

(No Model.)

W. R. RONEY.
FURNACE.

No. 409,650.

Patented Aug. 20, 1889.

Fig 1.

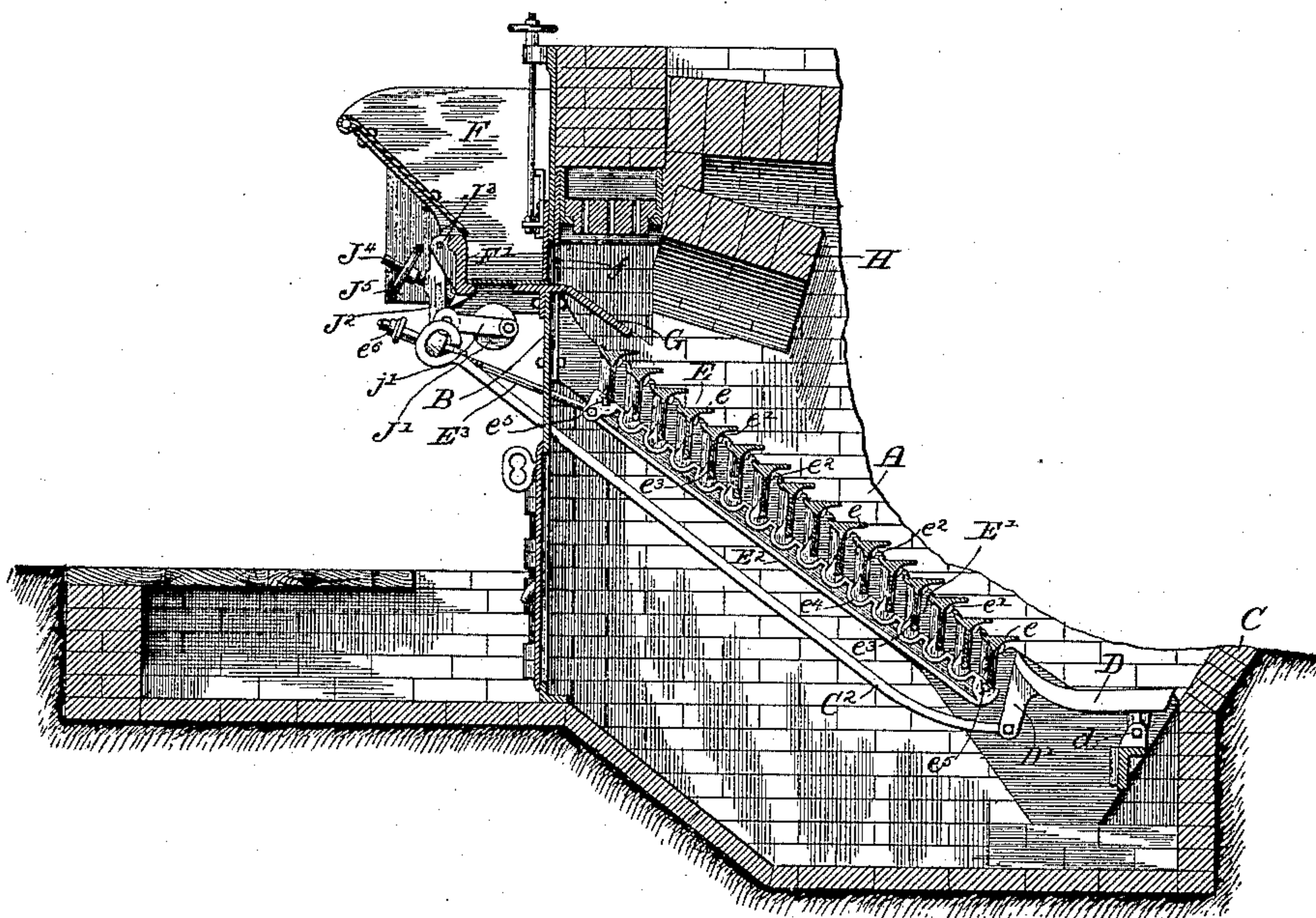


Fig 2.

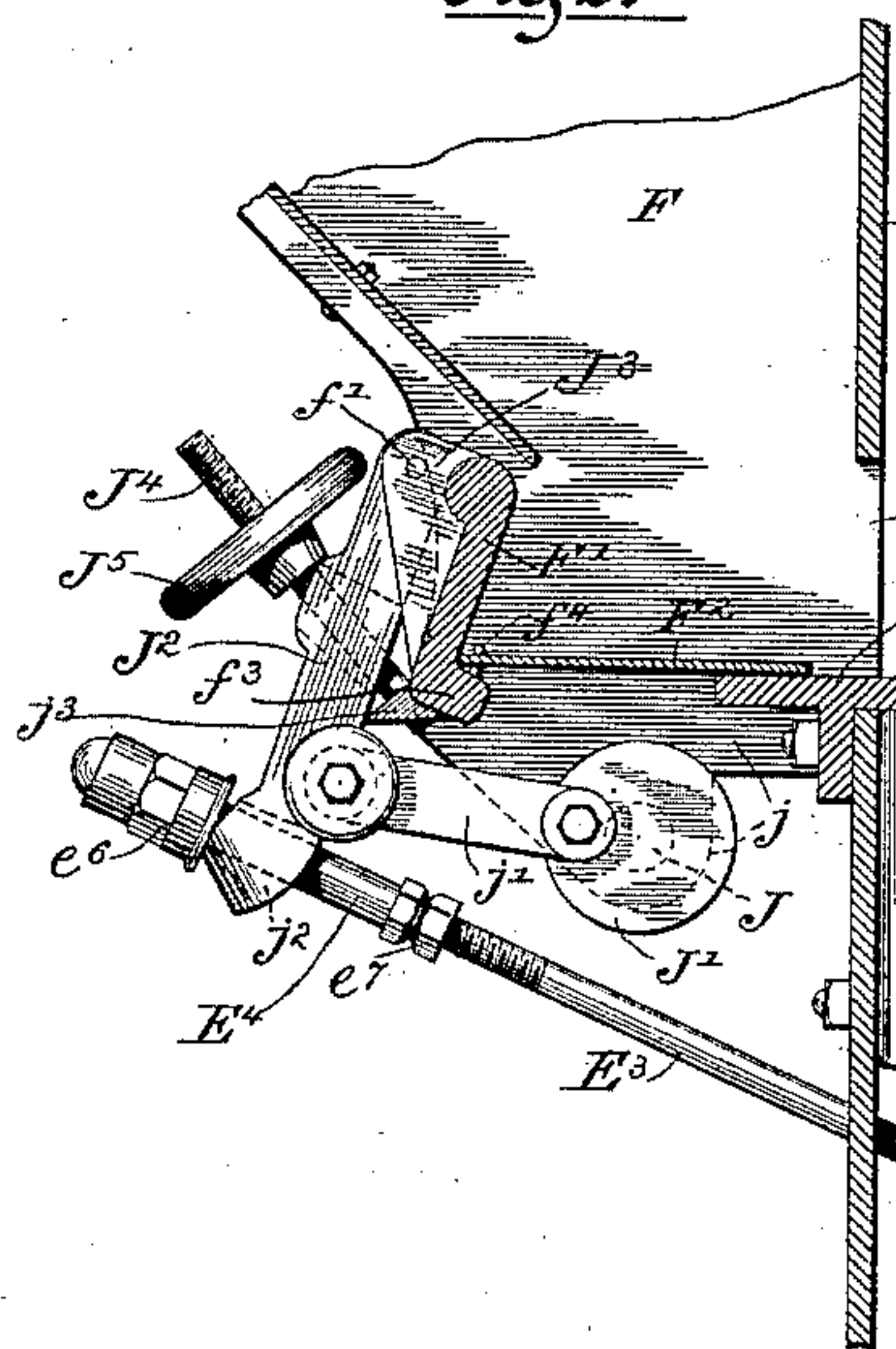
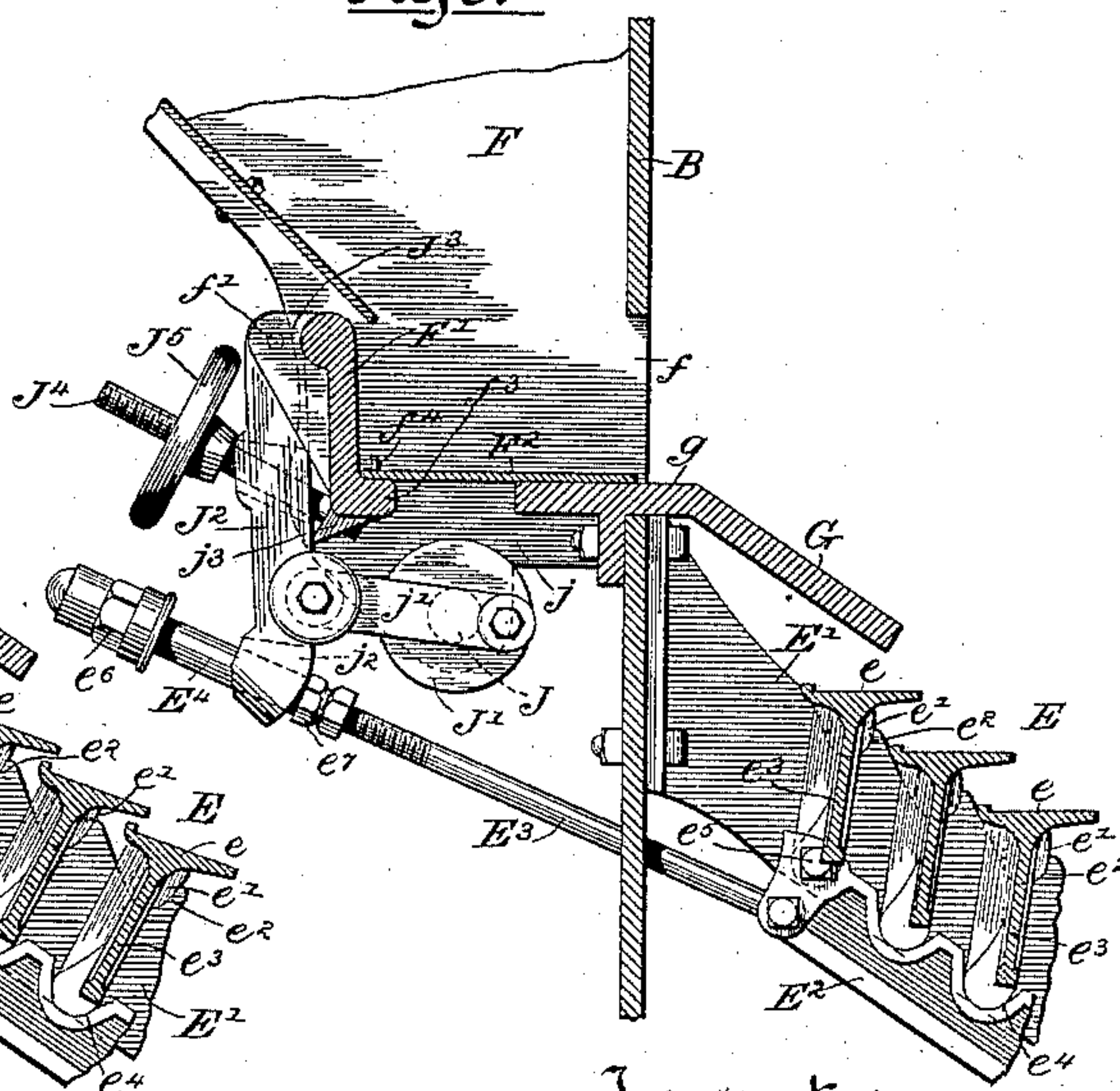


Fig 3.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM R. RONEY, OF CHICAGO, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 409,650, dated August 20, 1889.

Application filed April 1, 1889. Serial No. 305,526. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. RONEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of devices for feeding fuel to furnace-fires known as "mechanical stokers."

It has for its primary object to secure a more perfect coking of the coal or screenings on its way to the fire proper, together with a more perfect combustion of the gases emitted by the fuel, and therefore greater economy in the consumption of the fuel and less waste in the form of smoke or soot.

The invention embraces more particularly improvements in devices for advancing the fuel from the magazine to and along the grates, whereby the supply of fuel is rendered regular and continuous.

The main features of construction herein illustrated are shown and claimed in a separate application for patent, Serial No. 214,304, filed September 23, 1886, the present application covering certain features of construction shown, but not claimed, in said prior application.

In the accompanying drawings, illustrating my invention, Figure 1 is a central vertical longitudinal section of a furnace-grate containing my improvement with adjacent parts of a steam-boiler furnace. Fig. 2 is an enlarged sectional view more fully illustrating certain parts shown in Fig. 1. Fig. 3 is a view similar to Fig. 2, showing the same parts in a changed position.

In the said drawings, A indicates the side wall of the fire-box, B the front wall thereof, and C the rear or bridge wall.

D is a dropping or dumping grate located at the rear part of the fire-box.

E is an inclined grate located in front of and arranged to deliver upon the grate D, and F is an external hopper or magazine situated in position for the delivery of its contents upon the upper end of the inclined grate

E through a passage *f* in the front wall B of the fire-box.

G is an angular plate situated at the bottom of the passage *f* and extending over the uppermost bar of the grate E.

H is a fire-brick hood or arch overhanging the upper portion of the grate E and extending rearwardly and downwardly from the front wall of the fire-box above the passage *f*. The grate E is composed of a series of rocking transverse bars *e e*, resting at their ends *e'* in notches *e''* provided in the upper edges of stationary inclined supporting-bars *E'*. The upper surfaces of the grate-bars *e* are broad, flat, and continuous or non-fingered, and said bars are arranged in a stepped and overlapping position, so that the rear edge of one bar projects over the front edge of a subjacent bar, sufficient vertical space being provided between the overlapping edges to allow a rocking movement, such as is desirable or necessary to insure the proper feeding of the fuel thrown from front to rear of the grate.

The grate-bars *e e* are severally provided with depending arms *e'''*, which are engaged with a reciprocating rod or bar *E''*, by the movement of which the grate-bars *e e* may be rocked on their bearings in the bars *E'*. In the present instance the uppermost and lowermost grate-bars are pivoted at *e'''* to the bar *E''*, thus upholding the latter, and the arms of the intermediate grate-bars merely engage notches *e'''* in said bar *E''*. Other forms of engagement may of course be employed, if preferred. The rocking movement of the bars *e* is adjusted to bring the upper faces thereof at one extremity of their movement into a substantially horizontal position, as shown in Fig. 3, and at the opposite extremity of their throw into the inclined position shown in Fig. 2.

The grate D is preferably made with its bars running from front to rear, and is constructed to drop at its front edge, when desired. Said grate D is pivotally supported at *d*, and is provided near its forward edge with a depending arm *D'*, to the lower edge of which is pivoted a rod *C''*, extending to the front of the ash-pit, by which the fireman may lift and lower the grate. Said operating-rod *C''* is pro-

vided with one or more hooks or teeth, which may engage an edge of the front plate, through which the rod passes for holding the grate in its horizontal operative position. Said grate
 5 D herein illustrated is constructed in the manner shown and claimed in a prior application, Serial No. 278,592, filed June 29, 1888, and in itself forms no part of this present invention.

When the connecting-bar E^2 is reciprocated,
 10 it is obvious that coal or screenings or other fuel placed upon the inclined grate E will be intermittently carried along down the same in the progress of its combustion, and finally deposited upon the grate D in the manner
 15 clearly stated in said prior application, Serial No. 214,304.

The lower part of the magazine or hopper F is provided with an inwardly and outwardly movable front piece, follower, or pusher F' ,
 20 hinged to the ends of the hopper at f' . To the lower part of this pusher is loosely attached a bottom plate F^2 , which shares the inward and outward movement of the pusher and which forms a sliding bottom of the magazine. The inner edge of the bottom plate F^2
 25 in this instance rests and slides upon the horizontal portion g of the fixed plate G, and when the plate F^2 is retracted said horizontal part g forms a continuation thereof and a part
 30 of the bottom of the hopper. The bottom plate F^2 is shown as conveniently connected with the pusher F' by engaging pins f^4 in an inwardly-directed flange f^3 , which pins are inserted loosely through holes in the bottom
 35 plate. These parts operate in the same manner as described in said prior application, Serial No. 214,304, to allow the fuel or screenings to fall into the lower part of the hopper when the pusher is retracted and to force the fuel
 40 inwardly upon the inclined grate when the pusher is advanced.

J is a rotating horizontal shaft supported in brackets j beneath the hopper. Upon the
 45 said shaft J is attached an eccentric or crank disk J' . This crank-disk or eccentric is connected by a rod j' with a vibrating vertical arm J^2 , which is here shown as pivoted at its upper end to an outwardly-projecting lug J^3 upon the pusher F' , but which may be pivoted
 50 elsewhere. The reciprocating bar E^2 is connected with the arm J^2 at a suitable point by means of a connecting-rod E^3 , which desirably passes through a slot j^2 in the arm J^2 , and is provided with nuts e^6 e^7 on opposite
 55 sides of said arm for adjustment of the throw of the grate-bars or to allow for lost motion between said bars and their actuating devices, if desired. By means of these movable nuts on the rod E^3 the grate-bars may be given a
 60 variable range of oscillation, or they may be

oscillated between variable initial and terminal positions, according to the requirements of the particular kind of coal that is being used. By the same devices of course the period of time in which the grates are allowed to
 65 remain without motion may also be varied by variation of the space between the nuts.

The rod E^3 is herein shown as provided with a sleeve E^4 , interposed between the nuts e^6 e^7 around the rod E^3 to take the wear resulting
 70 from the rubbing contact with the lever J^2 in the manner described in said prior application, Serial No. 278,592.

A screw J^4 is secured to the pusher F' and is provided with a hand-wheel J^5 , and passes
 75 through a slot or opening in the said arm J^2 , so that the hub of the hand-wheel bears against the outer surface of the arm. A lug or projection j^3 on the lower end of the pusher bears against the inner surface of said arm J^2 . Said
 80 screw J^4 serves as a means of detachably securing the arm J^2 to the pusher, so that the latter will move with the arm when vibrated, and the hand-wheel J^5 affords a means of ad-
 85 justing the extent to which said pusher is moved through the medium of the reciprocating arm.

By varying the speed of the shaft J, when the latter is run by power, any desired rapidity of fuel supplied to the grates may be ob-
 90 tained, as fully set forth in said prior application, Serial No. 214,304.

I claim as my invention—

1. The combination, with the rocking grate-bars and reciprocating bar connected there-
 95 with, of an oscillating part or arm having a uniform range of movement and a rod connecting the reciprocating bar with the said oscillating part or arm and having adjustable connection with the latter, whereby the bars
 100 may be given a variable range of oscillation, substantially as described.

2. The combination, with the rocking grate-bars and reciprocating bar E^2 , connected there-
 105 with, of a power-vibrated bar J^2 , having a uniform range of movement and provided with an aperture, and a connecting-rod attached to said reciprocating bar, passing through the aperture in the vibrating arm, and provided with adjustable shoulders or nuts
 110 on opposite sides of said arm J^2 , substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

WILLIAM R. RONEY.

Witnesses:

C. CLARENCE POOLE,
 HARRY COBB KENNEDY.