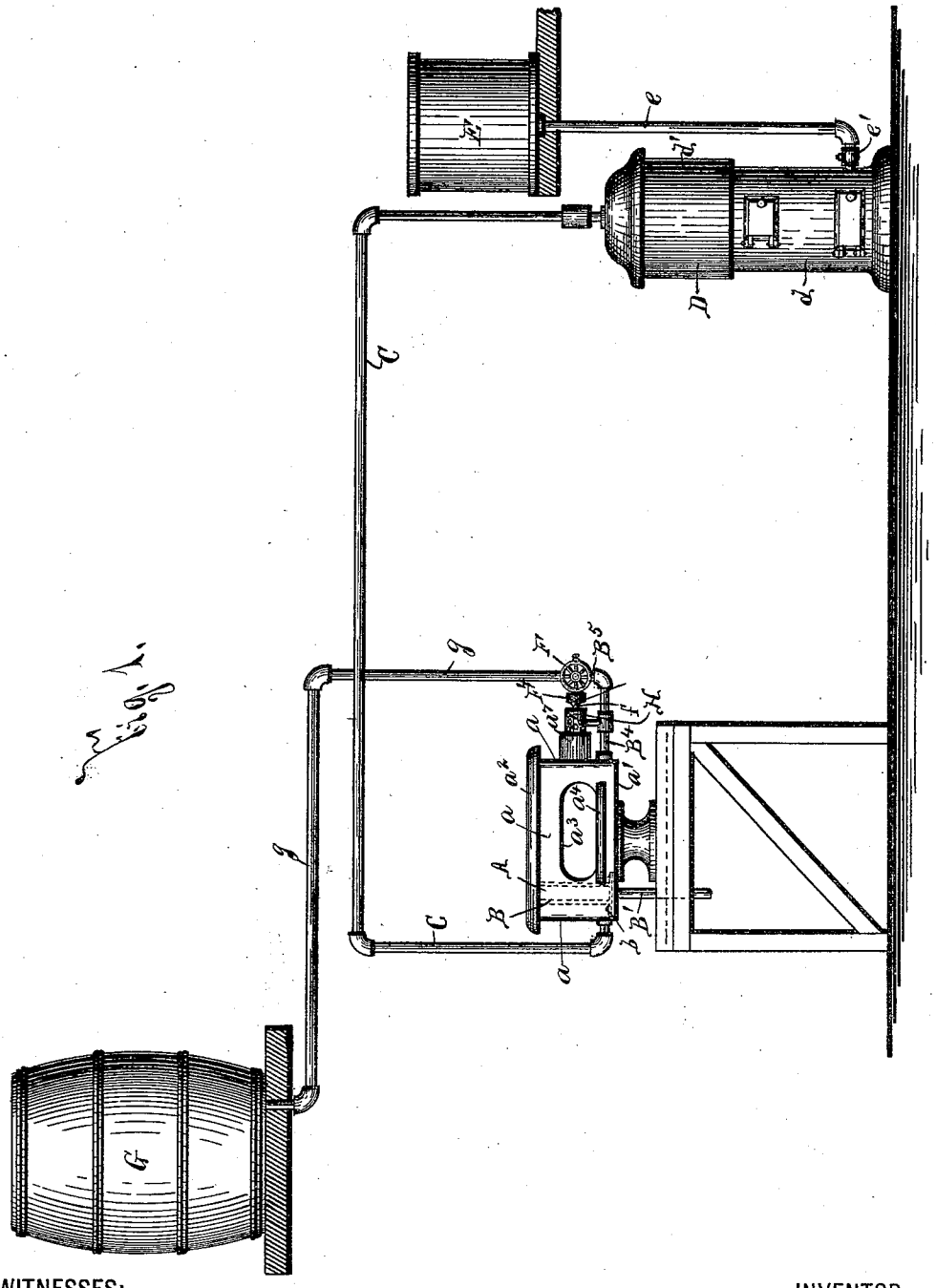
(No Model.)

2 Sheets—Sheet 1.

C. A. BURT.

HEATING APPARATUS.

No. 512,000. Patented Jan. 2, 1894.



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WASHINGTON, D. C.

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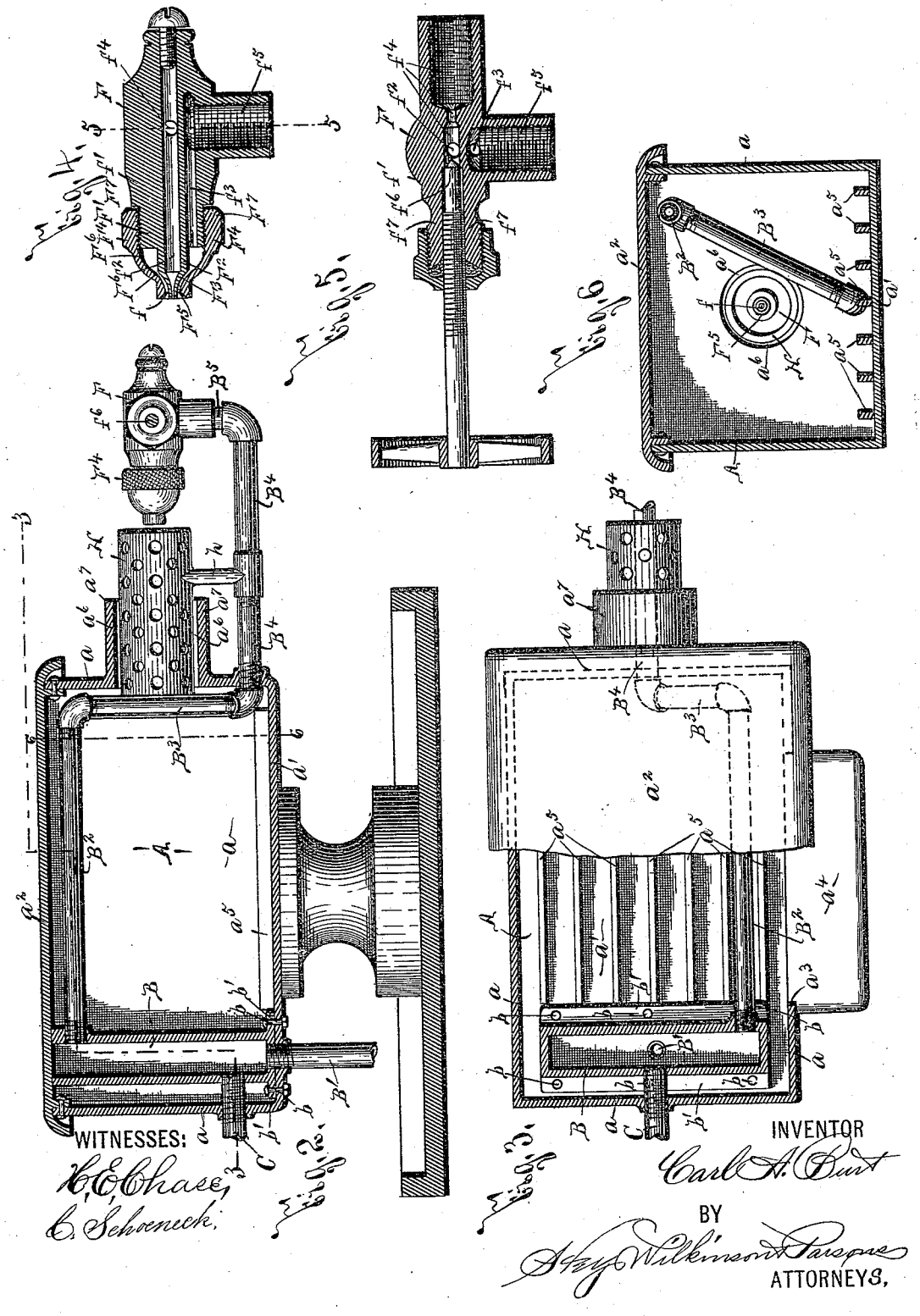

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UNITED STATES PATENT OFFICE.

CARL A. BURT, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE BURT MANUFACTURING COMPANY, OF SAME PLACE.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 512,000, dated January 2, 1894.

Application filed May 27, 1892. Serial No. 434,593. (No model.)

To all whom it may concern:

Be it known that I, CARL A. BURT, of Rochester, in the county of Monroe, in the State of New York, have invented new and useful Improvements in Heating Apparatuses, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in heating apparatus particularly adapted for heating soldering irons and similar articles quickly, economically, and efficiently. To this end it consists, essentially, in a chamber for receiving the article to be heated, an upright box forming a steam conduit or super-heating chamber within the receiving chamber, a burner for heating the receiving chamber and the steam conduit, a connecting pipe between the steam conduit and the burner for conducting the steam thereto, a pipe for conveying hydrocarbon or other fuel to the burner, valves for regulating the flow of the steam and hydrocarbon, and in the detail construction and arrangement of the parts, all as hereinafter more particularly described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings, forming a part of this specification, in which, like letters indicate corresponding parts in all the views.

Figure 1 is an elevation of my improved apparatus illustrating the general construction and arrangement of the parts. Fig. 2 is a longitudinal vertical sectional view of the detached receiving receptacle. Fig. 3 is a horizontal sectional view, taken on line —3—3—, Fig. 2. Fig. 4 is a longitudinal vertical sectional view of the burner and connected short portions of the pipes for conveying steam and hydrocarbon thereto. Fig. 5 is a similar transverse sectional view, taken on line —5—5—, Fig. 4, and Fig. 6 is a transverse vertical sectional view, taken on line —6—6—, Fig. 2.

—A— represents the receiving chamber, which is of any desirable form, size, and construction, being preferably composed of the upright sides —*a*—, the bottom wall or base —*a'*— and the removable top wall —a^2—. In the front upright wall —*a*— is an opening —a^3— serving as an outlet for the products of combustion, and also for the reception of the soldering irons or other articles to be heated, and at the base of said opening is the outwardly extending flange —a^4— for supporting the handles of the soldering irons.

The articles to be heated are supported upon the base or bottom wall —*a'*— of the chamber —A— and said wall is formed with a series of projecting ribs or corrugations —a^5— for reducing to a minimum the amount of surface supporting said iron and for enabling the hot gases to entirely surround the soldering irons in order that the same may be quickly and uniformly heated.

—B— is an upright closed box forming a conduit or super-heating chamber, which is arranged along one of the end walls of the chamber —A—, as best seen at Figs. 2 and 3. This conduit is preferably formed of a closed box remote from the surrounding shell of the chamber —A—, and is held removably in position on the base —*a'*— by screws or other securing means —*b*— passed through lugs —*b'*— projecting from its base. Steam is conveyed to said conduit, and preferably at its lower extremity by a pipe —C— of suitable size and construction connected to a heater —D—, which may be of any desirable form, size, and construction for producing steam.

The heater here shown consists of a combustion box —*d*—, and a steam drum —*d'*—, and is supplied with water by a pipe —*e*— provided with a suitable check valve —*e'*—, and connected to a superimposed tank or other water supply —E—. It will thus be understood that steam is continuously fed to the conduit or super-heating chamber —B—.

As clearly seen at Figs. 1 and 2 a drip pipe —B'— opens from the base of the conduit —B— and conveys therefrom any water carried through the pipe —C— or condensed within the conduit —B—. The super-heated steam is conducted from the chamber —B— by a pipe —B^2— opening from the upper extremity thereof and provided with the downwardly deflected or inclined end —B^3— arranged at one side of an opening —a^6— for registering with the burner —F—, presently described, this construction permitting the expansion and contraction of the pipes —B^2— and —B^3—. The deflected end —B^3— of the

pipe —B^2— extends to the base of the chamber —A—, passes out through the upright end wall directly opposite to the chamber —B—, and is connected to the substantially horizontally extending pipe —B^4—, which forms a continuation of the pipe —B^2—, and is formed with the upturned end —B^5— discharging directly into the burner.

The opening —a^6—, previously mentioned, is directly opposite to the central portion of the steam conduit or super-heating chamber —B—, and extending outwardly at the edge of said opening from the end wall provided therewith, is a flange —a^7—.

Hydrocarbon or other fuel is conducted to the burner —F— by a pipe —*g*— leading from a suitable reservoir —G—. The burner —F— is, as previously stated, arranged so as to register with the opening —a^6—, its exit —*f*— being preferably in direct alignment with the central portion of said opening —a^6— for directing the flame through the same against the soldering irons supported in the opening —a^3— and against the adjacent wall of the super-heater chamber —B—.

The burner —F— consists of a head —*f'*— of suitable form, size, and construction formed with a central passage —f^2— for the hydrocarbon, an outer passage —f^3— for the steam, and with a horizontal branch passage —f^4— connected to the hydrocarbon conveying pipe —*g*—, and to the central passage —f^2—, and a vertical branch passage —f^5— connected to the end —B^5— of the steam conveying pipe and to the outer passage —f^3—.

At the exit end of the burner —F— is a reduced screw threaded shoulder —F'—, and the projecting nipple —F^2— formed with the inclined periphery —F^3— provided with a central contracted discharge opening for the hydrocarbon. Screwing upon the shoulder —F'— is an adjustable cap —F^4—, which encircles the nipple —F^2—, is of greater interior diameter than said nipple for forming a steam chest or passage around the same, and is so arranged that when the cap is screwed home on the shoulder the extreme tapered extremity of the nipple projects slightly beyond the inner wall —F^5— of a socket formed at the outer end of the cap and the annular space between the cap and nipple is reduced to its minimum size. This projection of the nipple —F^2— beyond the wall —F^5— of the adjustable cap —F^4— is a vital feature of my invention, as I have discovered upon practical working of my burner that when the nipple does not project beyond the wall —F^5—, the flame is extinguished by the steam which follows along the nipple to its extreme end, and emerges therefrom in a narnow stream, thus intervening between the hydrocarbon and the flame until it passes beyond the exit wall —F^5— into the socket at the front end of the cap —F^4—, and is then free to expand or become atomized. The desired projection of the nipple —F^2— is readily adjusted at will by moving the cap —F^4— and the extreme end of the cap —F^4— serves also to protect the end of the nipple —F^2—, which, although it projects beyond the wall —F^5—, can not protrude from within the socket in front of said wall, since the shoulder F' is too shallow to permit it. The cap —F^4— is formed on its interior with a tapering seat —F^6—, and the flow of the steam is varied by adjusting the cap lengthwise on the shoulder —F'— and moving the seat —F^6— toward and away from the inclined periphery —F^3— of the nipple —F^2—. The flow of the oil is varied by any suitable construction of valve —f^6—, which is movable horizontally through a nipple —f^7— across the central passage —f^2— and into the inner end of the branch passage —f^4—.

Instead of discharging the burner —F— directly through the inlet opening —a^6— of the chamber —A— I prefer to support within said opening a combustion tube —H—, which may be of desirable form, size, and construction, but preferably consists of a cylindrical perforated shell supported by an arm —*h*— rising from the pipe —B^4—, and held adjustably thereon by a set screw —*h'*—.

In the practical operation of my invention the heater —D— is brought into action to generate the steam which is conveyed by the pipe —C— to the conduit —B— and thence to the burner —F—; the burner is then brought into action by opening the valve —f^6— and igniting the hydrocarbon and steam. As the steam fed by the pipe —C— slightly increases in pressure, owing to the continued action of the heater for a minute or two, the flame of the burner commences the required super-heating of the conduit —B— to effect the most desired utilization of the hydrocarbon and steam. The superheated steam also increases the action of the burner, and the cap —F^4— and valve —f^6— may be then adjusted to the required degree to feed a minimum degree of oil and the required proportion of steam for effecting the desired heat of the soldering irons. Should the conditions vary the cap —F^4— and the valve —f^6— may be suitably adjusted to supply a greater or less amount of steam or hydrocarbon and the heater —D— may be also operated to feed steam of greater pressure.

The operation of my invention will be readily understood from the foregoing, and it will be noted that it is extremely simple, uses a minimum degree of fuel, and is particularly applicable for the designed purpose, since it is always in condition for instant use. and is efficient and durable. It is evident, however, that I do not herein limit myself to the precise detail construction and arrangement of the parts, as the same may be somewhat varied from that shown and described.

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

1. The herein described heating apparatus for heating soldering irons and similar arti-

cles, the same comprising a chamber having a heat outlet opening in one of its side walls which also serves for the insertion of the articles to be heated, an upright box forming a steam conduit of greater width than thickness arranged within the chamber at one side of said opening and having its upright side walls separated from the adjacent walls of the chamber for permitting a circulation around the side walls of said conduit, lugs at the base of said conduit, screws passing removably through said lugs into the base of the chamber, a burner at the opposite side of the said opening for heating said chamber and conduit, a pipe for conveying hydrocarbon or other fuel to the burner, and a connecting pipe between the steam conduit and said burner for conducting steam thereto, substantially as described.

2. The herein described heating apparatus for heating soldering irons and similar articles, the same comprising a chamber having a heat outlet opening in one of its side walls and a heat inlet opening in a wall at one side of the former opening, an outwardly extending flange around said inlet opening a steam conduit arranged within the chamber at the opposite side of the outlet opening and opposite to the inlet opening, a burner aligned with the latter opening and having its discharge end separated from the wall of said chamber provided with the latter opening, whereby the burner heats said chamber and conduit, a cylindrical perforated shell within said flange between the burner and chamber, means for permitting the longitudinal adjustment of said shell, a pipe for conveying hydrocarbon or other fuel to the burner, a connecting pipe between the steam conduit and said burner for conducting steam thereto, and a drip pipe opening from the base of said conduit, substantially as specified.

3. The herein described heating apparatus for heating soldering irons and similar articles, the same comprising a chamber having a corrugated support at its base for said articles and having a heat outlet opening in one of its walls and a heat inlet opening in a wall at one side of the former opening, a flange projecting forward from below said outlet opening a steam conduit arranged within the chamber at the opposite side of the outlet opening and opposite to the inlet opening, said conduit comprising a narrow box detachably connected with the base of said chamber and having its upright side walls separated from the adjacent walls of the chamber for permitting a circulation around the side walls of said conduit, a burner aligned with the inlet opening and having its discharge end separated from the wall of said chamber provided with the latter opening, whereby the burner heats said chamber and conduit, a pipe for conveying hydrocarbon or other fuel to the burner, a connecting pipe between the steam conduit and said burner for conducting steam thereto, and a drip pipe opening from the base of said conduit, substantially as set forth.

4. The herein described heating apparatus for heating soldering irons and similar articles, the same comprising a chamber provided with a corrugated bottom and having a heat outlet opening in one of its side walls and a heat inlet opening in a wall at one side of the former opening, a steam conduit arranged within the chamber at the opposite side of the outlet opening and opposite to the inlet opening, a cylindrical combustion tube aligned with the latter opening and formed with perforations for the inlet of air, a burner aligned with the combustion tube and having its discharge end separated from the wall of said chamber provided with the latter opening, whereby the burner discharges through said combustion tube and heats said chamber and conduit, a pipe for conveying hydrocarbon or other fuel to the burner, a connecting pipe extending from the steam conduit across within the top of said chamber, down at the farther end thereof alongside said inlet opening, out through this end, and to said burner for conducting steam thereto, an arm rising from this pipe outside the chamber and supporting said combustion tube, and a drip pipe opening from the base of said conduit, substantially as and for the purpose set forth.

5. The combination with separate hydrocarbon and steam conveying pipes; of the herein described burner, the same comprising a head having a reduced and exteriorly screw threaded shoulder —F′— at its outer end, and a nipple —F²— smaller than and projecting beyond said shoulder and formed with a tapering outer end provided with an inclined periphery —F³—, said head being provided with a hydrocarbon passage connected to the hydrocarbon pipe and discharging from the outer end of said nipple and being provided with a steam passage connected to the steam pipe and having its discharge end in a plane within that of the outer end of said nipple, and a cap —F⁴— formed with an engaging shoulder adjustably mounted on the shoulder —F′— for incasing the nipple —F²—, said cap being formed at its outer end with an annular socket surrounding its discharge orifice and extending inwardly from its outer face with its inner wall —F⁵— arranged normally within the plane of the outer end of the nipple —F²— and said cap —F⁴— being provided on its interior face or periphery with a tapering seat —F⁶— movable into and out of contact with the inclined periphery —F³— of the nipple —F²— for regulating the flow of the steam from the interior of said nipple.

6. The combination with the burner —F— provided with a central hydrocarbon passage —f^2— having a reduced nipple at its outlet end and with an outer steam passage —f^3— parallel with said central passage, an exterior screw threaded shoulder on said burner, and a cap adjustably mounted on said shoulder

for incasing the nipple; of a vertical branch passage —f^5— leading from the steam supply to said outer passage, a horizontal branch passage —f^4— leading from the hydrocarbon supply across said central passage between the ends of the latter, and a valve movable in said horizontal branch passage across the central passage, as and for the purpose set forth.

7. The herein described chamber for heating apparatus, the same comprising upright sides having an opening in one side for the reception of the article to be heated and an opening in another side for registration with the burner, a corrugated bottom wall, a removable cap, a steam conduit arranged within said walls opposite to the opening for the burner, a pipe discharging from the upper portion of the steam conduit formed with a bent extremity arranged at one side of the opening for the burner, substantially as and for the purpose specified.

8. The herein described chamber for heating apparatus, the same comprising upright sides having an opening in one side for the reception of the article to be heated and an opening in the other side for registration with the burner, a corrugated bottom wall, a removable top, a steam conduit arranged within said walls opposite to the opening for the burner, a pipe discharging from the upper portion of the steam conduit formed with a bent extremity arranged at one side of the opening for the burner, and a combustion tube mounted on said pipe and registered with the opening for registering with the burner, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Rochester, in the county of Monroe, in the State of New York, this 29th day of February, 1892.

CARL A. BURT.

Witnesses:
J. W. KEYS,
EMILIO LASTRETO.