

No. 753,793.

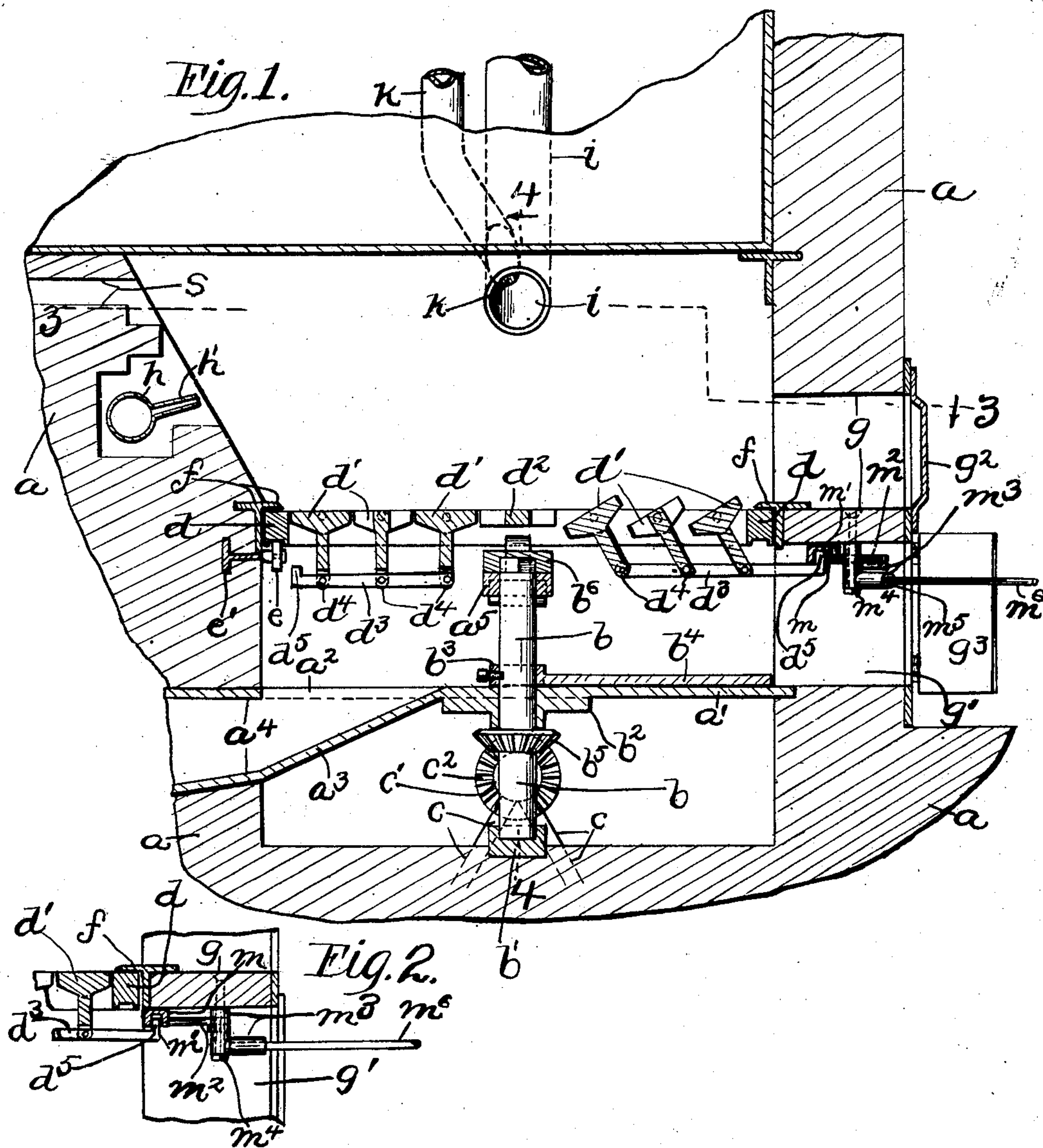
PATENTED MAR. 1, 1904.

F. GORMAN.
FURNACE.

APPLICATION FILED FEB. 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Victor C. Lynch.
G. M. Hayes.

INVENTOR

INVENTOR
Frank Gorman
BY
Lynch & Over,
His ATTORNEYS.

No. 753,793.

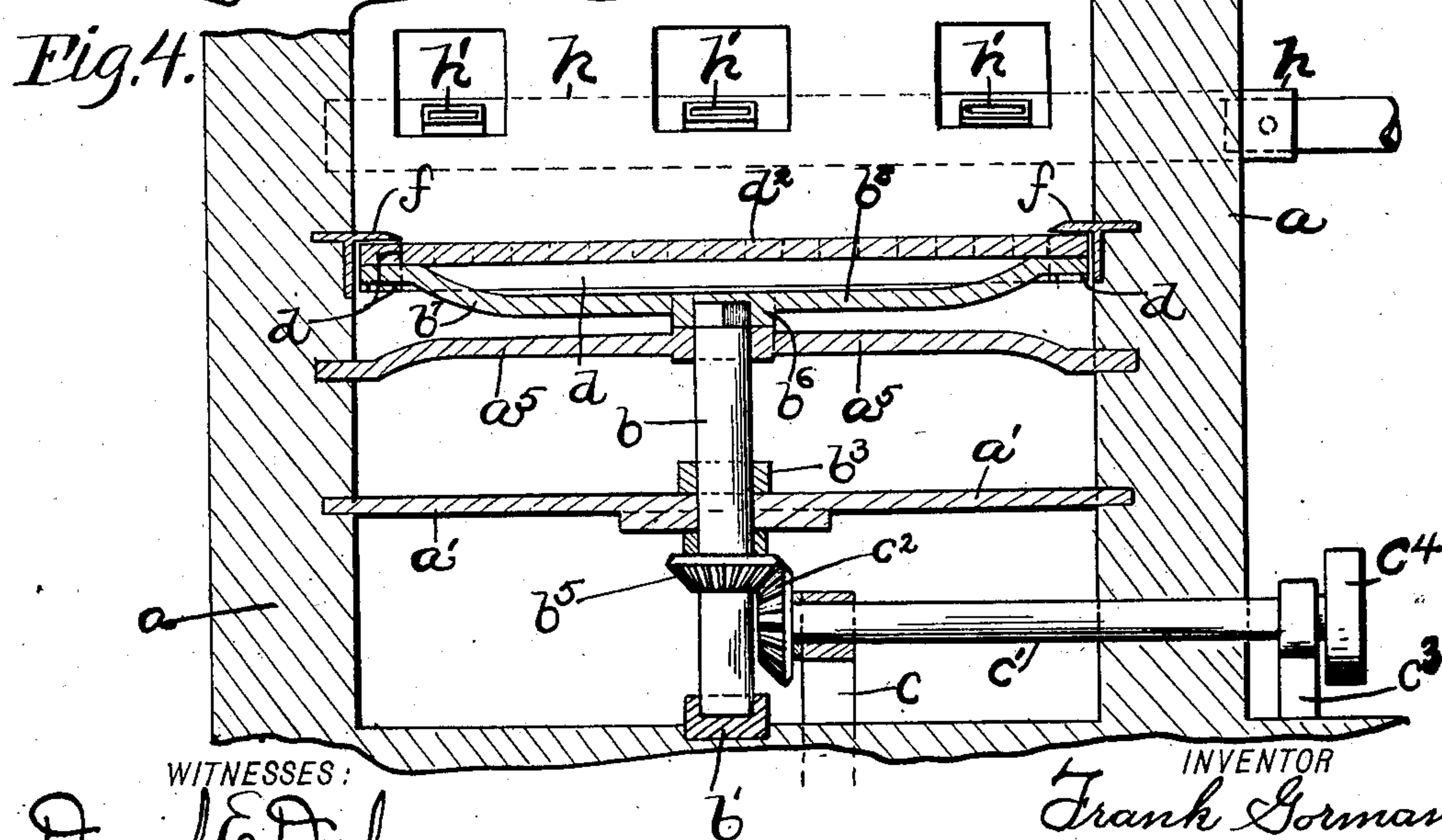
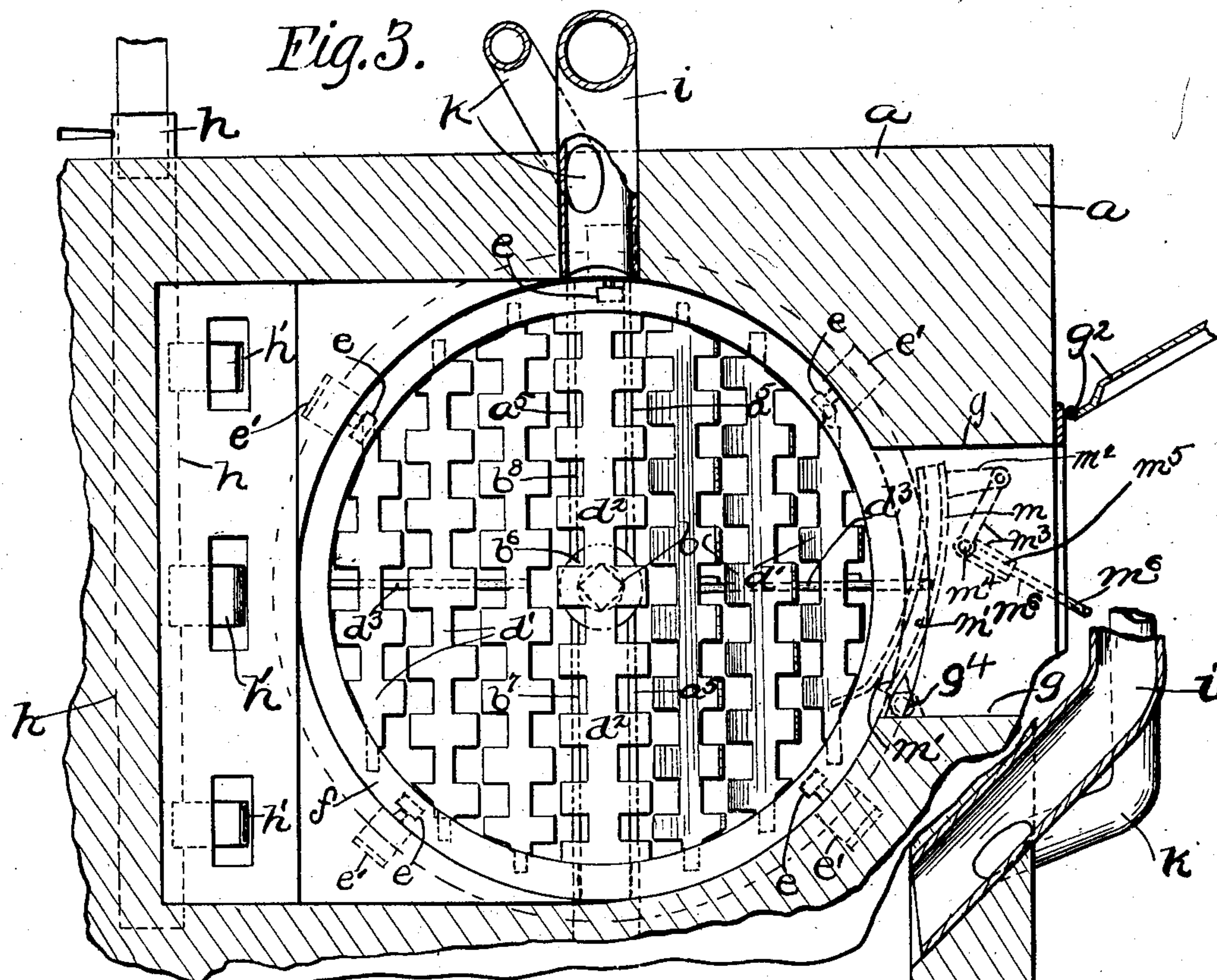
PATENTED MAR. 1, 1904.

F. GORMAN.
FURNACE.

APPLICATION FILED FEB. 24, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:
Daniel E. Daly.
Victor C. Lynch.

INVENTOR
Frank Gorman
BY
Lynch & Dorris
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK GORMAN, OF CLEVELAND, OHIO.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 753,793, dated March 1, 1904.

Application filed February 24, 1903. Serial No. 144,584. (No model.)

To all whom it may concern:

Be it known that I, FRANK GORMAN, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnaces; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in furnaces.

The object of this invention is to provide a furnace having a new and improved arrangement of parts whereby complete combustion of the fuel is secured, resulting in the abatement of all smoke and securing considerable economy in the consumption of fuel.

A further object of the invention is to provide means whereby the labor of operating the furnace is greatly lessened.

My invention therefore consists in providing new means for supporting and operating the grate so that it can be easily rotated in a horizontal plane, new means for rocking the grate-sections while the grate is being rotated, and means for preventing the accumulation of ashes in the ash-pit.

My invention also consists in the features of construction and combination of parts, as illustrated in the drawings and hereinafter described in the specification and pointed out in the claims.

In the accompanying drawings, Figure 1 is a central sectional view of my improved furnace. Fig. 2 is a detail view illustrating the device for rocking the grate-sections. Fig. 3 is a section on line 3 3, Fig. 1, with part broken away. Fig. 4 is a section on line 4 4, Fig. 1, with part broken away.

Again referring to the drawings, *a* represents the wall or body of the furnace-chamber. At a suitable distance above the bottom of the furnace-chamber is arranged a horizontal partition *a'*, which forms the floor of the ash-pit. An opening *a''* is formed in this floor *a'*, from which a chute *a'''* extends downwardly to an opening *a''''*, formed in the wall *a* of the furnace.

A vertical shaft *b* is arranged in the center

of the furnace-chamber and has its lower end mounted in a bearing formed in a plate *b'*, located in the bottom of the furnace, and its other end extends up through the partition *a'*. On the shaft *b*, close to the floor of the ash-pit, is secured a collar *b''*. An arm or bar *b'''*, approximately equal in length to the radius of the said floor, is formed integral with the collar *b''* and serves to scrape or brush the ashes from the floor of the ash-pit into the chute *a'''*. On the shaft *b*, below the floor of the ash-pit, is keyed a bevel-gear *b''''*.

In the bottom of the furnace-chamber in proximity to the vertical shaft *b* is arranged a standard or support *c*, in which is formed a bearing for one end of a horizontal shaft *c'*. The other end of the shaft *c'* extends out through the wall of the furnace, where it is journaled in a standard *c''*. On the outer end of the shaft *c'* is mounted a drum *c'''*, which is operatively connected with means suitable for rotating or driving the shaft *c'*. A bevel-gear *c''''* is keyed to the end of the shaft *c'* and arranged to mesh with the gear *b''''*, keyed to the vertical shaft *b*.

A truss or brace *a''''*, having a suitable bearing to accommodate the vertical shaft *b*, is mounted in the walls of the furnace above the ash-pit. This truss or brace serves to steady the said shaft and prevent any lateral movement thereof.

The upper end of the shaft *b* is preferably squared, and on this end is mounted a cap *b''''*, from which curved arms or supports *b'''''* and *b''''''*, formed integral therewith, extend outward and upward. On the ends of the arms *b'''''* and *b''''''* is mounted a circular grate, comprising an annular frame *d*, in which are pivotally mounted independent grate-sections *d'*. The central section *d''* is preferably mounted rigidly in said frame. The respective sections *d'* on each side of the central sections *d''* are connected by means of bars *d'''* and *d''''*, respectively, which are pivotally secured to lugs *d'''''*, which depend from the bottom of the respective sections *d'*. On the outer ends of the bars *d'''* are formed lugs *d''''''*.

Beneath the frame *d* of the grate is arranged a series of rollers *e*. These rollers are supported on brackets *e'*, arranged around the

wall of the furnace. The inner ends of the brackets e' are preferably T-shaped, so as to lock them in the wall, and on their outer or projecting ends are formed bearings for the rollers e . The bottom of the frame d is preferably grooved to form a track for the rollers. The object of these rollers is to give additional stability to the grate while the grate is being revolved.

10 An annular plate f is set in the wall of the furnace and is arranged to extend outwardly into the chamber of the furnace, so as to project or lap over the frame d . This plate prevents ashes or coal from falling down and
15 wedging between the frame d and the wall of the furnace.

In the wall of the furnace are formed the customary openings g and g' for giving access to the combustion-chamber and ash-pit, respectively. These openings are closed by means of doors g^2 and g^3 , respectively, of the usual construction.

My improved device for rocking the grate-sections is arranged as follows: To one of the
25 side walls of the openings g' is secured a plate m by means of a hinge g^4 , which allows the said plate to swing in and out horizontally under the grate. This plate is provided with a groove m' . To the plate m is rigidly secured
30 an arm m^2 , the end of which is hinged to one arm of a bell-crank lever m^3 , which is rotatably supported from the wall of the furnace by a vertically-arranged pin m^4 . In the other
35 end of the bell-crank lever is formed a socket m^5 , adapted to receive the end of a rod m^6 . At each half-revolution of the grate one or the other of the lugs d^5 will enter the groove m' in the plate m , and while the lug is traveling through the groove the sections of the grate
40 connected by the rod on which the lug is formed can be rocked by moving the rod m^6 back and forth across the opening g' .

Flues of the usual construction are arranged in the rear wall of the furnace. Below the
45 flues in the rear wall of the furnace is arranged a horizontal pipe h for carrying an air-blast. The pipe h is provided with nozzles h' .

i represents the coal-chute, and k represents an air-blast which opens into the coal-chute, near the mouth thereof, all of which is fully described in an application filed by me April 7, 1902.

What I claim is—

1. A furnace comprising, a casing, an annular frame rotatably supported in said casing, means for revolving said frame, grate-sections mounted in said frame, bars operatively connecting the grate-sections in each half of said frame, lugs formed on the ends of said bars, a plate supported from the wall of said casing and arranged so as to swing in and out under the said grate and provided with a groove arranged so that the lugs on the said bars will pass therethrough during a revolution of the said frame and means for causing said plate to move in and out under said frame.

2. In a furnace, the combination of a casing, a circular rotary grate mounted in said casing, said grate comprising an annular frame, grate-sections pivotally mounted in said frame, lugs secured to the bottom of said grate-sections, bars operatively connecting the grate-sections in each half of said grate, lugs formed on the ends of said bars, a plate supported from the wall of said casing and arranged so as to swing in and out under said grate and having a groove formed therein so that the lugs on the said bars will pass there-through during a revolution of the said grate, means for rotating said grate, means for causing said plate to move in and out under said grate, an annular plate mounted in the wall of said casing and arranged to project over the rim of said grate and rollers supported beneath said grate, substantially as described and for the purpose set forth.

In testimony whereof I sign the foregoing specification, in the presence of two witnesses, at Cleveland, Ohio.

FRANK GORMAN.

Witnesses:

VICTOR C. LYNCH,
G. M. HAYES.