

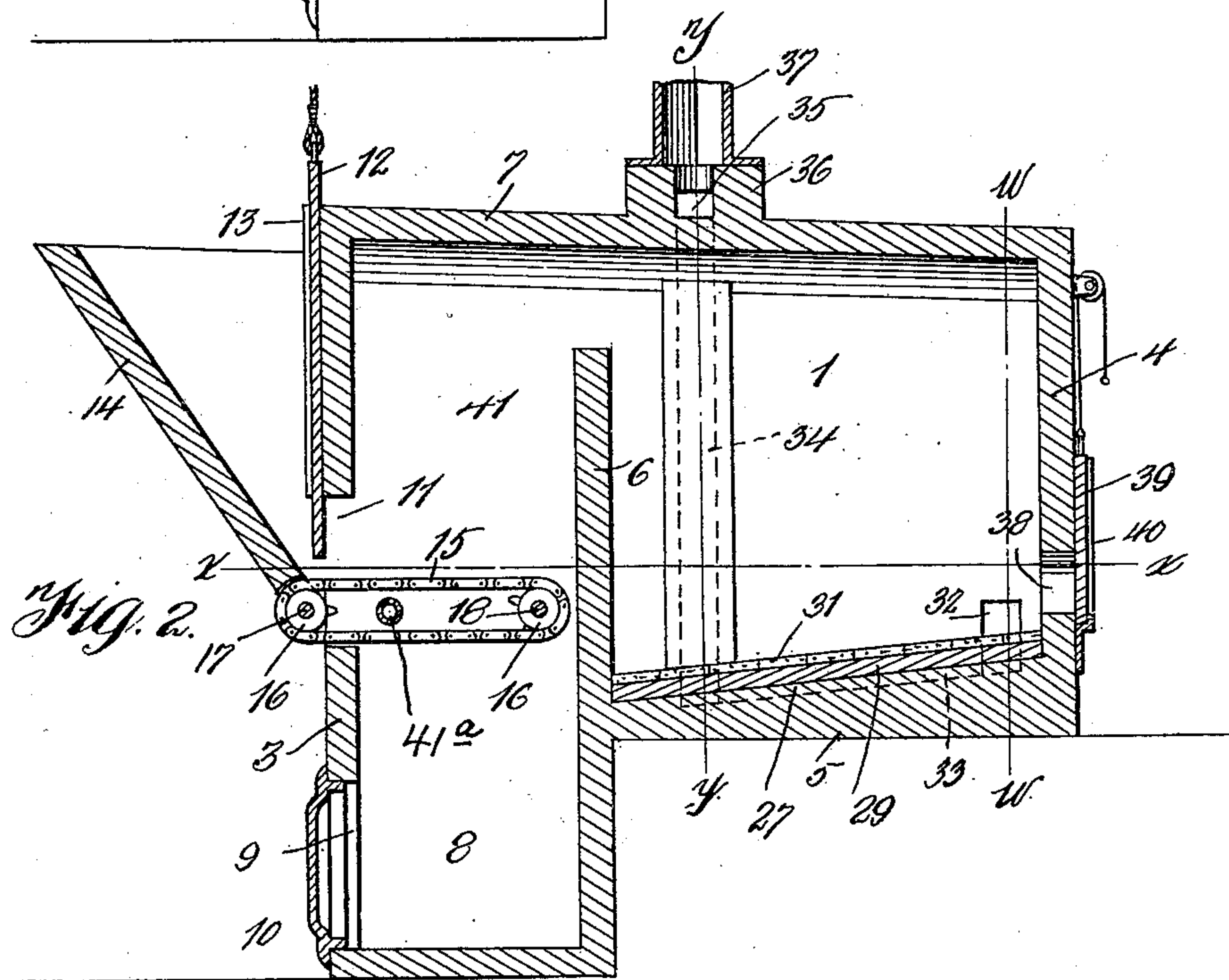
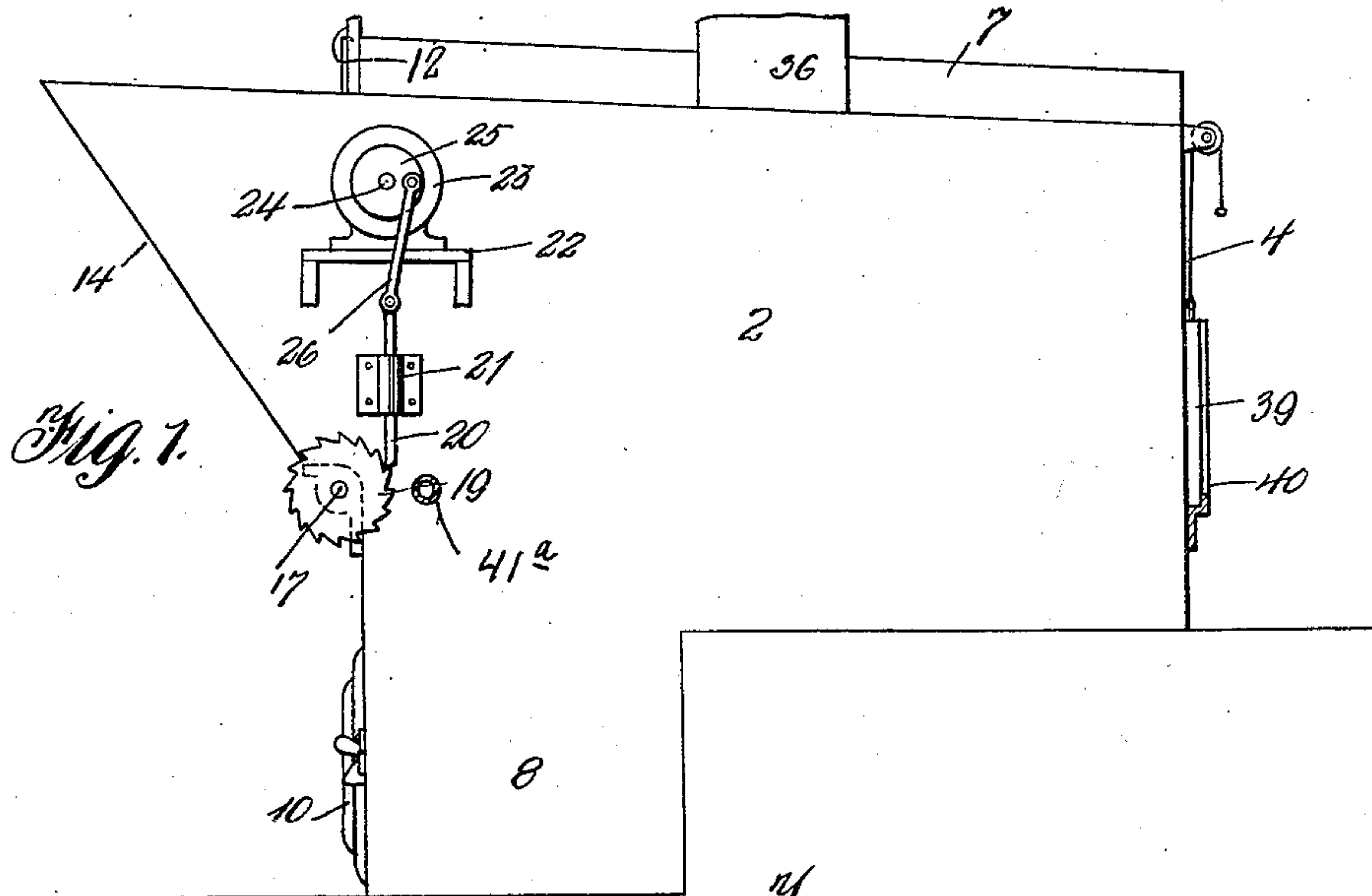
D. C. ARTMAN.
FURNACE.

APPLICATION FILED OCT. 24, 1908.

923,478.

Patented June 1, 1909.

2 SHEETS—SHEET 1.



Inventor

D. C. Artman.

Witnesses

Samuel Payne.

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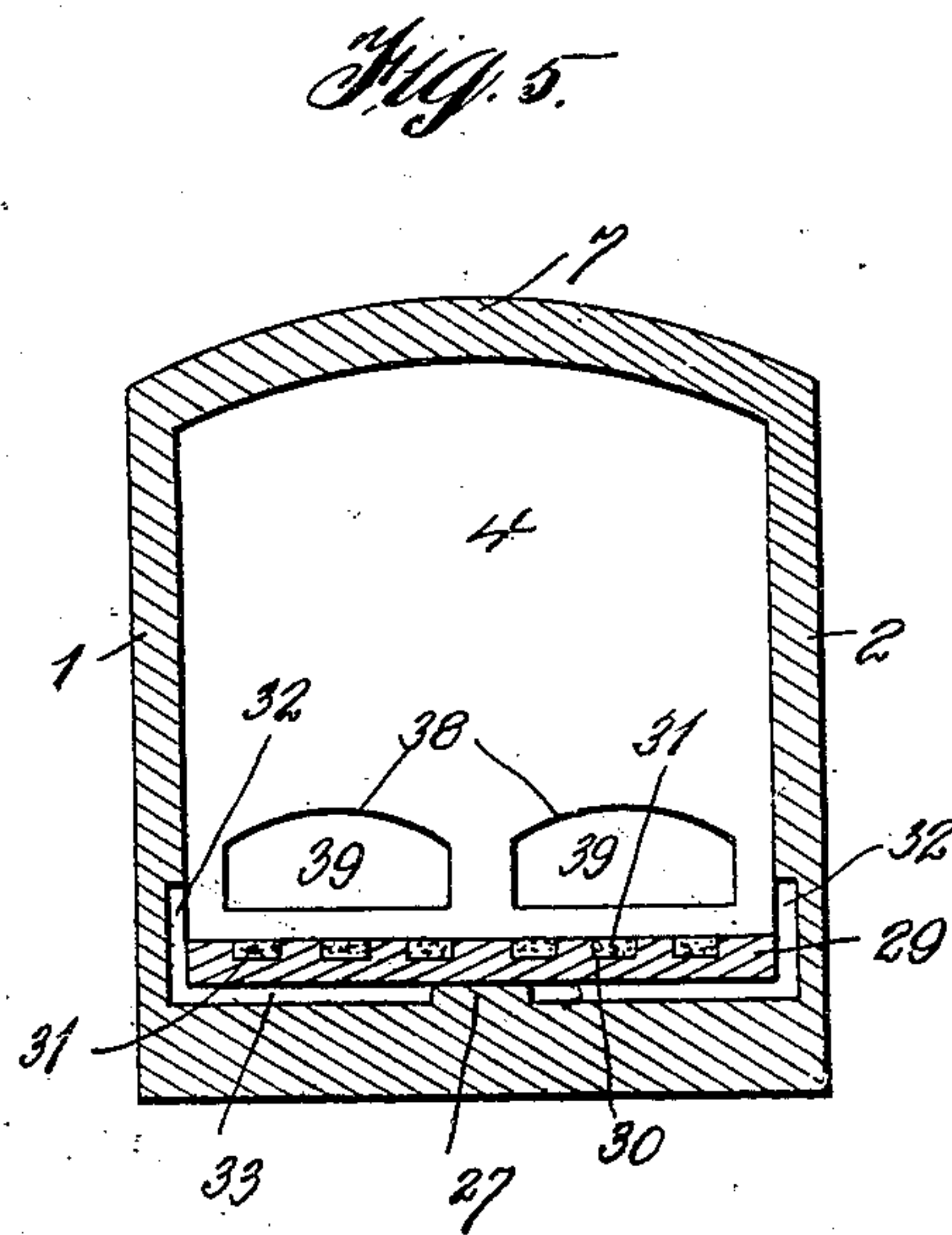
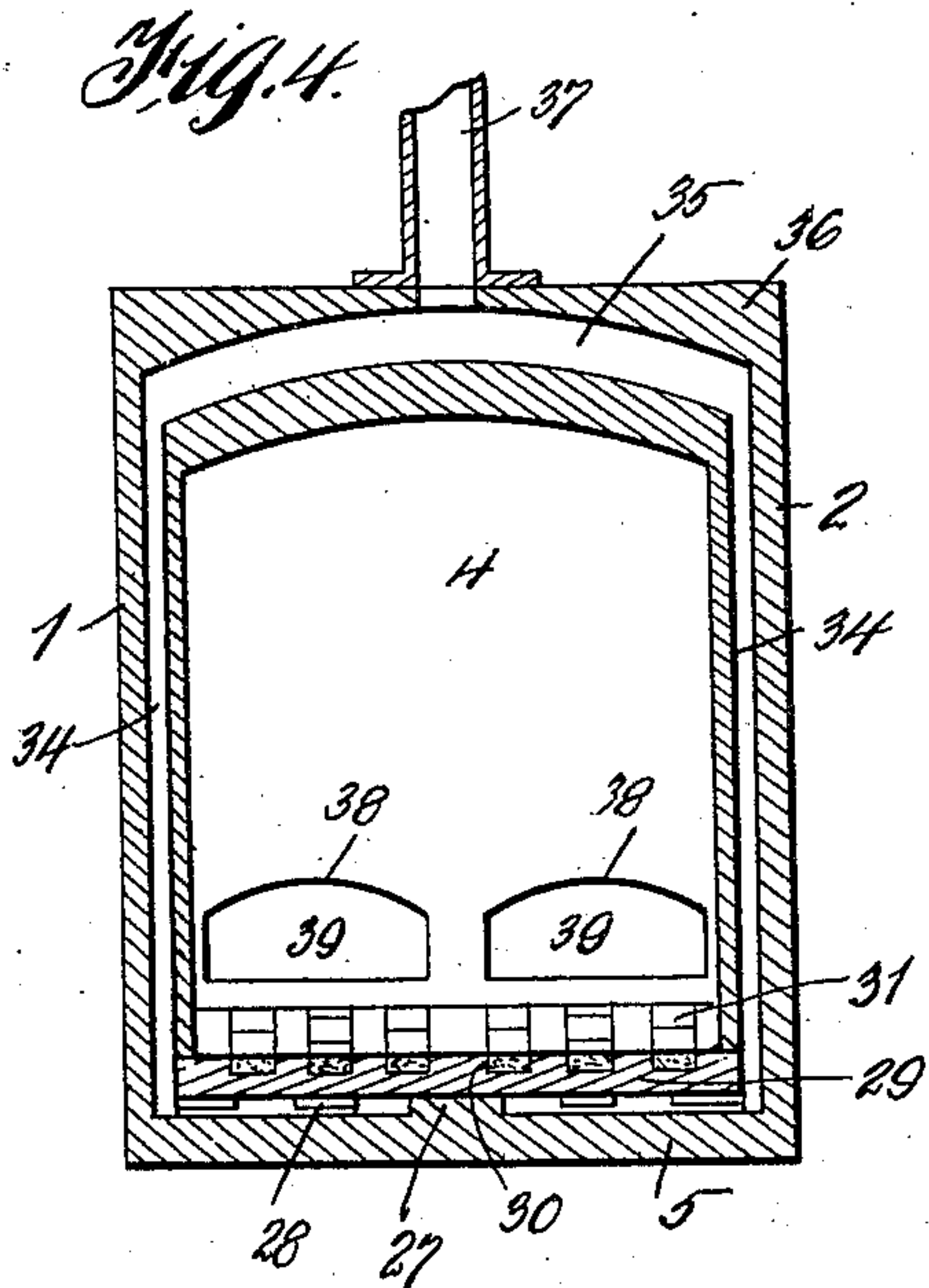
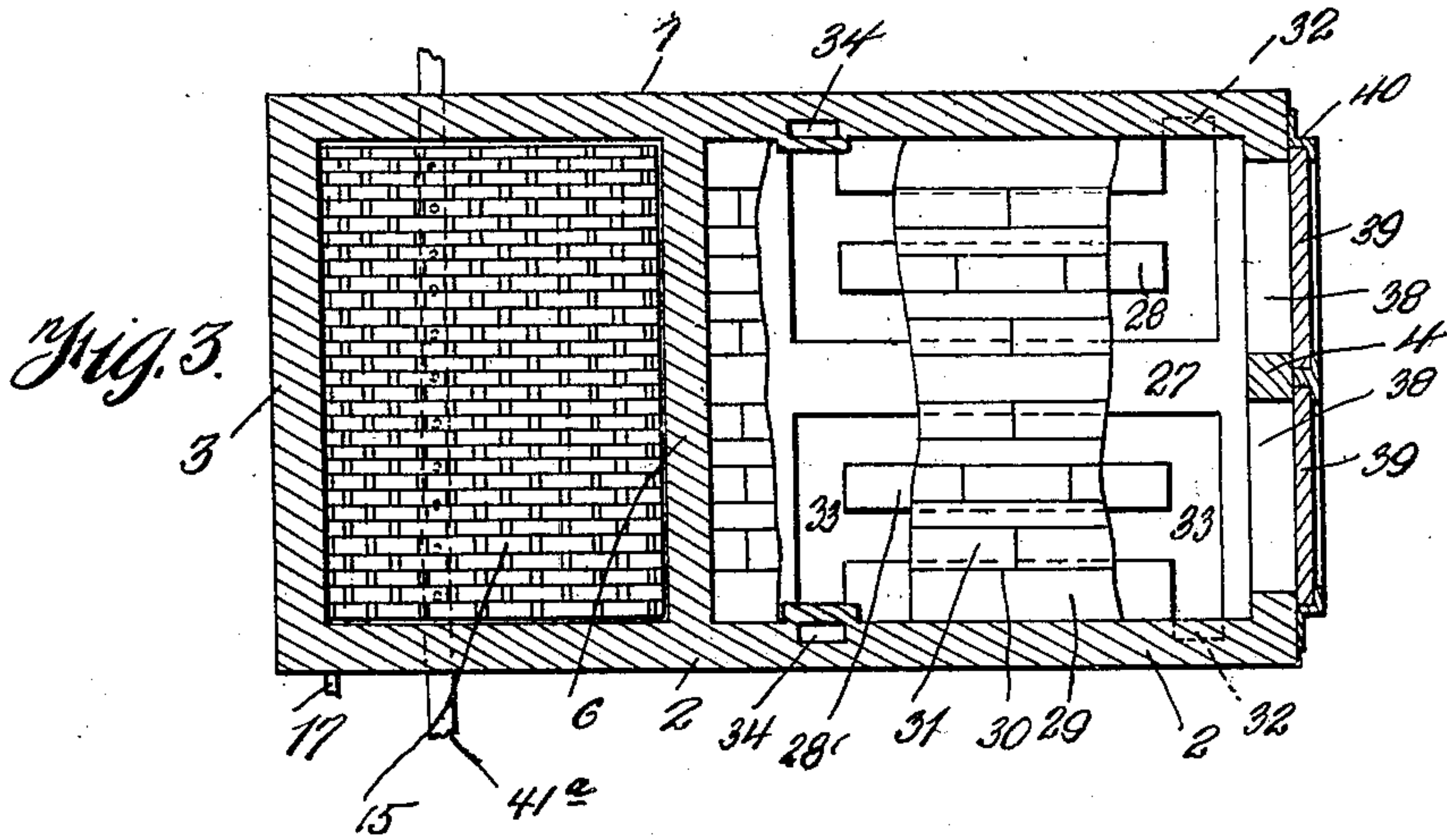
Attorneys

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DAVID CYRUS ARTMAN, OF TARENTUM, PENNSYLVANIA.

FURNACE.

No. 923,478.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed October 24, 1908. Serial No. 459,303.

To all whom it may concern:

Be it known that I, DAVID CYRUS ARTMAN, a citizen of the United States of America, residing at Tarentum, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to furnaces, and the primary object of my invention is the provision of novel means in connection with the furnace structure for obtaining a maximum of heat units from a minimum expenditure
15 of fuel.

Another object of my invention is to provide a furnace that can be advantageously used in mills for heating sheets of metal, or similar metallic products, the sheets being
20 subjected to a high degree of heat occasioned by the novel arrangement of the flues.

Another object of this invention is to provide a furnace with an endless and movable grate bar, together with novel means for in-
25 termittently moving the bar.

A further object of this invention is to provide a furnace structure with a circuitous conduit for the heat units, products of combustion, and fumes and smoke, before their
30 final escape, whereby a maximum degree of heat can be obtained in a portion of the furnace structure, and the heat used for various purposes, as a generator of steam in coils or tubes arranged in the furnace.

35 With the above and other objects in view which will more readily appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be presently de-
40 scribed and then claimed.

In the drawings, Figure 1 is a side elevation of a furnace constructed in accordance with my invention, Fig. 2 is a longitudinal sectional view of the same, Fig. 3 is a hori-
45 zontal sectional view of a furnace taken on the line $x-x$ of Fig. 2, the bottom of the furnace being partly broken away, Fig. 4 is a transverse sectional view of a furnace taken on the line $y-y$ of Fig. 2, and Fig. 5 is a similar view taken on the line $w-w$ of Fig. 2.

50 In the accompanying drawings I have illustrated an oblong structure comprising side walls 1 and 2, a front wall 3 and a rear

wall 4, said structure having an inclined bottom 5 provided at the forward end thereof 55 with a bridge wall 6, said bridge wall being formed integral with the side walls 1 and 2 and extending approximately to the arched roof 7 of the furnace structure.

At the forward end of the furnace structure, the front wall 3, side walls 1 and 2 and bridge wall 6 extend downwardly to provide an ash pit 8; the front wall 3 being provided with a suitable door way 9 and door 10 where by easy access can be had to the pit 8. The 65 front wall 3 is cut away to provide a coal opening 11, which is partially closed by a gate 12 slidably mounted between vertical guides 13 arranged in a coal chute 14, this chute being formed by an extension of the 70 side walls 1 and 2 or made of metal and secured to the front wall 3.

Arranged between the front wall 3 and the bridge wall 6 and extending into the opening 11 is a horizontal endless and movable grate 75 15, said grate being of a conventional form comprising a plurality of pivoted links or bars. This grate in its entirety is supported upon sprocket wheels 16 mounted upon shafts 17 and 18 journaled transversely of the 80 furnace structure. The shaft 17 protrudes from the furnace structure and is provided with a ratchet wheel 19. Engaging said ratchet wheel is a pawl 20 slidably mounted in a keeper 21 secured to the side wall 2 of the 85 furnace. This side wall of the furnace is provided with a bracket 22 for supporting an electric motor 23, the armature shaft 24 of said motor having an eccentric 25 which is connected by a pitman 26 to the upper end of 90 a pawl 20. When the motor 23 is placed in operation, the pawl 20 is vertically reciprocated to intermittently move the ratchet wheel 19 and the grate 15, whereby coal admitted to the grate from the chute 14 will be 95 gradually carried toward the bridge wall 6, and during this movement consume the residue ordinarily precipitated into the ash pit 8.

The bottom 5 of the furnace structure is provided with longitudinal ribs 27 and 28 the 100 rib 27 being of a greater length than the ribs 28 and dividing the bottom of the furnace longitudinally, with one rib 28 between the rib 27 and the side wall 1, and the other rib 28 between rib 27 and the side wall 2. The 105 rib 27 and 28 support a metallic plate 29 hav-

ing longitudinal grooves 30 for fire brick or similar non-fusible material. The ribs 27 and 28 in connection with the floor plate 29 form a plurality of heating spaces below the plate and which are indicated by the reference numeral 33. The elongated rib 27 separates the heating space at one side of the bottom from those at the other side of the bottom.

10 The side walls 1 and 2 at the rear end of the furnace and adjacent to the floor plate 29 are provided with flues 32 communicating with the heating spaces 33 beneath the plate 29. The side walls 1 and 2 adjacent to the bridge wall 6 are provided with vertical flues 34, the lower ends of said flues communicating with the space 33 while the upper ends of said flues terminate in an arched flue 35 formed in a transverse housing 36, carried by the roof 7 of the furnace. The housing 36 intermediate the ends thereof is provided with an exhaust pipe 37.

To permit of easy access being had to the interior of the furnace structure, the rear wall 4 is provided with two openings 38 normally closed by doors 39 slidably mounted in guides 40 carried by the rear wall 4 of the furnace. Suitable means can be employed for facilitating the raising of doors 39, as shown in Figs. 1 and 2.

The heat units from the combustion chamber 41 of the furnace structure pass over the bridge wall 6 and rearwardly to the flues 32 escaping through said flues into the space 33, thus to the flues 34 and finally escaping through the flue 35 to the stack 37. It is apparent that the interior of the furnace structure is thoroughly heated before the heat units or products of combustion are allowed to escape.

In connection with the furnace a perforated air blast pipe 41^a can be used, this pipe extending transversely of the combustion chamber and through the endless grate arranged therein. This air blast pipe is employed to increase the combustion of coal upon the grate.

The entire furnace structure is made of a non-fusible material, and while in the drawings forming a part of this application, there is illustrated the preferred embodiments of my invention, I would have it understood that the details of construction can be varied or changed, as to the shape, proportion and manner of assemblage without departing from the spirit of the invention.

Having now described my invention what I claim as new, is;—

1. A sheet metal heating furnace comprising a combustion chamber and a heating chamber, bridge wall separating said chamber from said combustion chamber, said bridge wall of less height than the height of the heating chamber and constituting the

front wall of the heating chamber and the rear wall of the combustion chamber, said heating chamber comprising side walls, a rear wall, an inclined bottom and a roof, spaced ribs on the upper face of said inclined bottom, a floor plate mounted on said ribs and in connection with the latter forming heating spaces, fire-brick arranged in said floor plate, said side wall at the rear thereof having flues communicating with the heating spaces below said floor plate, said side walls further having flues formed therein adjacent to the bridge wall and communicating with the heating spaces between said floor plate and with an exhaust flue formed transversely of the roof, said end wall having openings formed therein, and doors for normally closing said opening.

2. A sheet metal heating furnace comprising a combustion chamber and a heating chamber, said heating chamber having an inclined bottom provided on its upper face with a plurality of ribs, one of said ribs being longer than the other, said elongated rib being positioned between the shorter ribs a floor plate mounted upon said ribs, said ribs forming in connection with said floor plate a plurality of heating spaces, the side walls of said heating chamber provided with flues communicating with the heating spaces below the floor plate, an exhaust flue, and flues communicating with the space below the floor plate and with said exhaust flue said longitudinal ribs separating the heating spaces at one side of the bottom from the heating spaces at the opposite side of the bottom.

3. A sheet metal heating furnace comprising a combustion chamber and a heating chamber, means for supplying fuel to said combustion chamber, a bridge wall separating the combustion chamber from the heating chamber, said heating chamber having an inclined bottom provided with a plurality of spaced ribs said plate in connection with said ribs forming a plurality of heating spaces, a floor plate mounted upon said ribs, flues for establishing communication between the heating chamber and the heating spaces below the floor plate, an exhaust flue, flues for establishing communication between the heating spaces below the floor plate, and the exhaust flue, said heating chamber having one wall provided with openings whereby access can be had to said chamber, and means for closing said openings.

4. A sheet metal heating furnace comprising a combustion chamber and a heating chamber, said heating chamber having an inclined bottom provided on its upper face with a plurality of ribs, certain of said ribs being longer than the other said elongated rib positioned between the shorter ribs, a grooved floor plate mounted on said ribs and in connection with the ribs forming a plurality of heating

spaces, fire brick seated in the grooves of said plate, the side walls of said heating chamber provided with flues communicating with the heating spaces below the floor plate, an exhaust flue, and flues communicating with the heating spaces below the floor plate and with said exhaust flue said longitudinal ribs separating the heating spaces at one side of the

bottom from the heating spaces at the opposite side of the bottom.

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

DAVID CYRUS ARTMAN.

Witnesses:

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STEWART A. SHANNON.