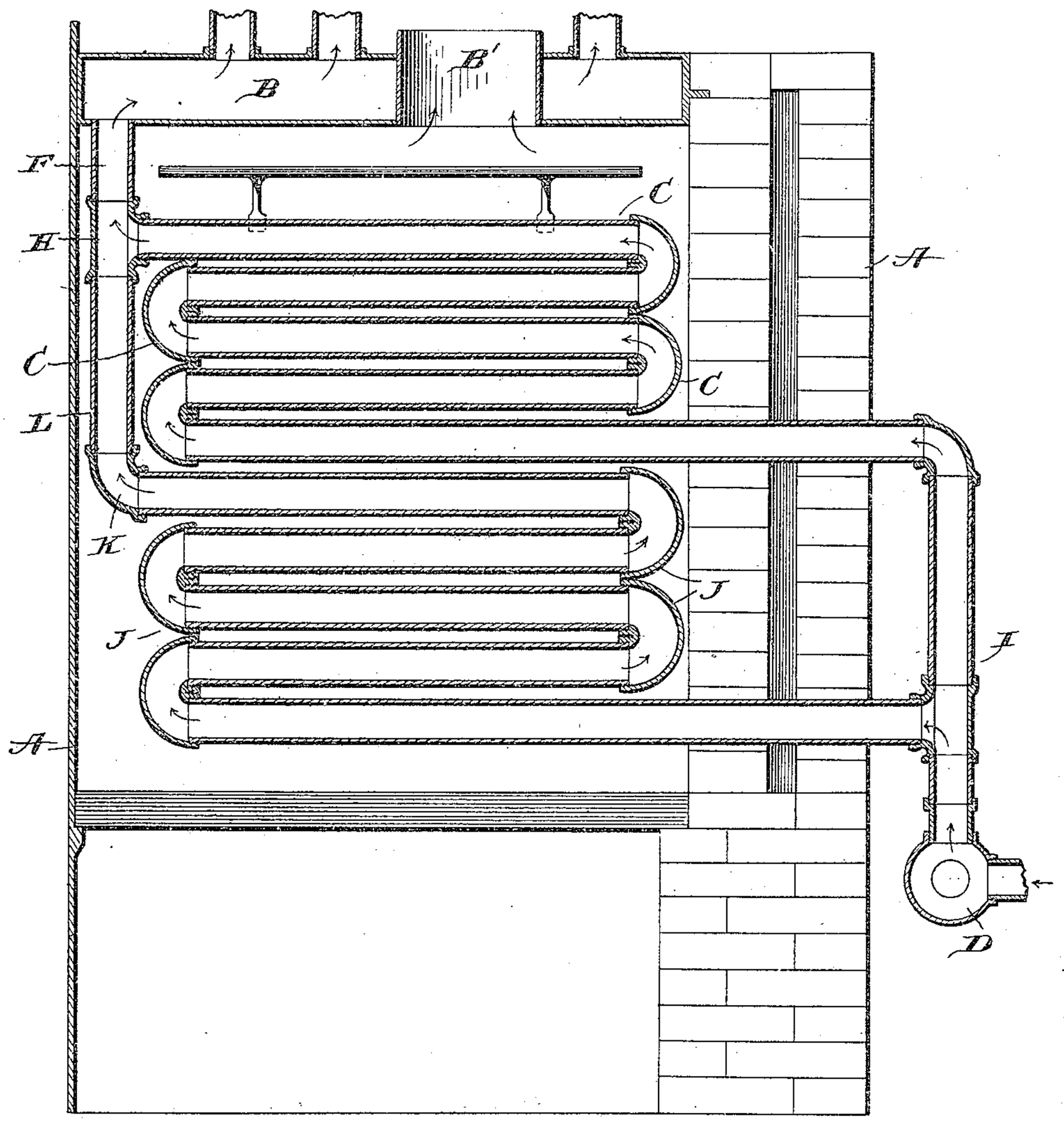
APPLICATION FILED FEB. 13, 1909.

952,874.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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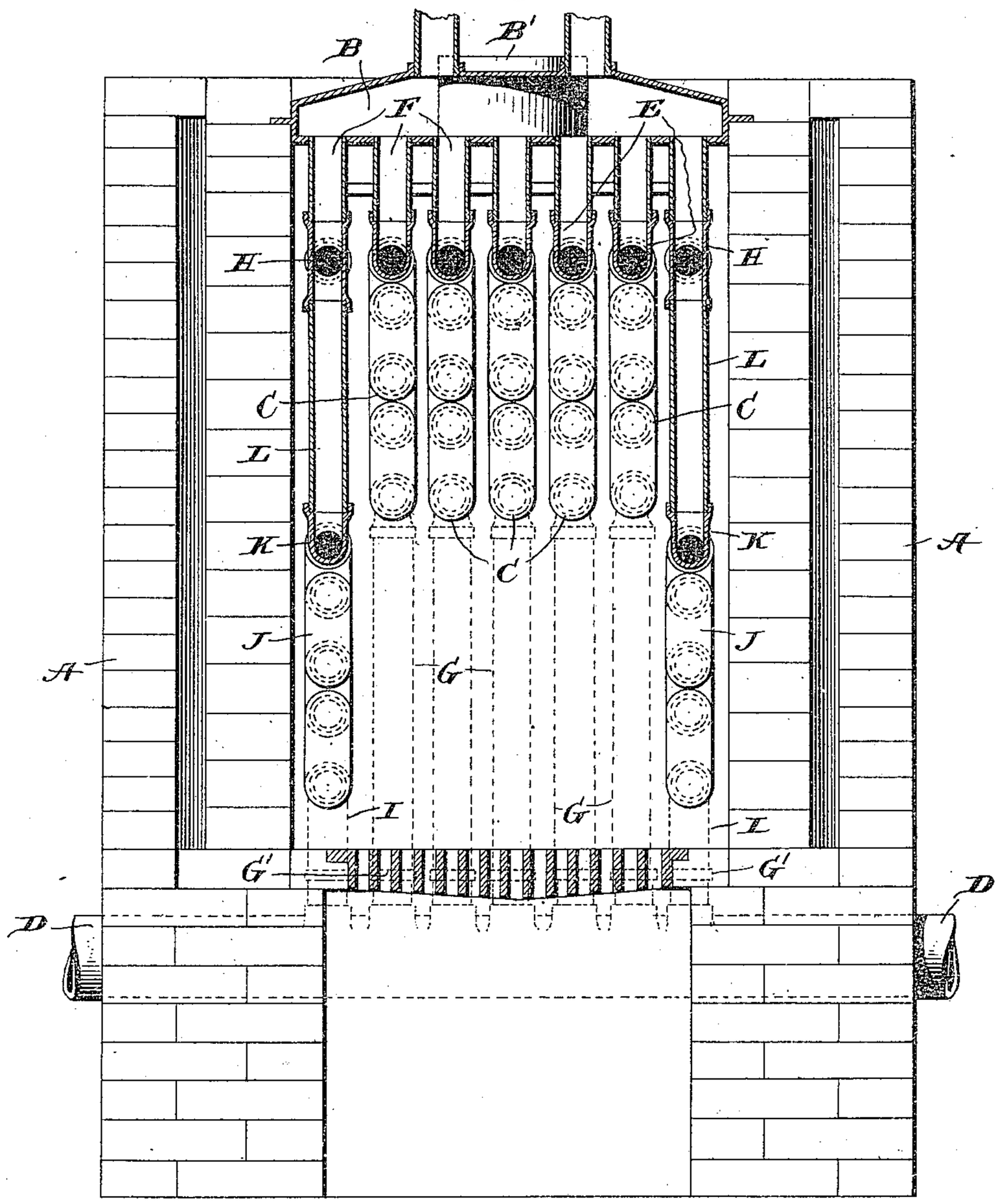
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

CHRISTOPHER C. BURGENER, OF GALION, OHIO.

WATER-HEATER.

952,874. Specification of Letters Patent. **Patented Mar. 22, 1910.**

Application filed February 13, 1909. Serial No. 477,714.

To all whom it may concern:

Be it known that I, CHRISTOPHER C. BURGENER, a citizen of the United States, residing at Galion, (post-office address 634 West Main street, Galion, Ohio,) in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in water heaters and more particularly to that type in which the heating of the water is effected through the medium of a coil or coils which are positioned in the fire box of a furnace.

The object of the present invention is the provision in a heater of this character of a plurality of sections or coils which are so positioned in the fire box as to afford a large direct heating surface and which are of such construction that any of such coils or sections may at any time be removed independently of the other.

A further object of the present invention is the provision in a furnace of this character in which a plurality of sections or coils are interposed between the distributing dome and return header, which coils are arranged in the upper part and at the sides of the fire box of the furnace, the coils being so arranged and constructed that a perfect circulation is obtained through all of them at all times.

A further object of the invention is the provision of a water heater of this type in which the several sections or coils are connected to the distributing dome and header by couplings of such construction that any of said sections may be at any time removed without disturbing the remaining sections.

Other objects of the invention will be apparent from the detailed description hereinafter when read in connection with the accompanying drawing forming a part hereof wherein a convenient embodiment of the invention is illustrated and wherein like numerals of reference refer to similar parts in the several views.

In the drawings, Figure 1 is a longitudinal section of my improved water heater, and Fig. 2 is a transverse section of the same.

Referring now more particularly to the drawings A designates a furnace which may be of any convenient type but which is preferably formed with masonry side and rear walls, the interior of the furnace being formed of side and rear walls of fire brick, which are spaced from the side and rear exterior walls so as to form an air space therebetween. The furnace is provided with a grate of any desired type and with the usual metallic front having doors of any suitable construction therein to afford access to the fire box and ash pit of the furnace.

Positioned within the upper part of the fire box of the furnace is a distributing dome B, from which extend the usual pipes to the system. A flue B′ extends from the interior of the furnace through the distributing dome B to permit the escape of the products of combustion. Positioned within the upper portion of the fire box of the furnace and substantially filling the same are a plurality of sections C, each of which is adapted to be connected at one end to the distributing dome and at its other end to the usual return header D of the system which is positioned outside of the furnace and below the fire box thereof.

The sections C, which are uniform in size and construction, each comprises a plurality of looped coils, which extend substantially from the front to the rear of the fire box of the furnace, the several sections being arranged side by side and in close proximity to each other so that all of the coils thereof will be subjected directly to the heat of the fire. The uppermost pipe of each of the sections C, with the exception of the two sections which lie directly along side of the side walls of the fire box, have their outer ends threaded into elbow couplings E, which are in turn connected by suitable couplings F with the distributing dome B. The couplings employed for this purpose are preferably short pipes, the opposite ends of which are oppositely threaded so as to engage threaded openings in the distributing dome B and the elbow couplings E. By using couplings of this type it will be seen that packed joints are obviated, and as each coupling pipe has its ends oppositely threaded, it will be seen that by rotating the same any one of the sections C may be readily disconnected from the distributing dome B. The lowermost pipe of each of the sections C, with the exception of the two sections which lie directly along side of the side walls of the fire box, extend rearwardly through the back walls of the furnace and are connected by suitable pipe joints with downwardly ex-

tending pipes G, the lower ends of which are detachably connected by means of suitable couplings G′ with the return header D. The couplings G′ preferably comprise tubular nuts, which are interiorly threaded at the upper ends thereof to engage external threads on the lower ends of the pipes G, and exteriorly threaded at their lower ends to engage threaded apertures in the return header D. The upper pipes of the sections C which lie along side of the side walls of the fire box have their forward ends threaded into T couplings H, the upper arms of which are connected to the distributing dome B by couplings similar in construction to the couplings F heretofore described, the lower pipes of said sections being extended rearwardly through the back wall of the furnace and connected by suitable pipe joints with downwardly extending pipes I, the lower ends of which are connected to the return header D by couplings similar in construction to the couplings G′ heretofore described. Positioned along side of the side walls of the fire box of the furnace and directly below the two outermost sections C, are two sections J, which are similar in size, form and construction with the sections C heretofore described. The upper pipes of the sections J have their forward ends threaded into elbow couplings K, the upwardly extending arms of which are detachably connected to the downwardly extending arms of the T couplings H, heretofore described, by means of pipes L. The lower pipes of the sections J extend rearwardly through the rear wall of the furnace and are detachably connected by suitable pipe couplings with the downwardly extending pipe I heretofore referred to.

From the above construction, it will be seen that a plurality of pipe sections of similar form and construction are utilized to completely fill the upper portion of the fire box and to lie alongside of the side wall of the fire box, so that all the heat in the fire box is effectively utilized, and as the distance which the water must travel from the return header to the distributing dome is the same in every section, it will be obvious that a perfect circulation will be maintained in all the sections.

It will also be apparent from the above described construction that any one of the coils or sections may be disconnected from the distributing dome and return header without disturbing any of the other sections.

While a convenient embodiment of the invention is illustrated in the accompanying drawings, it will be obvious that many changes may be made to the form therein shown without departing from the spirit and scope of the invention as defined in the appended claim.

I claim:

In a water heater, the combination with a fire box of a furnace, a distributing dome and return header, a plurality of coil sections arranged side by side in the upper portions of the fire box, pipes for detachably connecting each of said coil sections with the distributing drum and return header, a pair of lower coil sections of the same size as the upper coil sections positioned therebeneath at the sides of the fire box, and pipes detachably connecting each of said lower coil sections with the inlet and outlet pipes of the coil sections positioned directly thereabove, whereby the distance from the return header to the distributing drum through each of the coils is the same.

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

CHRISTOPHER C. BURGENER.

Witnesses:
LEWIS KLAPMAN,
CARL J. GUGLER.