

(No Model.)

2 Sheets—Sheet 1.

W. S. WALKER.
FURNACE FUEL FEEDING APPARATUS.

No. 441,725.

Patented Dec. 2, 1890.

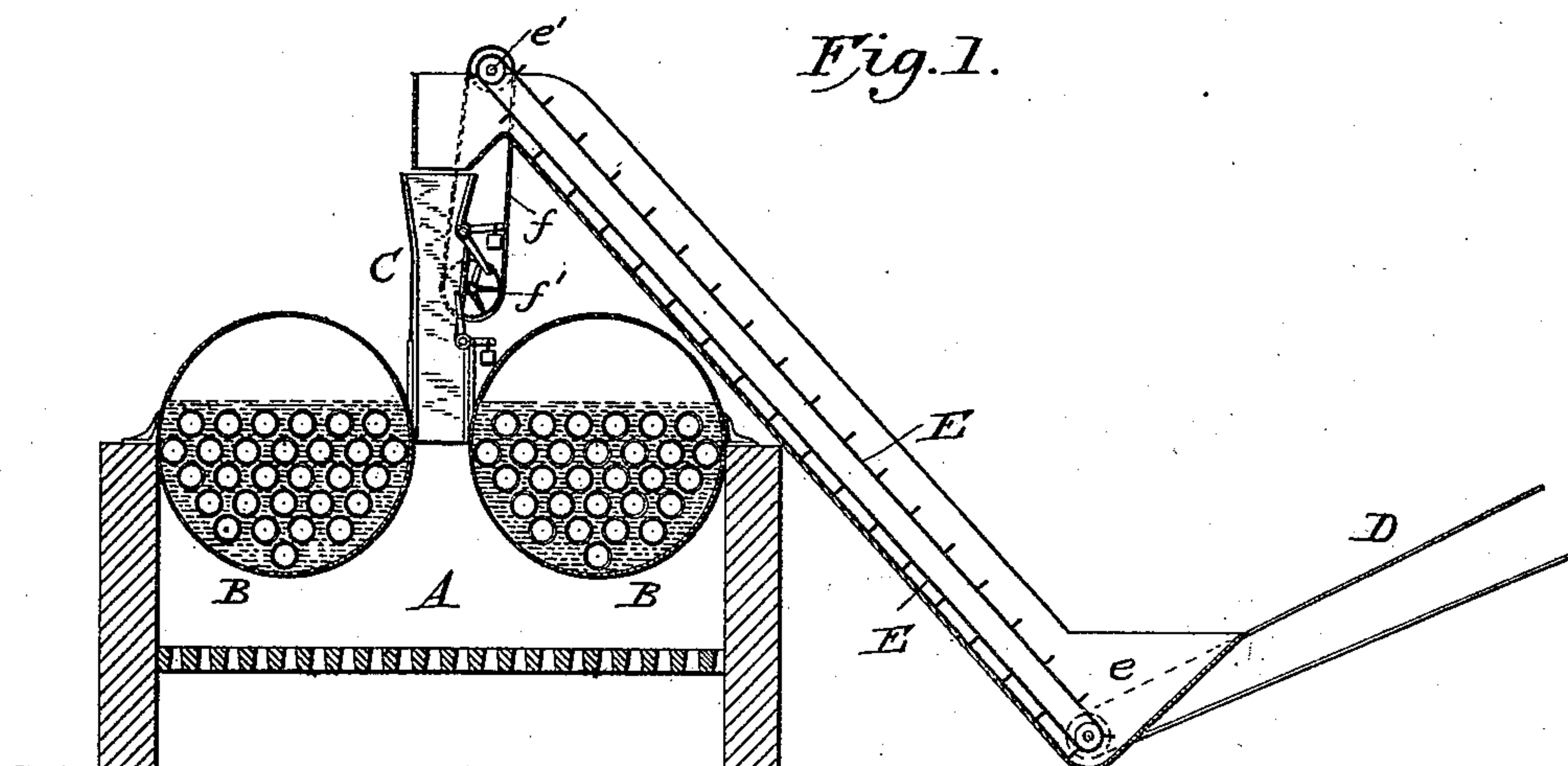


Fig. 2.

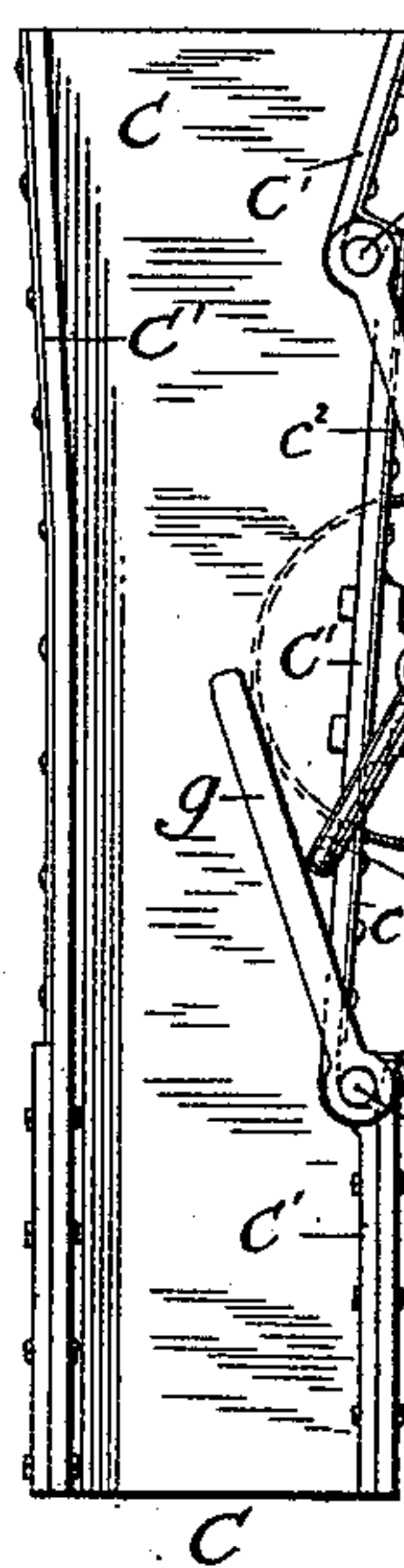


Fig. 3.

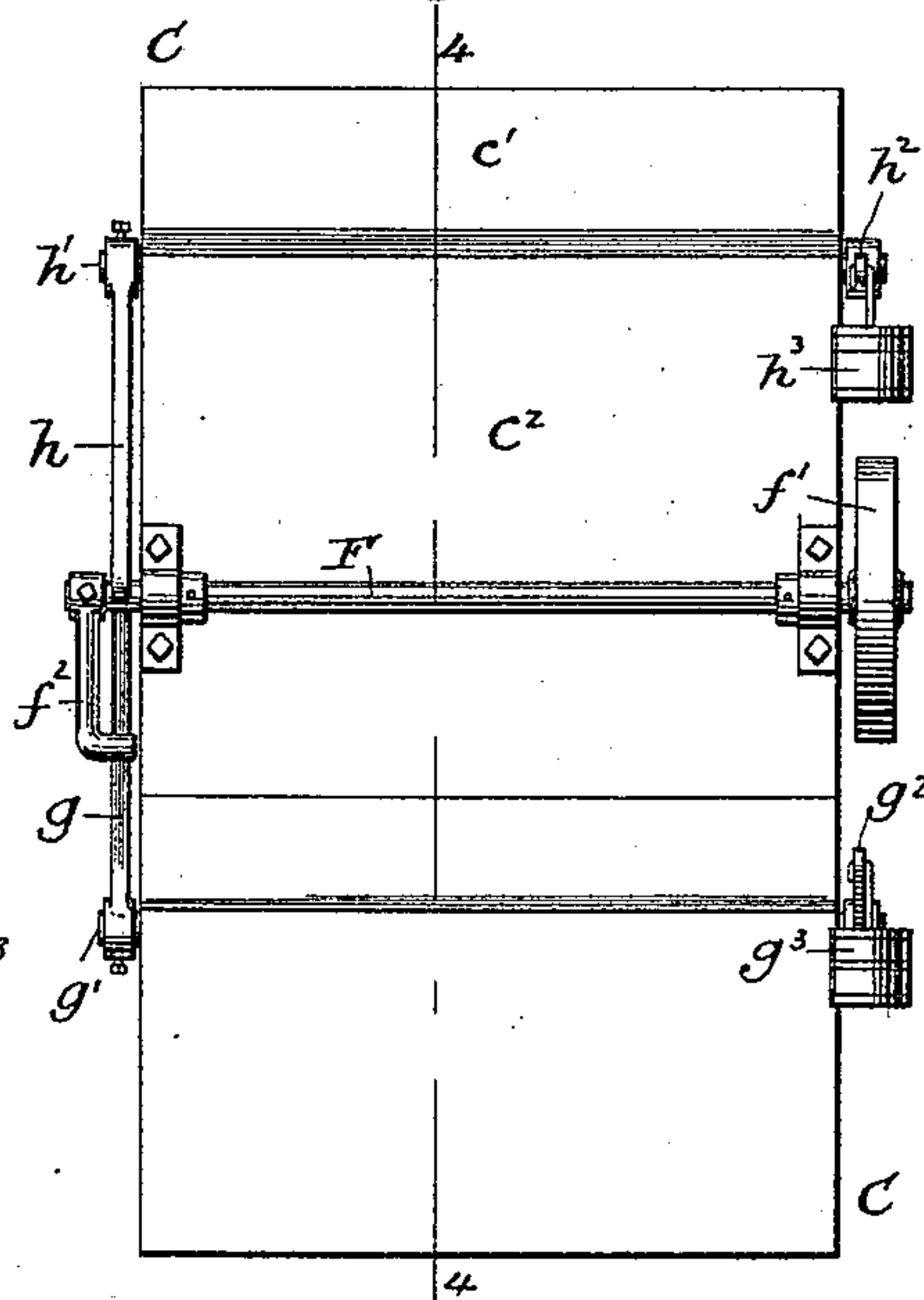


Fig. 4.

ON LINE. 4-4

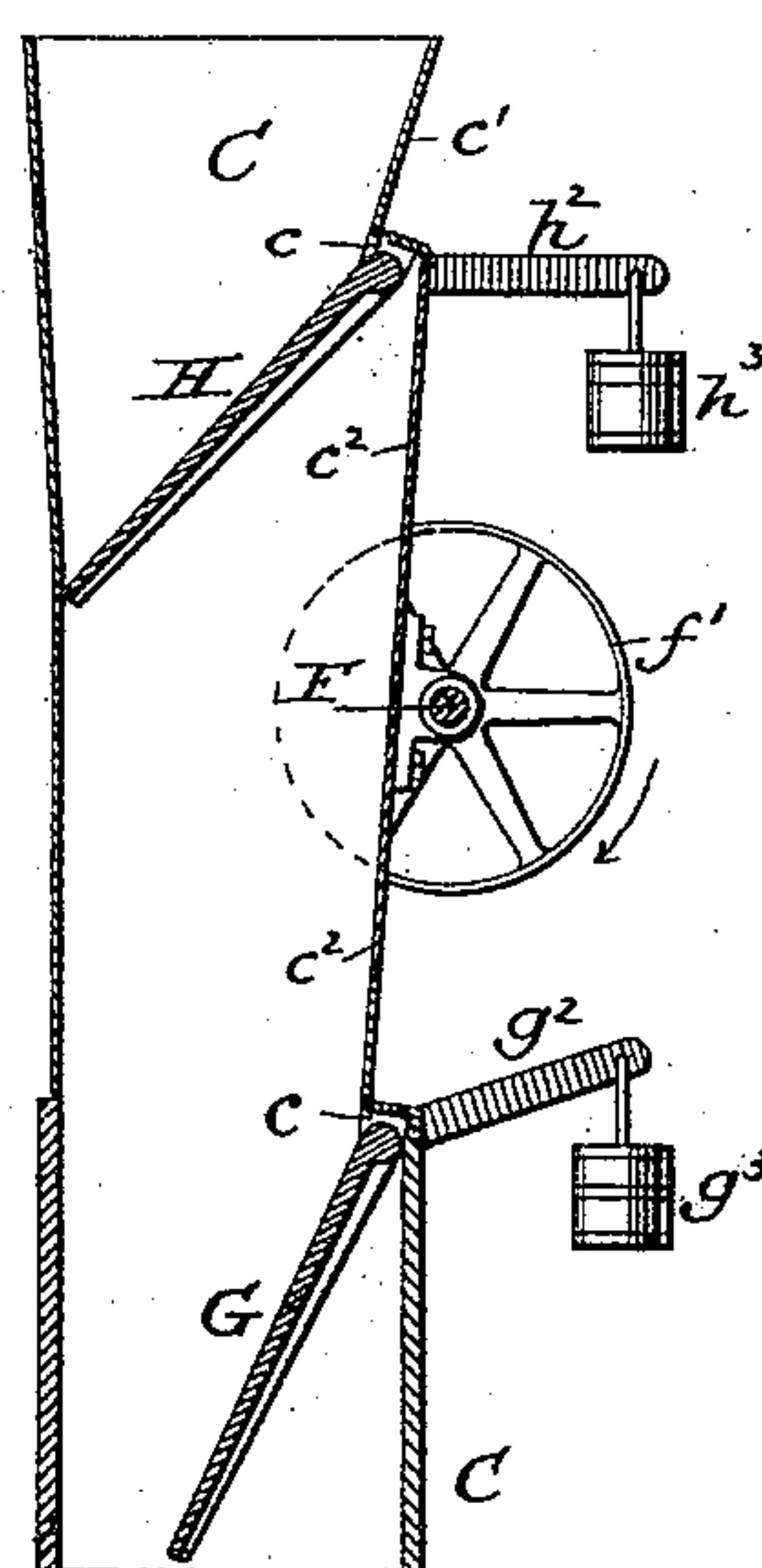
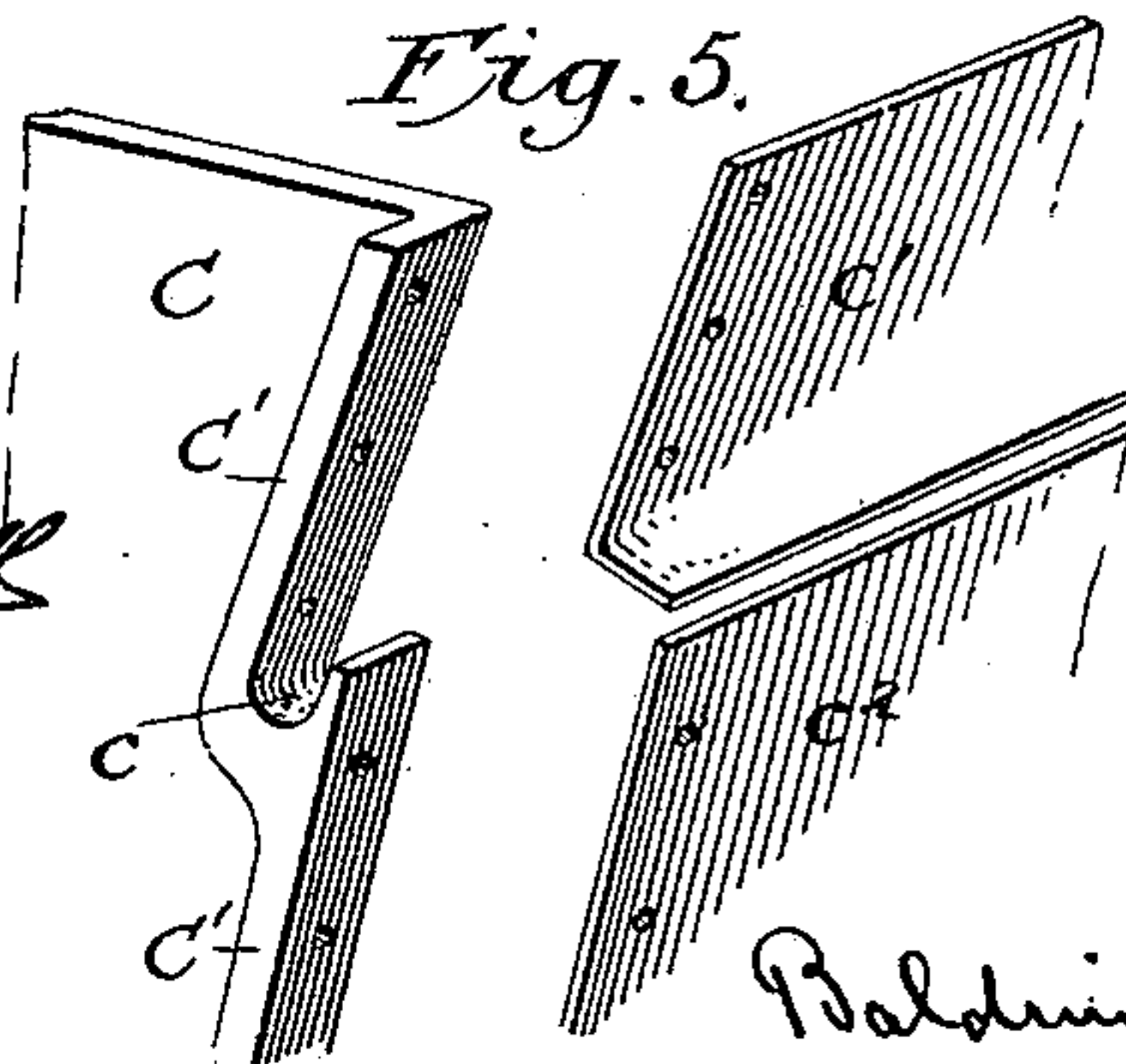


Fig. 5.



Attest:
Siding P. Hurlingworth
Baltus D. Long.

Inventor:
Warren S. Walker
by his attorneys
Baldwin Davidson & Wright.

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Fig. 6

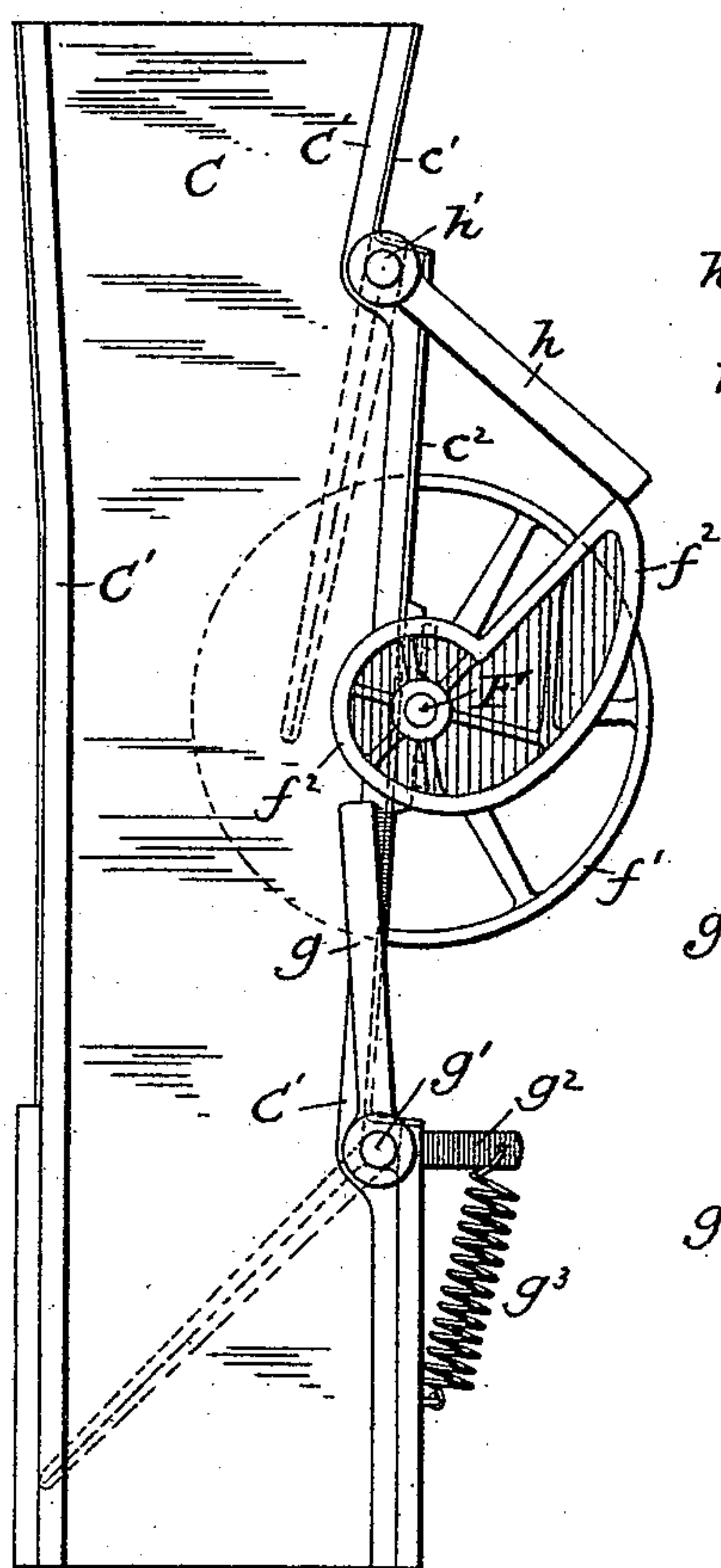
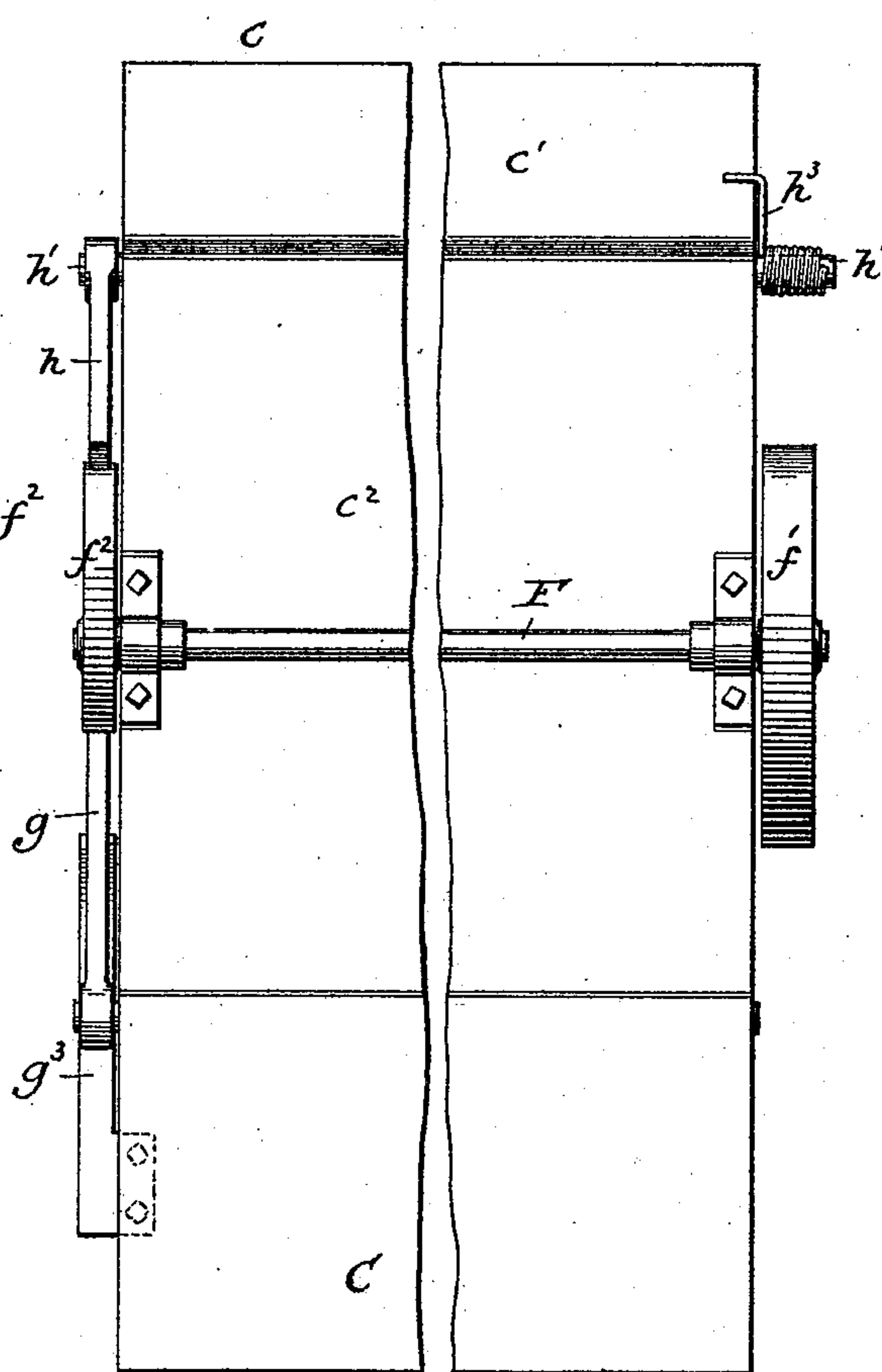


Fig. 7.



Attest

Sidney P. Hollingsworth

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Inventor

Warren S. Walker
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Baldwin Wadsworth & Wright

UNITED STATES PATENT OFFICE.

WARREN STONE WALKER, OF MANCHAC, LOUISIANA.

FURNACE FUEL-FEEDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 441,725, dated December 2, 1890.

Application filed June 9, 1890. Serial No. 354,771. (No model.)

To all whom it may concern:

Be it known that I, WARREN STONE WALKER, a citizen of the United States, residing at Manchac, in the parish of East Baton Rouge and State of Louisiana, have invented certain new and useful Improvements in Furnace Fuel-Feeding Apparatus, of which the following is a specification.

My invention relates to furnaces of that class in which the fuel has been fed in mechanically. Where this is done through a single door or valve, sparks are liable to escape through the opened valve, which is dangerous where certain classes of fuel—such as bagasse, shavings, or sawdust—are employed. This difficulty has in some cases been obviated by feeding the fuel through passages closed by valves successively operated, so that one is closed before the other opens, and it is to this latter class of apparatus that my improvements more especially relate.

One principal object of my invention is to feed the fuel to the furnace automatically and positively in regulated quantities, which end I attain, and the first part of my invention consists, in combining a carrier, a hopper, a series of valves therein, and mechanism which opens and closes the valves successively, so that the feed-passage is always closed to prevent the escape of sparks, while leaving the fuel-supply unobstructed.

My improvements further consist in certain details of construction of the apparatus hereinafter specified.

The accompanying drawings show so much of apparatus embodying my improvements in the best way now known to me as is necessary to illustrate the subject-matter claimed.

Unless otherwise specified the parts are of usual well-known construction.

Figure 1 represents a vertical transverse section through a steam-boiler furnace with my safety feed-hopper applied thereto and a vertical longitudinal section through the feed apron or carrier; Fig. 2, an end elevation of the hopper; Fig. 3, a side view thereof; Fig. 4, a vertical transverse section therethrough on the line 4 4 of Fig. 3, and Fig. 5 detached perspective detail views showing the construction of the hopper-casing. Figs. 6 and 7 respectively represent end and side elevations

of a modification of the apparatus for actuating the hopper gates or doors.

A furnace A is shown as provided with boilers B, between which lies the hopper C. A belt or band D, from any suitable prime mover, drives an apron or carrier-belt E, the lower end of which works in a box e, while the other end terminates over the hopper C. A band, belt, or chain f, encircling a pulley on the carrier-shaft e', drives a pulley f' on a shaft F, mounted in suitable bearings on the hopper-case and carrying a crank-arm or wiper f² on its opposite end. This crank-arm revolves in the direction shown by the arrows between levers or rocking arms g h, mounted on rock-shafts g' h', rocking in suitable bearings in the hopper-case. Doors, gates, or valves G H, mounted on these rock-shafts, respectively vibrate across the hopper, preferably resting when closed at an angle of about forty-five degrees to the perpendicular. These valves are normally held closed by rocking arms g² h², provided with counterbalancing-weights g³ h³. The sides of the hopper-case C are preferably made of metal, with flanged ends C', provided with shoulders or open bearings c for the rock-shafts g' h', which carry the valves. The ends of the hopper are closed by plates c' c², the former being flanged at bottom so as to rest on the shoulders and serve to hold the rock-shafts in place, and thus secure a strong, simple, and effective organization of parts, which can readily be assembled or detached.

Figs. 6 and 7 show a modified form of the apparatus, in which the crank-arm is replaced by an eccentric, and the doors are counterbalanced by springs instead of weights, which give a quicker and more sudden action to the parts, as will be readily understood.

The operation of the apparatus will readily be comprehended from the foregoing description. Fuel—such as bagasse, sawdust, shavings, coal, &c.—thrown into the box e is delivered by the carrier into the hopper, both gates G H of which are normally closed. The crank-arm or eccentric in its revolution opens first one gate and then the other to allow the fuel resting thereupon to descend, the weight or spring closing one gate before the other is open. In this way the fuel is automatically,

positively, and intermittently, but regularly, fed into the furnace. The rate of the feed, as well as its amount, can be regulated in various well-known ways—such, for instance, as
5 varying the rapidity of traverse of the carrier-apron or the frequency of the rotation of the crank-arm or crank-shaft—while the counterbalancing can be regulated by varying the weights or the tension of the springs.
10 I do not broadly claim feeding fuels successively through a series of gates to a hopper, as that is old.

Having thus fully described the construction, organization, and operation of my improved furnace fuel-feeding apparatus, what
15 I claim therein as new and as of my own invention is—

1. The combination, substantially as here-
inbefore set forth, of a hopper, a series of feed
20 doors, gates, or valves arranged therein one above the other, shafts or pivots around which they turn independently, counterbalancing mechanism which normally holds them closed, and a tripping device interposed between the
25 gates and acting positively on both of them, alternately opening them independently.

2. The combination, substantially as here-
inbefore set forth, of a hopper, counterpoised gates or valves turning on axes therein, arms
30 mounted on said axes, and a rotating trip-arm interposed between the gate-arms and acting

alternately directly upon the arms to open the gates successively.

3. The combination, substantially as here-
inbefore set forth, of a hopper, a series of
35 counterpoised gates therein, a feed apron or carrier delivering the fuel into the hopper, a shaft actuated from this carrier, and a trip-arm mounted on said shaft and acting successively on the gates to open them independ-
40 ently, said counterpoised gates being arranged to close themselves automatically.

4. The combination, substantially as here-
inbefore set forth, of a hopper, gates therein, rock-shafts on which said gates are mounted,
45 springs normally holding the gates closed, crank-arms on the rock-shafts, and an interposed eccentric acting directly and successively upon the crank-arms and releasing them suddenly to allow them to close quickly.
50

5. The combination, substantially as here-
inbefore set forth, of the flanged ends of the hopper-case, the shoulders therein forming bearings for the hopper-gates, and the flanged casing-plates covering said bearings.
55

In testimony whereof I have hereunto subscribed my name.

WARREN STONE WALKER.

Witnesses:

L. D. BEALE,
ALEXANDER JOURDAN.