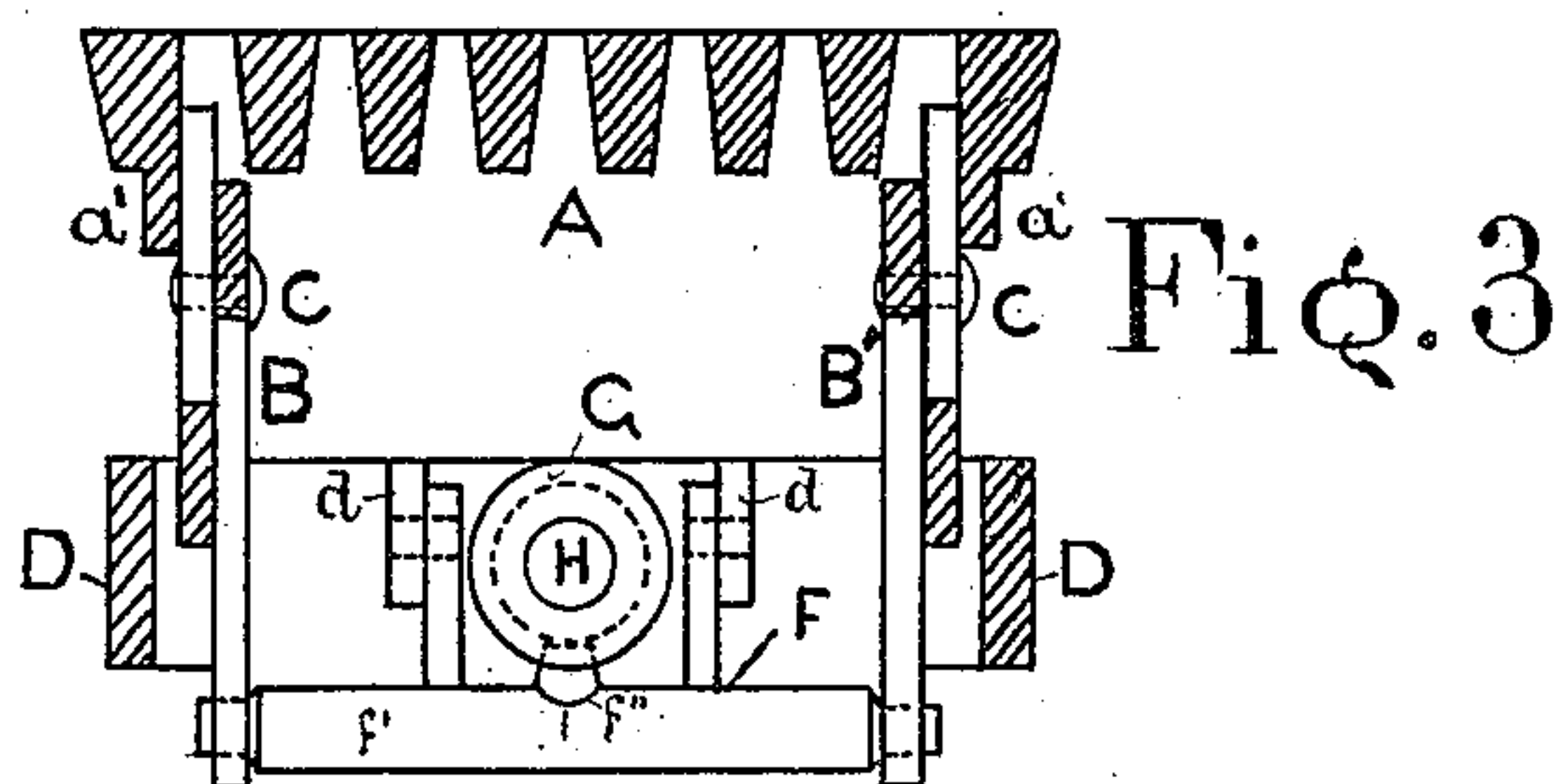
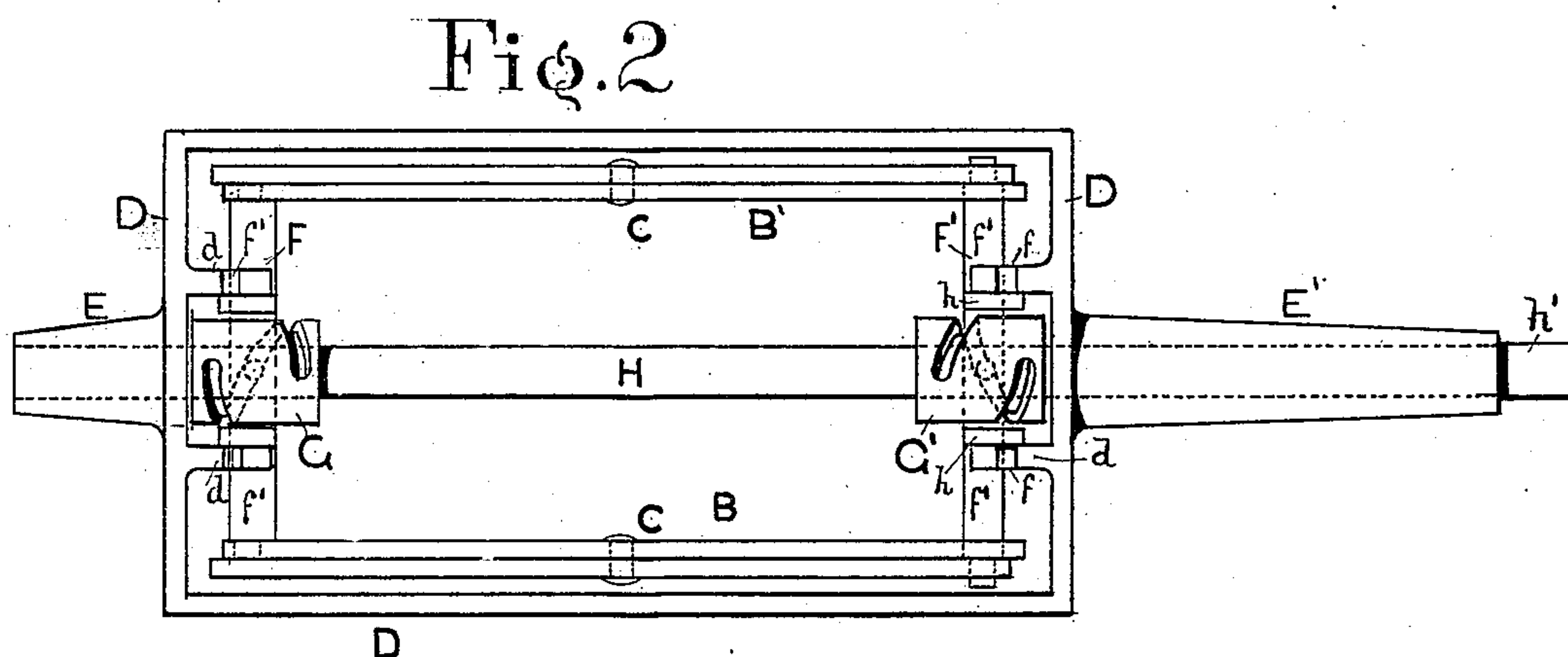
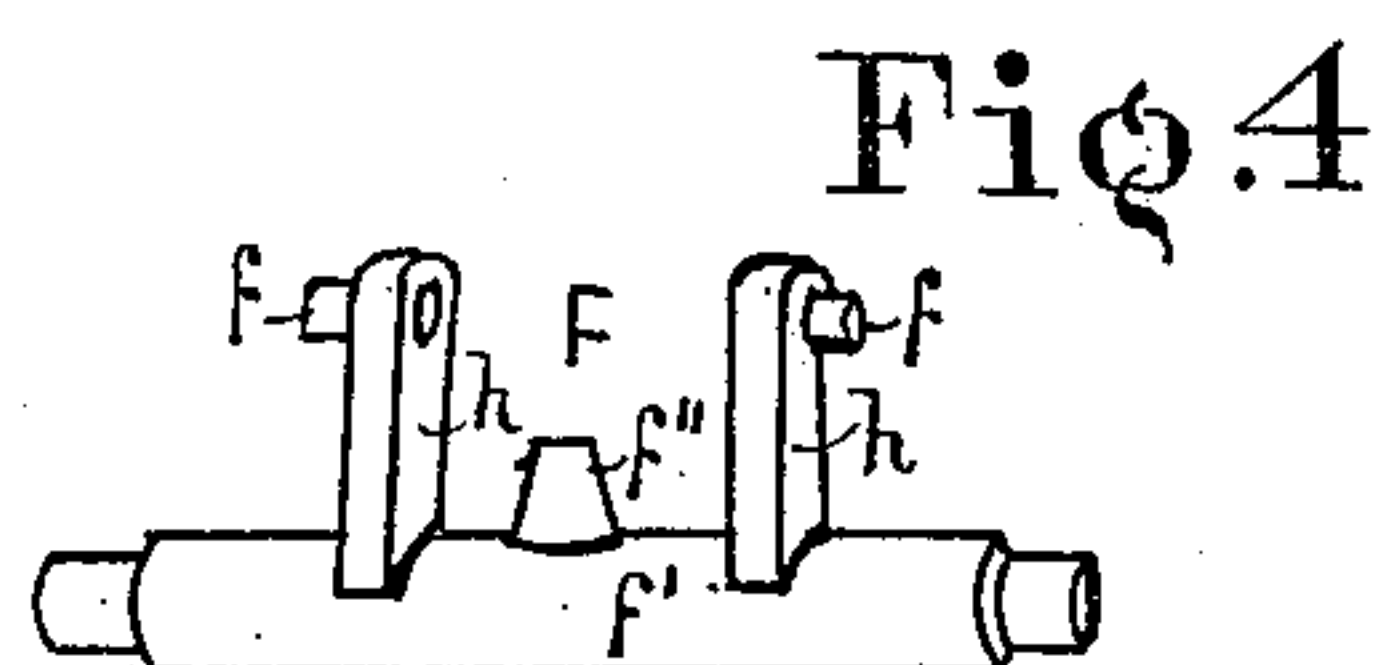
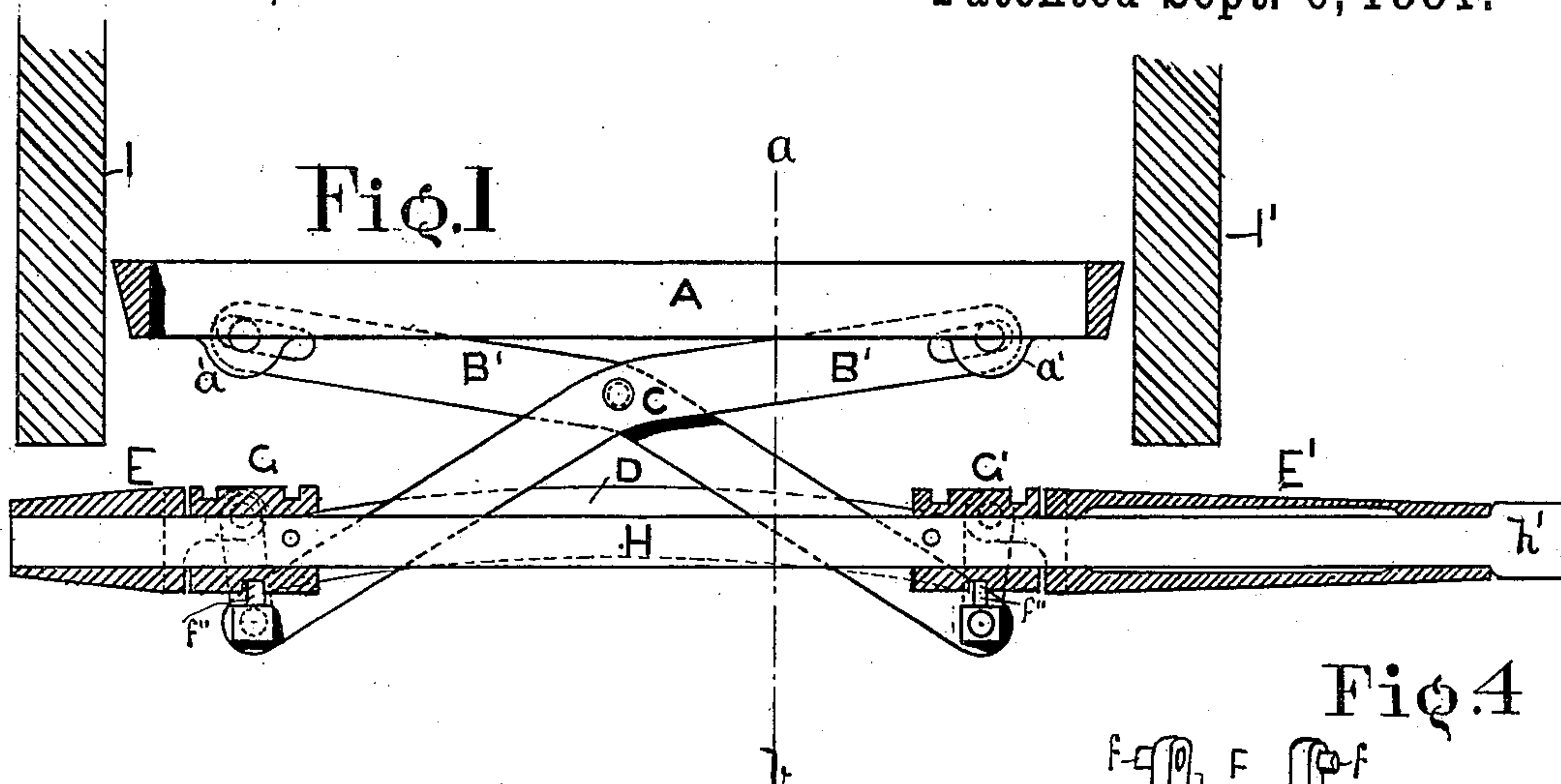


(No Model.)

T. KEARNS.  
GRATE FOR STOVES AND FURNACES.

No. 246,786.

Patented Sept. 6, 1881.



WITNESSES

A. B. Bowers,  
James L. Drum

INVENTOR

Thomas Kearns  
by George Pardee  
Atty.



# UNITED STATES PATENT OFFICE.

THOMAS KEARNS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO WILLIAM E. CALDWELL, OF SAME PLACE.

## GRATE FOR STOVES AND FURNACES.

SPECIFICATION forming part of Letters Patent No. 246,786, dated September 6, 1881.

Application filed July 5, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS KEARNS, a resident of San Francisco, State of California, have invented a new and useful Improvement in  
5 Grates for Stoves and Ranges, of which the following is a specification.

My invention relates to the application of a device underneath the ordinary grate of stove and range furnaces, by which the said grates  
10 may be raised or lowered to adjust the vertical depth of the furnace within certain limits without disturbing the fuel which may be resting upon the grate.

The object of this improvement is to contract  
15 the furnace, and thus economize fuel when the requirements of service will permit, and to increase the facilities and conveniences of the furnace by raising and lowering the fire-bed to accommodate the varying occasions of its use.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my device applied to a grate, which is shown between the walls of a furnace. Fig. 2 is a plan of my device with the grate removed. Fig. 3 is a cross-  
20 sectional elevation taken through line *a b* in Fig. 1. Fig. 4 is a detail of the hanger.

In the different figures the same letters refer to the same parts.

A is the grate, unchanged from ordinary  
30 grates, except by the addition of the lugs *a'*, which are provided for attaching the ends of the lifting-frame thereto.

B B' are a couple of sections of what is technically called a "Jacob's ladder," each section  
35 being formed of two flat bars, placed side by side and pivoted together at about the middle at C. When the lower end of each bar is secured from vertical motion, and either or both these ends are moved horizontally, the effect  
40 will be to elevate or depress the upper ends accordingly as the lower ends are drawn together or spread apart, and if anything be rested upon or attached to the upper ends it will, of course, be raised or lowered with them. This device  
45 is placed underneath the grate, where it is comparatively cool, and the grate rests upon it or is attached in any suitable manner.

D is a frame, which is placed parallel to the grate in that part of the furnace just below  
50 the fire-tiles and above the ash-pan. The

stems E E' correspond with the solid stems heretofore cast on the grate A, and they serve as an axis to turn the grate upon when dumping the ashes, and they rest in the same holes or bearings already found in stoves or ranges. 55 Inside this frame D are lugs *d*, projecting inward, from which are suspended the swinging levers or hangers F F', each hanger having a pivot, *f*, resting in notches on the lugs *d* or passing through them, as preferred. These 60 hangers are shaped as shown in Fig. 4, and consist in a horizontal rod, *f'*, set crosswise of the grate and reaching between and passing through the lower ends of the opposing sections of the Jacob's ladder. Standing ver- 65 tically at the proper position are the hanging levers *h*, which attach by pivots *f* to the lugs *d*.

At the middle of the horizontal rod is a little vertical spur, *f''*, which projects into the spiral groove formed on the periphery of the 70 collar or rotary cams G G'. These collars or rotary cams are made with right and left handed grooves, and are firmly secured at proper positions on the rod H, which rod passes through the stems or bearings E E', cast on 75 the frame D, and terminates at a point sufficiently far forward to make it convenient to apply a key or wrench upon it, the end at *h'* being made square to receive the same. Where the upper ends of the Jacob's ladder connect 80 with the grate a pin passes through the lugs on the grate and the slotted hole in the levers, as shown in Fig. 1.

I I' are the fire tiles or walls of the furnace.

The operation is simple and as follows: My 85 device being inserted in the furnace-box of a stove or range, a key-wrench is applied on the square end of the rod H, by turning which the spiral cams secured thereon are made to turn, and acting on the vertical spurs *f''* draw 90 together or spread apart, as may be, the horizontal bars *f'* of the hangers F F'. By means of this action the Jacob's ladder secured thereto is opened or closed, and the grate is elevated or depressed correspondingly. 70

The grate should be made with beveled edges all around, as in Figs. 1 and 3, so that the cinders or clinkers may be prevented from wedging in between the walls of the furnace and the grate to prevent the grates moving. 100

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. In a furnace of a stove or range, the combination, with the grate A, of the raising and  
5 lowering device herein described, consisting of the crossed bars B B', hangers F, spiral cams G G', and rod H, supported in the frame D, as and for the purpose substantially as described.

2. The combination of the crossed bars B B'  
10 with the grate of a furnace, substantially in the manner described, so that as they are moved between horizontal and vertical positions the grate resting thereupon will be correspondingly elevated or depressed.

3. The combination of the rod H and hollow 15 stems E E', through which it passes, transmitting motion therethrough to any suitable raising or lowering device operating upon the grate A, the said stems E E' being also used as an axis upon which the grate is turned in the 20 act of dumping the ashes.

THOMAS KEARNS.

Witnesses:

GEORGE PARDY,  
JOHN RAFFERTY.