

No. 763,847.

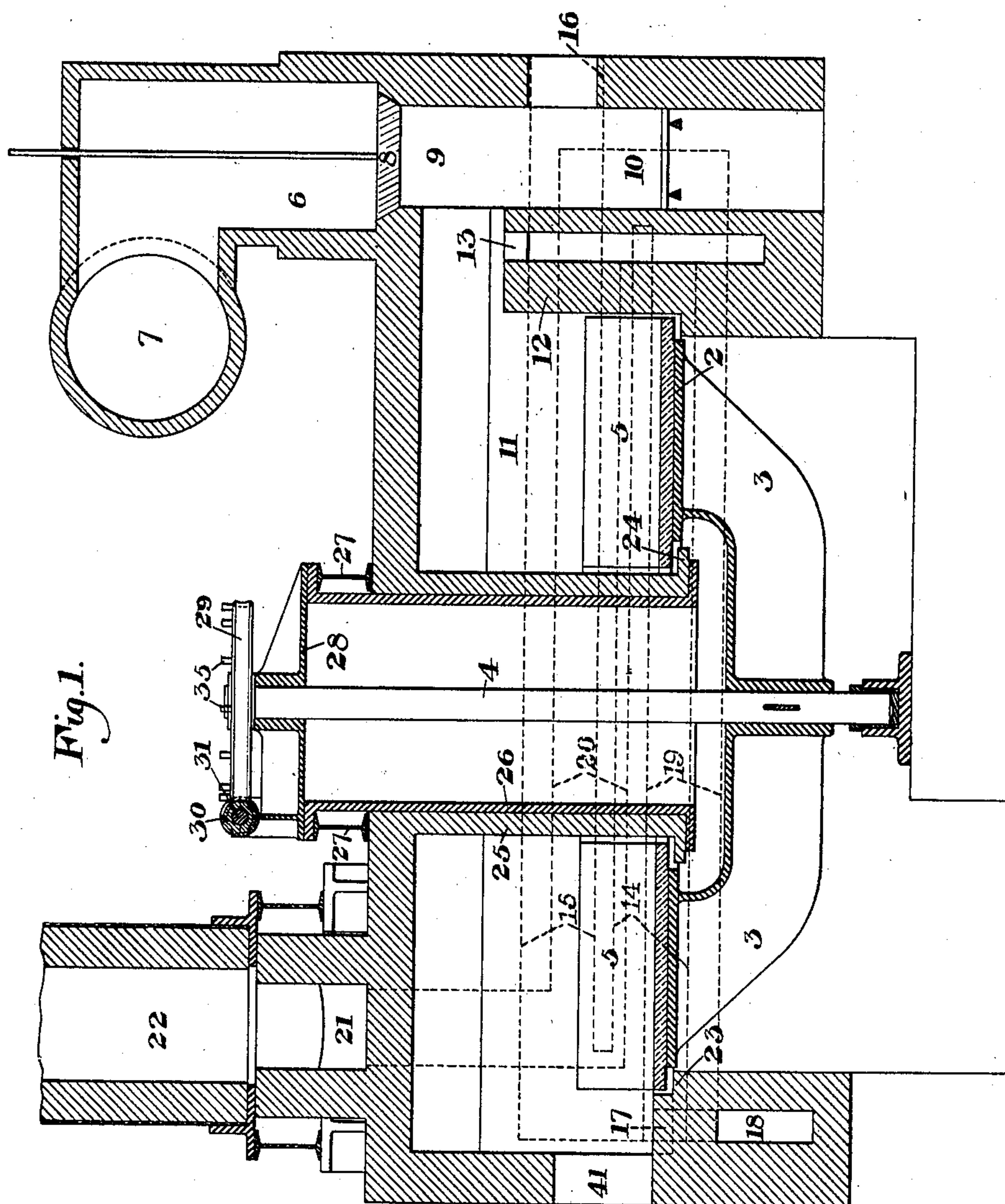
PATENTED JUNE 28, 1904.

C. W. BRAY.
HEATING FURNACE.

APPLICATION FILED MAR. 19, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

Warren W. Swartz
H. M. Corbin

INVENTOR

C. W. Bray
by Markwell & Markwell
his attys.

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3 SHEETS—SHEET 2.

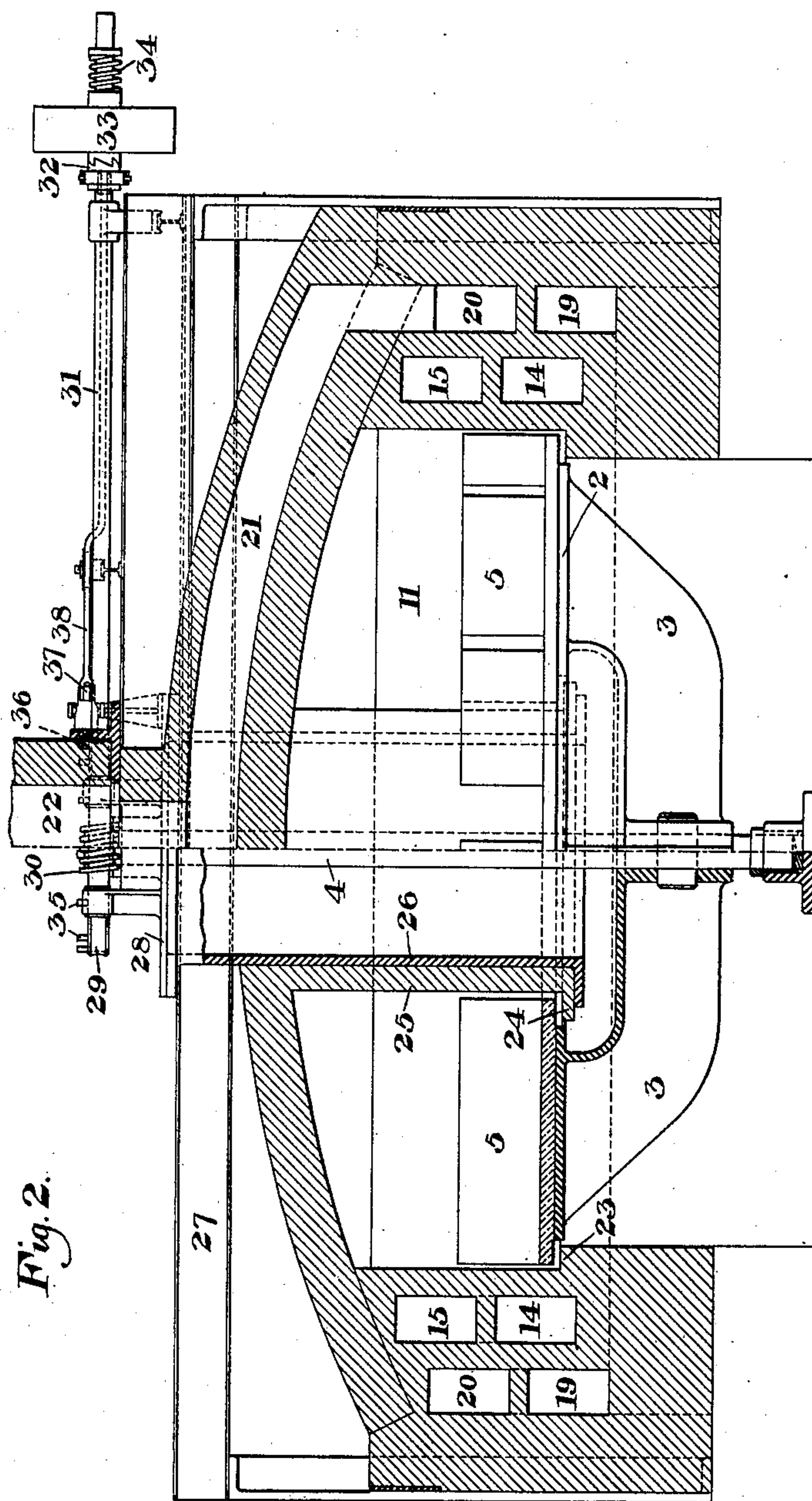


Fig. 2.

WITNESSES

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INVENTOR.

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No. 763,847.

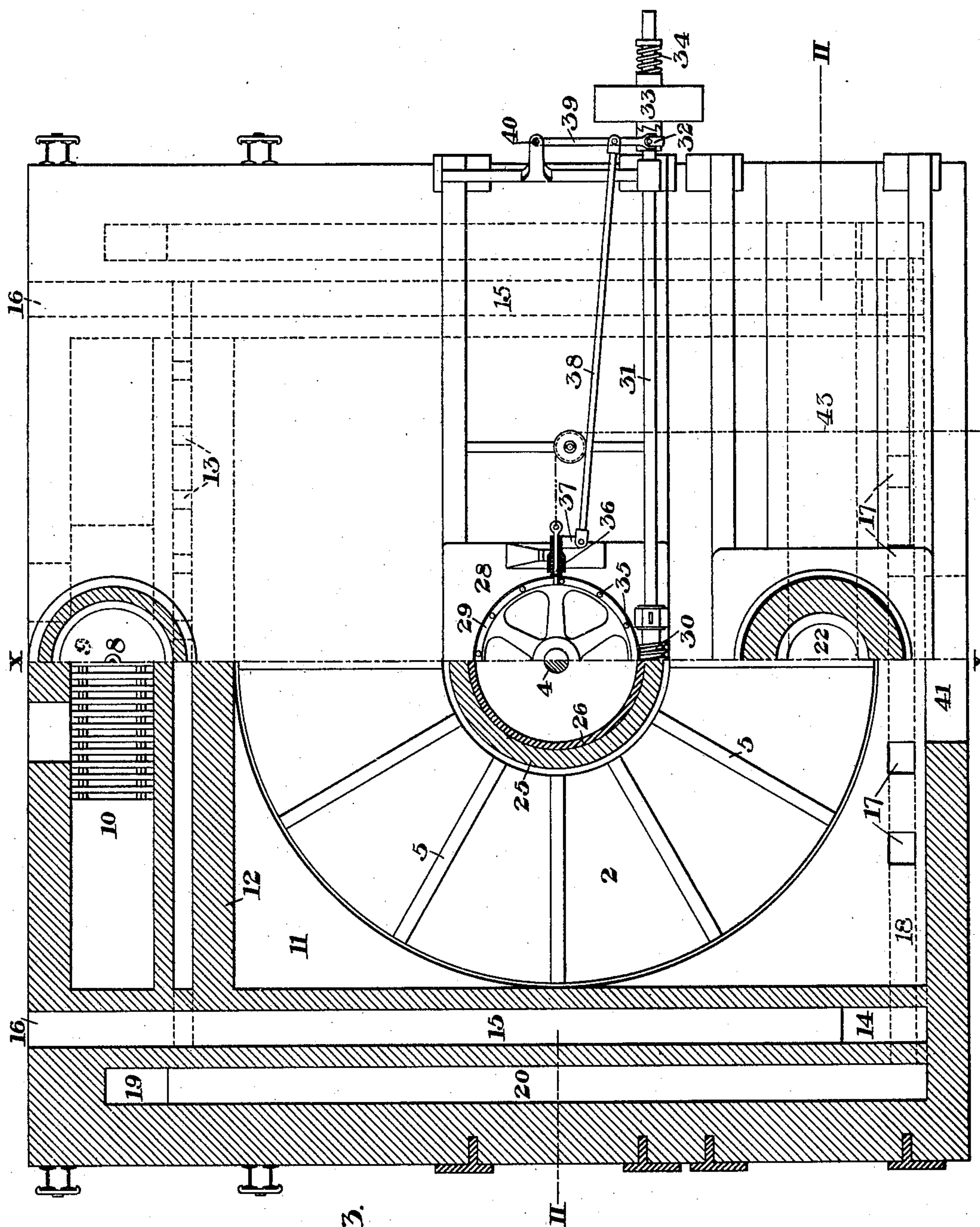
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NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES

Warren W. Swartz
St. M. Corwin

Fig. 3.

INVENTOR

C. W. Bray
by Baker & McNeill
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UNITED STATES PATENT OFFICE.

CHARLES W. BRAY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
AMERICAN SHEET AND TIN PLATE COMPANY, OF PITTSBURG,
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HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 763,847, dated June 28, 1904.

Application filed March 19, 1901. Serial No. 51,834. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BRAY, of
Pittsburg, in the county of Allegheny and
State of Pennsylvania, have invented a new
and useful Heating-Furnace, of which the fol-
lowing is a full, clear, and exact description,
reference being had to the accompanying
drawings, forming part of this specification,
in which—

Figure 1 is a vertical cross-section of my
improved furnace, taken on the line X X of
Fig. 3. Fig. 2 is a vertical cross-section on
the irregular line II II of Fig. 3; and Fig. 3
is a top plan view of my improved furnace,
the left-hand half being shown in horizontal
section.

My invention relates to the heating of metal,
and particularly to the reheating of plates and
sheets, such as the packs formed in the reduc-
tion of black plates and sheets for tinning;
and its object is to provide a furnace in which
the heat shall be applied evenly and uniformly
to the metal while resting upon an endless
carrier, preferably of annular form.

A further object is to provide for an auto-
matic intermittent movement of the carrier,
which moves step by step, allowing the in-
sertion of a series of sheets during each inter-
val of rest.

In the drawings, 2 represents an annular
table or platform, which may be formed of
metal plates or castings carried on brackets
3, the inner ends of which are secured to the
vertical shaft 4. The table is divided into
compartments or chambers by radial parti-
tions 5, and blocks or supports may be pro-
vided on the table, where the sheets or packs
are laid horizontally, though I prefer to set
the packs in a vertical or slanting position
between and resting against the partitions.
This annular support or carrier is inclosed
within a square or rectangular furnace struc-
ture having at the front a gas-supply branch
6, leading from the gas-main 7 and controlled
by a valve 8. This gas-supply channel leads
downwardly into a chamber 9, containing a
grate or fireplace 10 and between which and
the annular fire-chamber 11 is a hollow bridge-

wall 12. The bridge-wall is provided with a
series of upwardly-directed air-ports 13, com-
municating with its cavity, and from either
end of the cavity lead horizontal air-flues 14,
which connect at their opposite ends with air-
flues 15, located above them in the side walls
and connecting with the open air through
ports 16.

The products of combustion after passing
through the heating-chamber enter ports 17,
leading into a horizontal channel 18, which
connects at both ends with horizontal flues 19
outside of and parallel with the air-flues.
The ends of the flues 19 connect with parallel
upper gas-flues 20, which at their opposite
ends connect with stack-flues 21, leading to the
common stack 22. By this double-surface re-
generator system the air entering the furnace
passes forward through the upper air-flues,
thence backward into the second and lower
air-flues, and thence to the hollow bridge-wall,
and in this tortuous course the air is heated
by the outgoing gases, which are also given
a tortuous course in the opposite direction on
their way to the stack.

To hold the heat and gases within the fur-
nace-chamber, the annular carrier or platform
preferably overlaps a circular ledge 23, ex-
tending around the platform, and its inner
edge similarly overlaps a refractory ledge 24,
extending laterally from a refractory cylinder
25, surrounding a metal cylinder 26, depend-
ing centrally within the furnace-chamber and
carried on I-beams or suitable supports 27.
The central shaft extends upwardly through
this cylinder and through a bearing in the top
plate 28, and to its upper end is secured a
worm-wheel 29, engaged by worm 30 on shaft
31, having a clutch connection 32 with a driven
pulley 33, loosely mounted on this shaft. The
clutch member is drawn forward by spring
34, so as to engage the other clutch member
and cause a rotation of the shaft. To the top
of the worm-wheel are secured a series of pins
35, which are arranged to engage a spring-
pressed pin 36, extending through a bearing
in bell-crank lever 37, pivoted to the top plate
of the furnace. The other arm of this bell-

crank lever is connected by link 38 with a lever 39, pivoted to the frame of the furnace at 40 and forked at its other end to engage the clutch member of the worm-shaft, engaging a pin projecting from a collar carried in a groove on this clutch member.

In the operation of the furnace, the pulley being constantly rotated, the annular support will be turned within the furnace-chamber until one of the pins on the worm-wheel engages the spring-pressed pin on the bell-crank lever. The bell-crank lever will then be swung and will swing the clutch-lever, so as to disengage the clutch in opposition to the action of the spring. After the clutch-teeth have thus been disengaged movement of the carrier will cease until the operator pulls the cord 43 and draws back the pin, thus allowing the spring to throw in the clutch, the pin then being in position to engage the next pin in the carrier. The spring will then immediately snap the clutch into closed position and rotation will take place until the next pin is reached, when the carrier will again stop automatically. During the periods of rest the operator removes a heated pack from a compartment of the carrier through the opening 41 and inserts a new pack in its place. Each pack thus passes through the entire circuit of the carrier before its removal and is thus evenly and thoroughly heated. In starting the operation of the furnace a fire is started upon the grate and continued until a draft is set up, when the gas is admitted and the fire allowed to die out. During this operation of the furnace the heat of the outgoing products is util-

ized in heating the incoming air and an economical operation thus afforded. The heated air passing up through the bridge-wall unites with the gas entering through the port above this bridge-wall and gives an even and intense flame.

Many changes may be made in the form and arrangement of the furnace, the carrier, and the driving connections without departing from my invention.

I claim—

1. A metal-heating furnace, comprising a horizontal rotary carrier, an unobstructed heating-chamber over said carrier, heating means at one side of said carrier, and arranged to deliver products of combustion on the upper side of said carrier, an outlet for waste products of combustion at the opposite side of said carrier, an air-inlet flue, extending through the walls of the furnace to said heating means, and a stack-flue leading from said outlet and arranged adjacent to said air-inlet flue, substantially as described.

2. A metal-heating furnace having a rotary carrier, means for driving said carrier, and a stop mechanism, comprising detents, revolvable with said carrier, and a clutch for said driving means, having a controlling member movably arranged in the path of said detents, substantially as described.

In testimony whereof I have hereunto set my hand.

C. W. BRAY.

Witnesses:

H. M. CORWIN,
GEO. B. BLEMING.