

(Model.)

3 Sheets—Sheet 1.

J. CONNOR & O. A. WADSWORTH.
Fire Grate.

No. 234,907.

Patented Nov. 30, 1880.

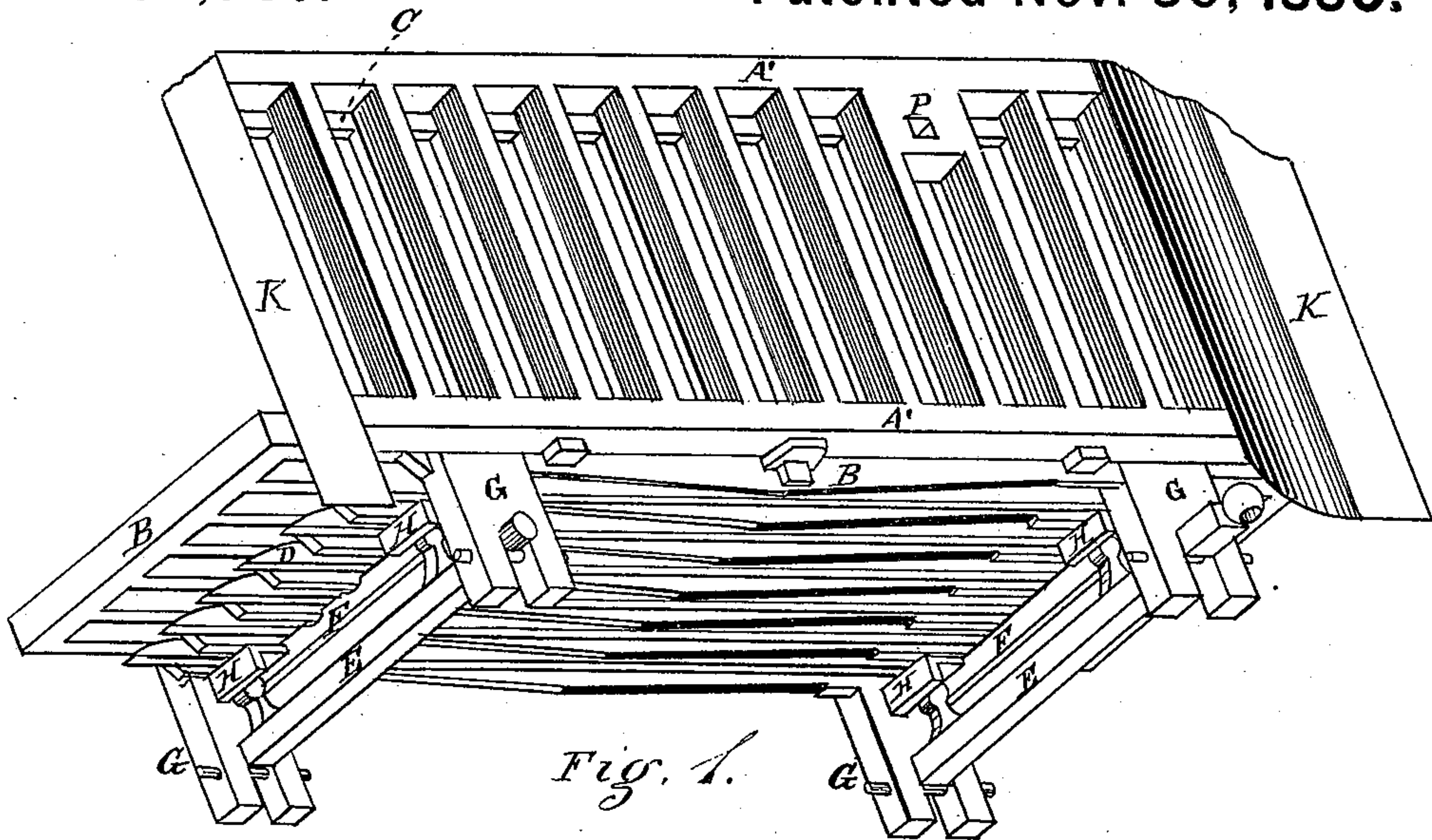


Fig. 1.

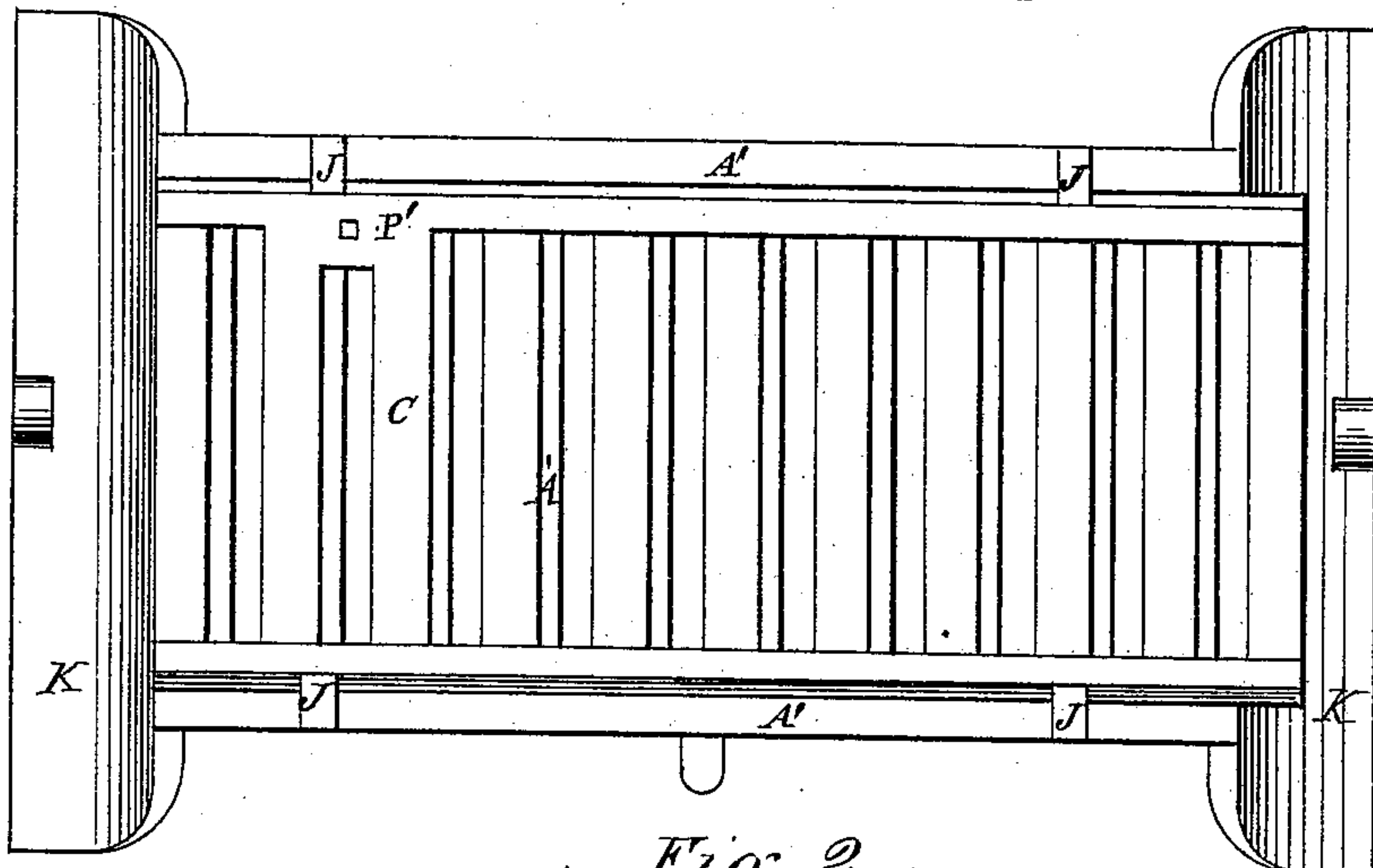


Fig. 2.

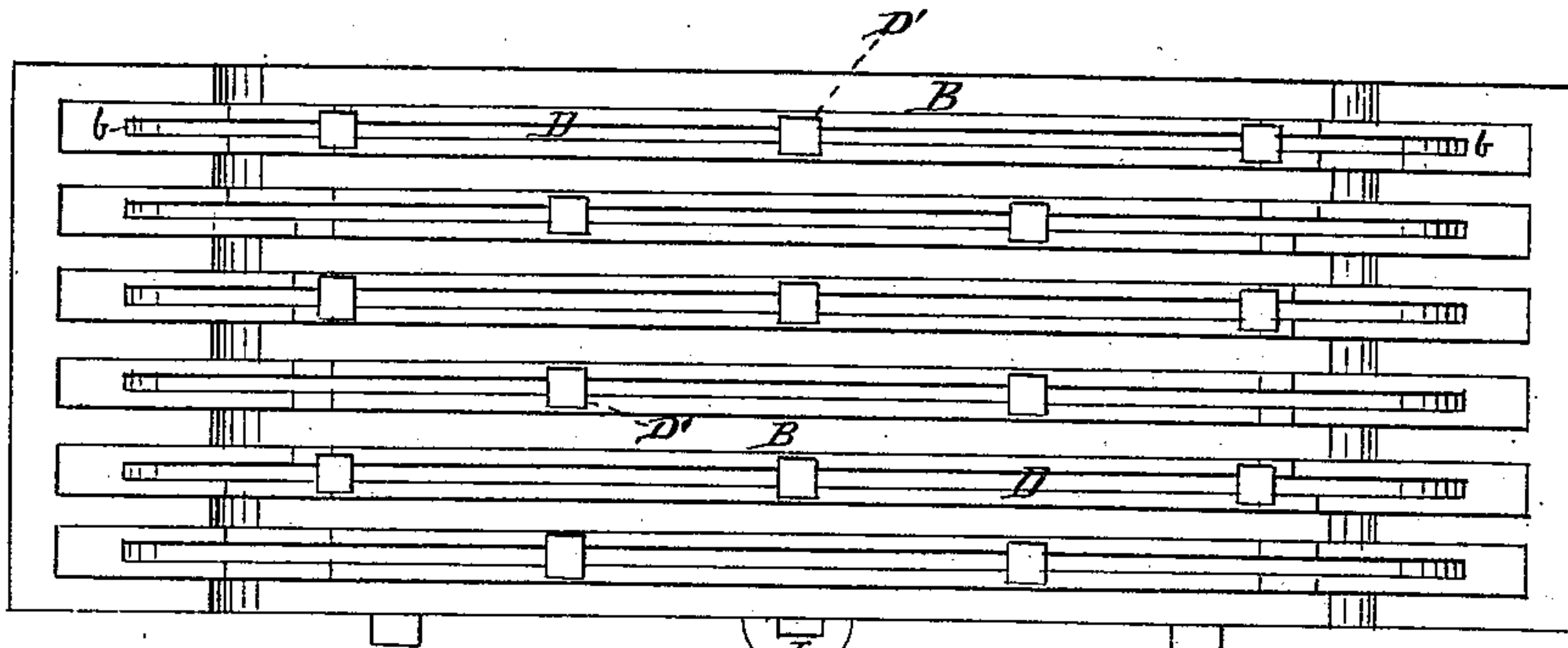


Fig. 3.

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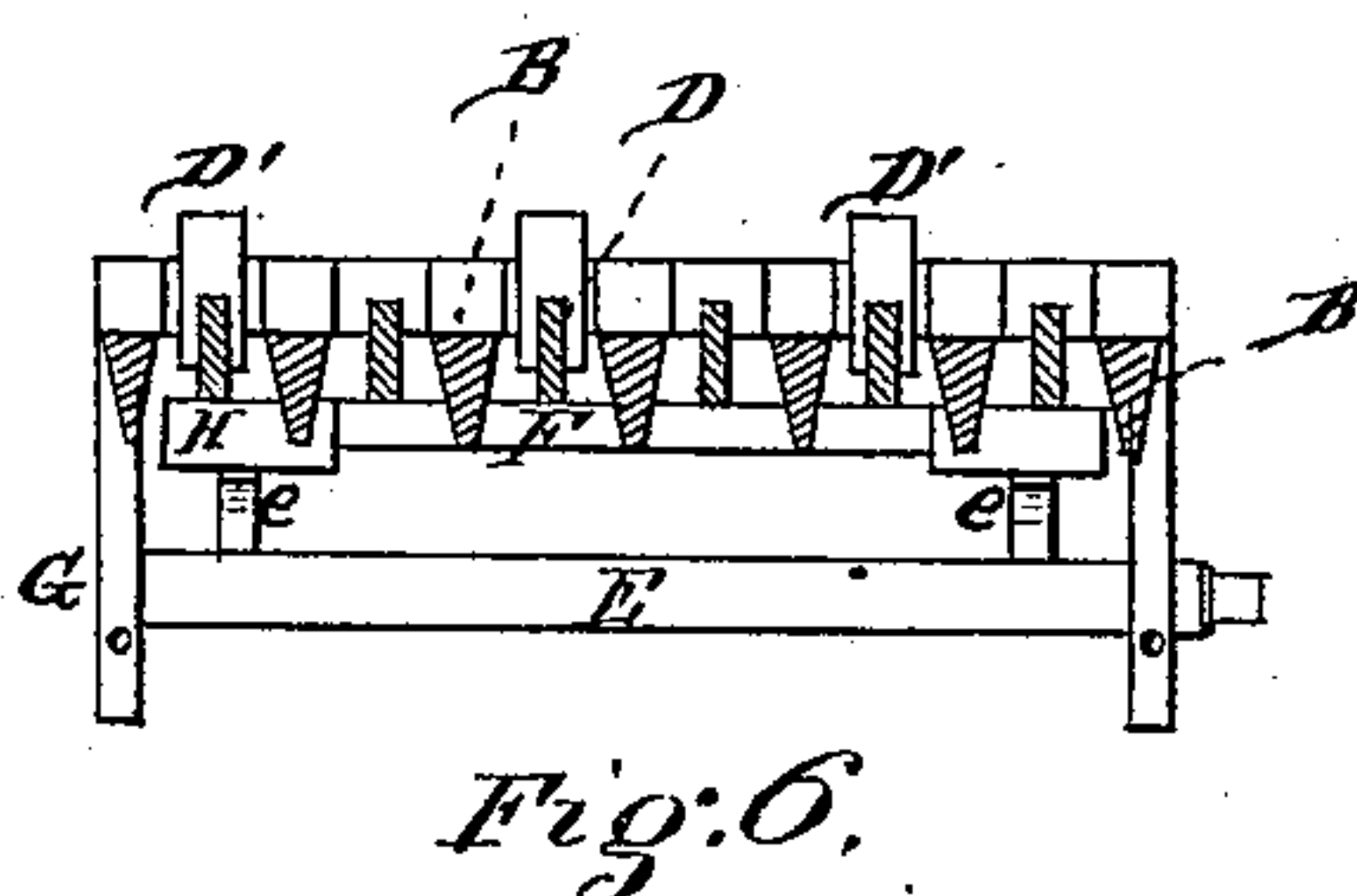
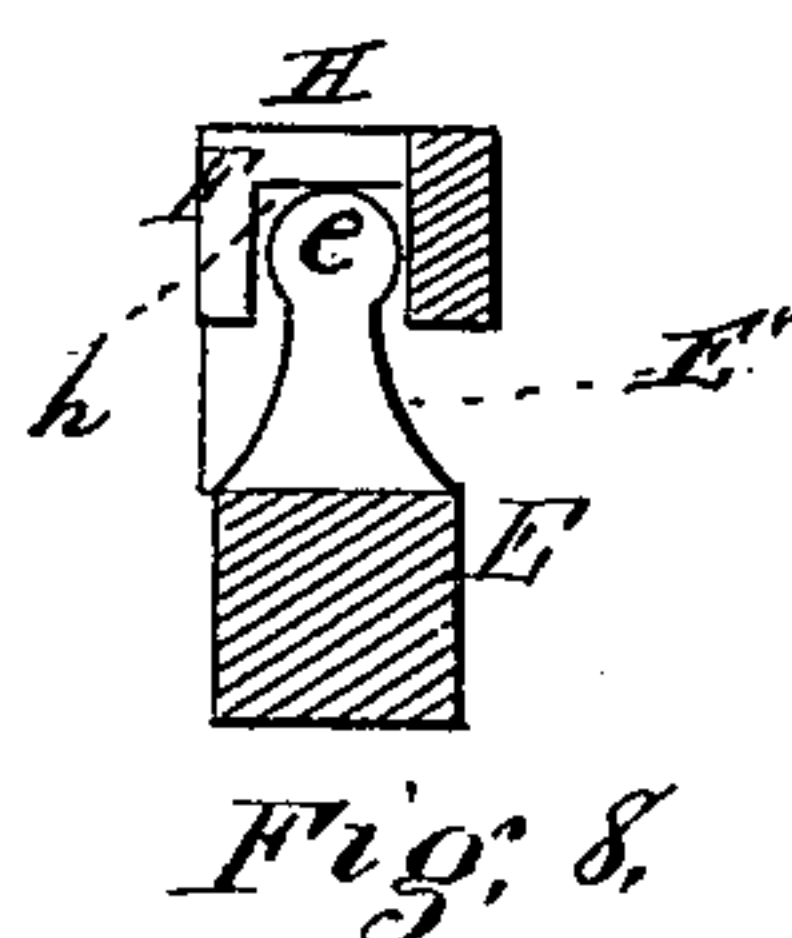
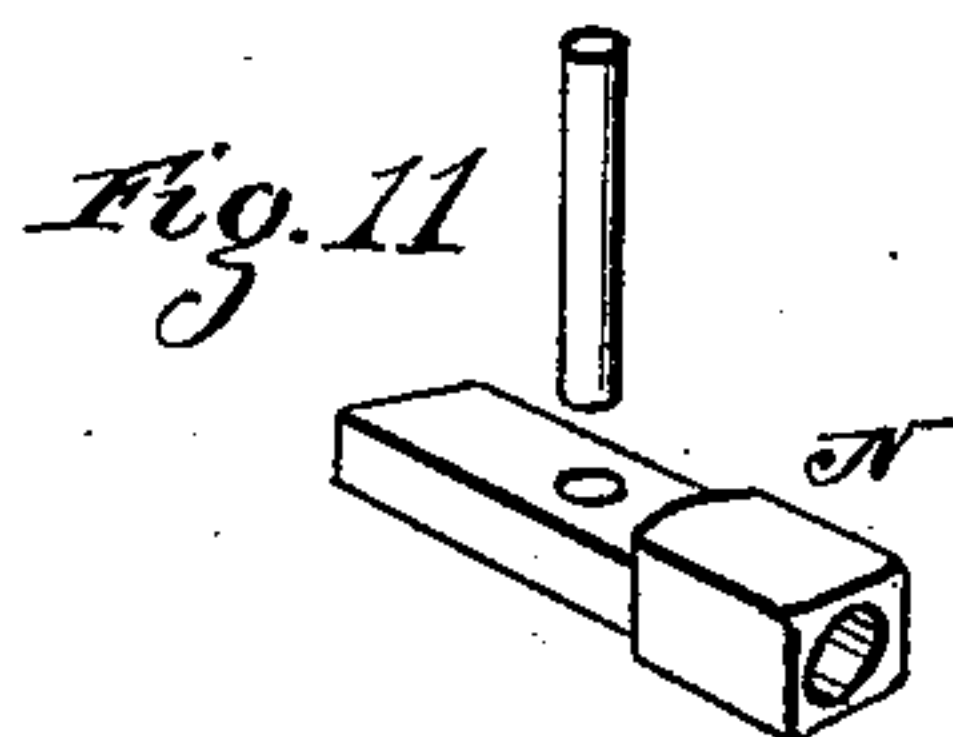
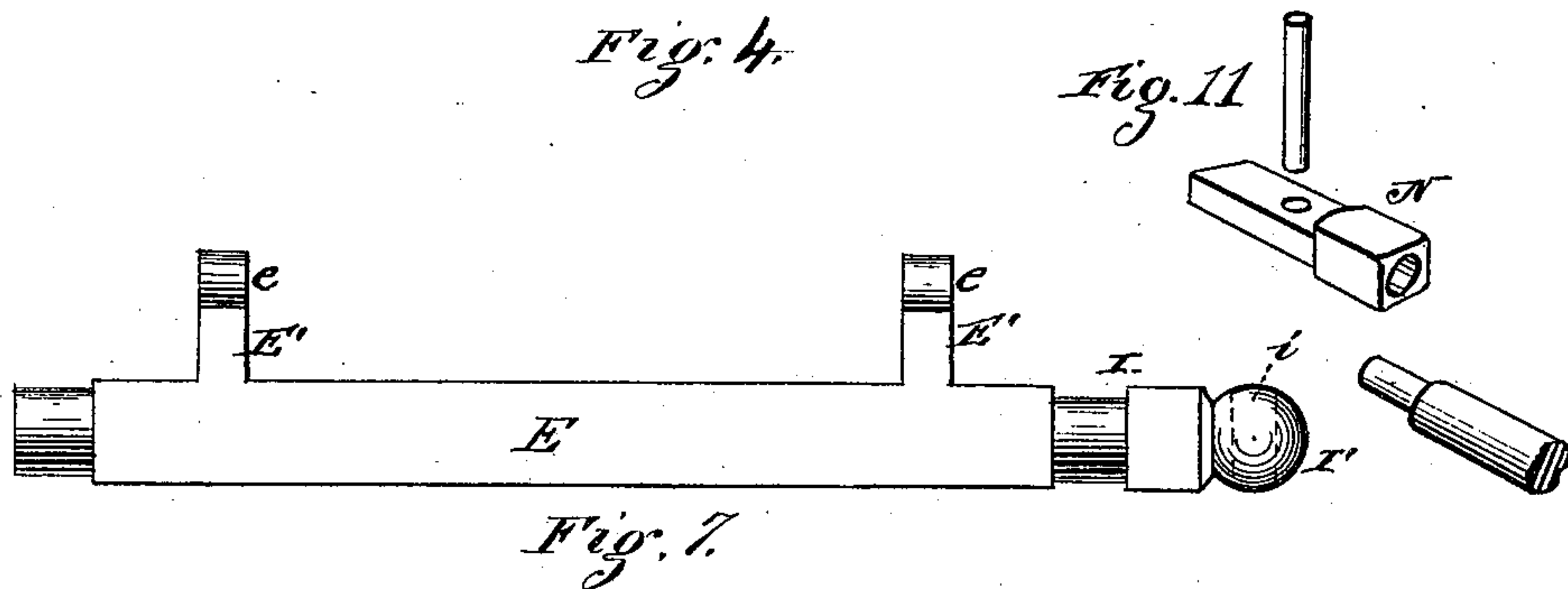
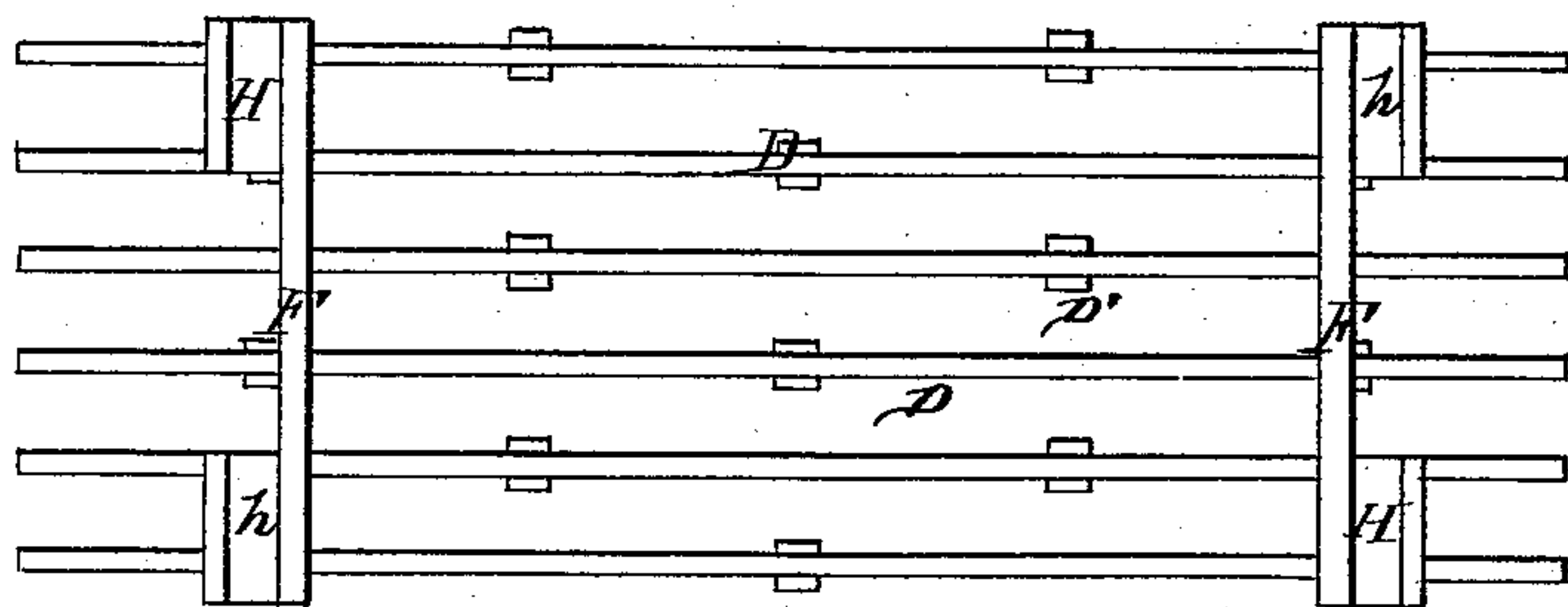
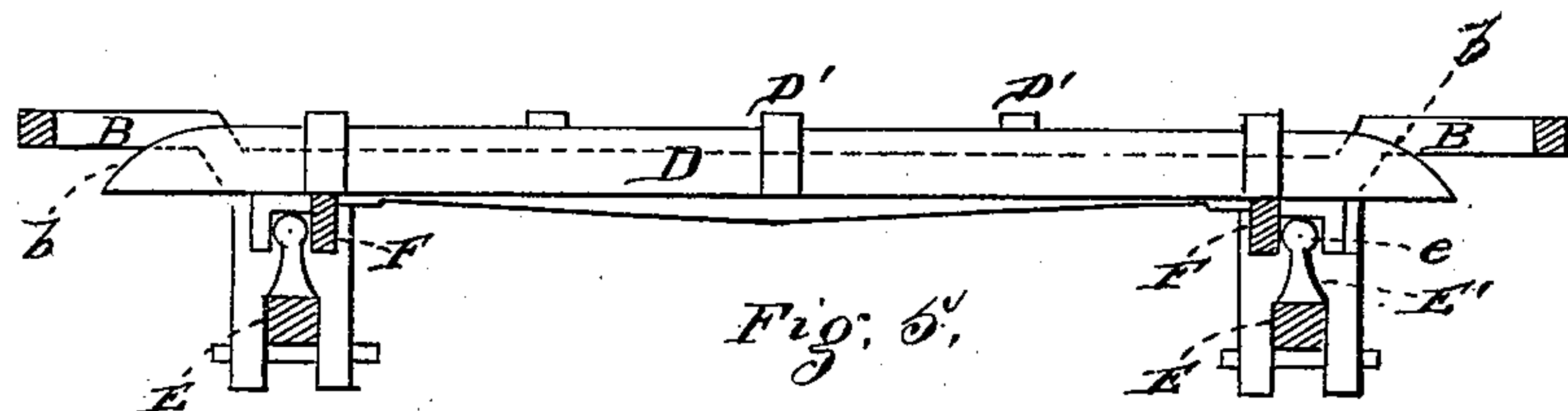
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(Model.) J. CONNOR & O. A. WADSWORTH. ³ Sheets—Sheet 3.
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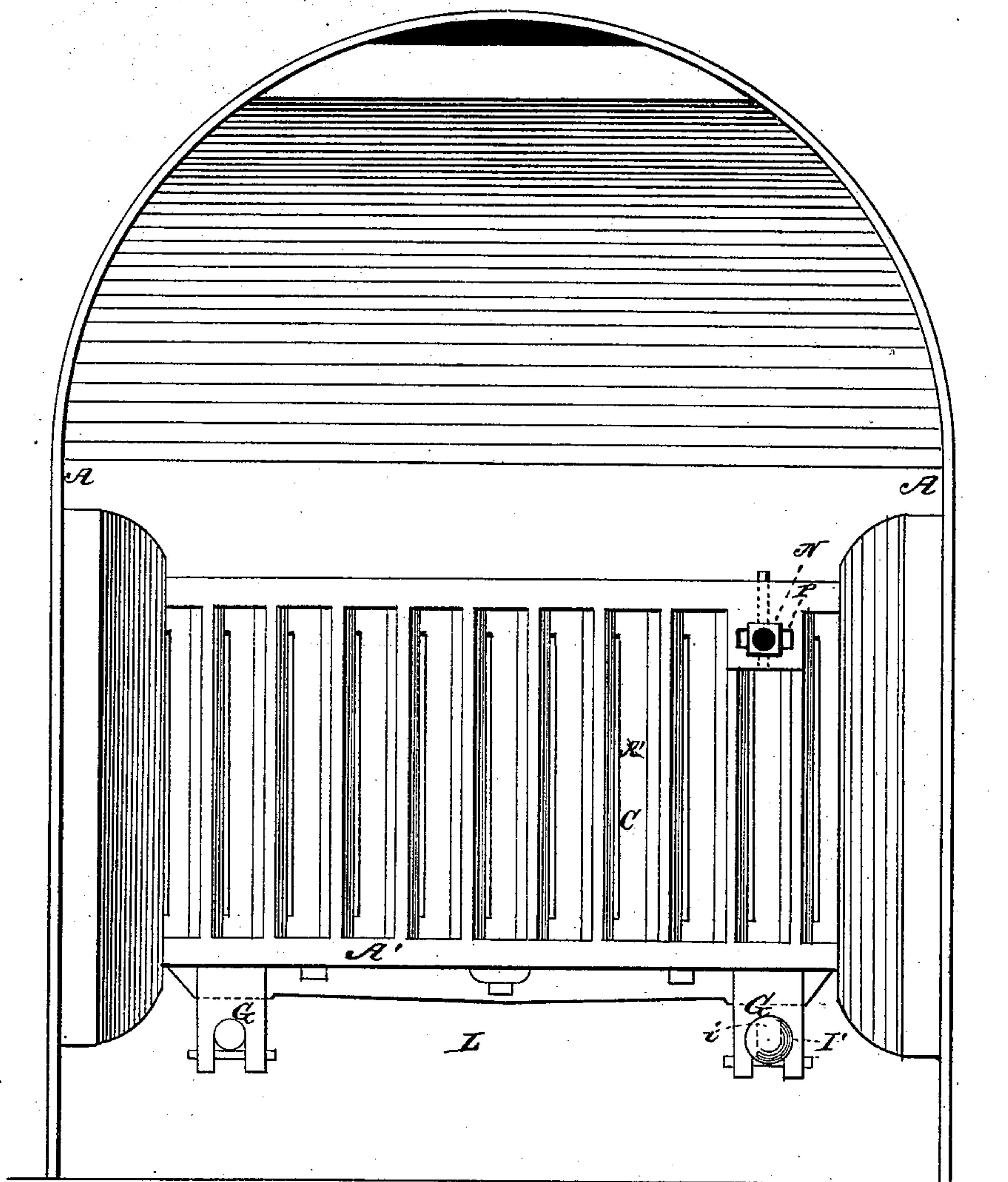


Fig. 9.

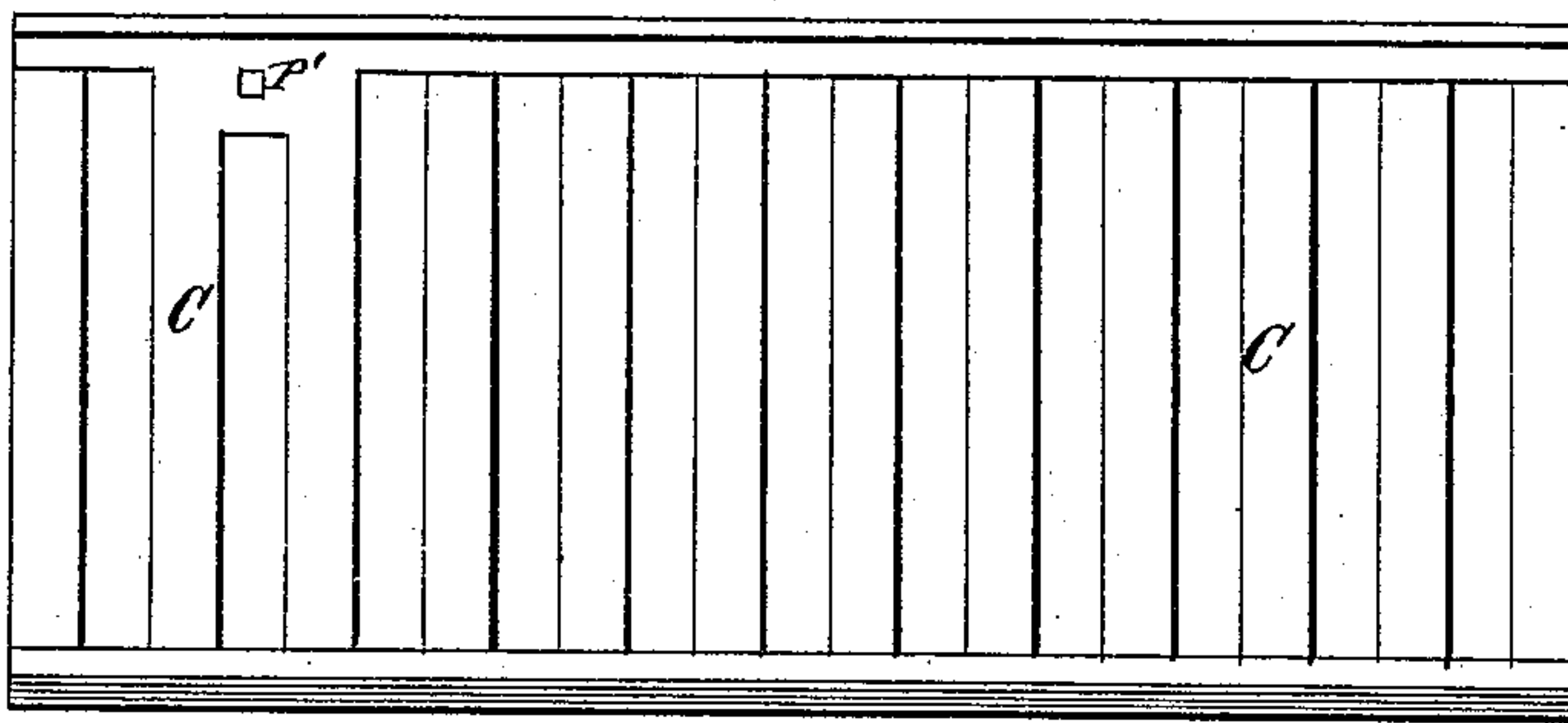


Fig. 10.

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UNITED STATES PATENT OFFICE.

JOHN CONNOR AND OMAR A. WADSWORTH, OF ALLEGHENY, PENNSYLVANIA,
ASSIGNORS TO JAMES L. ORR, OF SAME PLACE.

FIRE-GRATE.

SPECIFICATION forming part of Letters Patent No. 234,907, dated November 30, 1880.

Application filed August 14, 1880. (Model.)

To all whom it may concern:

Be it known that we, JOHN CONNOR and OMAR A. WADSWORTH, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fire-Grates to be Used in Fire-Places, Stoves, Ranges, and Furnaces; and we do hereby declare the following to be a full, clear, and exact description thereof.

The objects of this invention are chiefly to provide a fire-grate with sets of bars which will effect the rapid and thorough shaking down of the ashes without letting the cinders fall through, and to conveniently regulate the draft across the whole front of the fire-place or stove, so that the same may be partly or wholly closed without cutting off the draft below the grate.

To carry out said objects, our invention consists, first, in the combination, with a fixed set of grate-bars, of a second set working up through the same and having a compound end-wise and up-and-down motion; secondly, in the combination, with a fixed set of grate-bars and a second set having such compound motion, of a pair of rocking shafts and means for operating them, whereby the said motion can be caused from the outside of the fire-place or stove; thirdly, in the combination of a fixed set of grate-bars with a movable set of grate-bars having blocks extending upward from them to operate on the ashes and cinders above the said bars; fourthly, in the combination of a stove front or fire-place front having an open space at the bottom with a draft-regulating slide, which extends across the front of the said front above the grate-bars; fifthly, in the combination, with a fixed open or slotted frame and guides attached thereto, of a similar end-wise-movable frame, adapted to partly or wholly close the draft above the grate-bars without affecting the draft below the same; sixthly, in combination with the said fixed frame and sliding frame, an arm or bar pivotally secured to said inner sliding frame, extending through a slot in said outer frame and socketed at its outer end to receive a device whereby it is vibrated; and, finally, in the special construction and combination of the

various parts of the grate-bars, draft-regulating devices, and register-frames, substantially as hereinafter set forth.

In the accompanying drawings, Figure 1 represents a perspective view, taken from in front and below, of our improved grate-bars and front register. Fig. 2 represents a rear elevation of the latter detached and partly closed. Fig. 3 represents a plan view of our improved grate-bars detached. Fig. 4 represents a detail bottom view of the movable set of grate-bars. Fig. 5 represents a longitudinal partly-sectional view of the grate-bars as a whole. Fig. 6 represents a transverse sectional view of the same at right angles to Fig. 5. Fig. 7 represents, in detail, on an enlarged scale, one of the rock-shafts which operate said movable set of grate-bars. Fig. 8 represents, in sectional detail, the engagement of said rock-shaft with one of the channeled bars (hereinafter described) of the movable set of grate-bars. Fig. 9 represents an elevation of the front of the fire-place, the register being open. Fig. 10 represents a front elevation of the fixed part of the register; and Fig. 11 represents, in detail, the pivoted arm which operates the register for regulating the draft.

In said figures, A designates the walls or casing of a fire-place to which my improvements are applied. The front thereof sets in on each side at K K, so as to bring the space in front of the register partly below the flue, and thus insure the drawing of dust, light ashes, and the like up into the chimney. This arrangement is not new, and therefore we do not now claim it.

The bottom of the front of the grate is left quite open across its whole width, as shown at L, and through this space there is always a draft which passes upward to the fire by way of the interstices in the grate-bars. In the said grate-front above the bars is arranged, for purposes of additional draft and the regulation thereof, a register consisting of a fixed frame, A', and a longitudinally-sliding frame, C. Said frames consist of alternating bars and open spaces, so that when the shifting of frame C causes the bars of the frames to coincide the draft is unobstructed, and when the

bars of one frame are partly or wholly opposite the spaces of the other the draft is proportionally lessened or absolutely cut off. As shown in Fig. 2, said sliding frame is held to frame A' by overlapping guides J. The said frame C is operated by a vibrating arm, N, which has horizontal motion within slots P P' in said frames. This arm is pivoted near its middle within said fixed frame, and its outer end has a socket formed in it to receive the end of a shaker or other implement suited to vibrate it. The opening of said register causes a strong draft to pass over the top of the grate-bars and fuel.

The grate-bars consist of a fixed set or frame of bars, B, and a movable set or frame of bars, D, the latter being thinner than the former and working up through the intervals between them. The said movable bars are beveled on top at both ends, as indicated at b, Figs. 3 and 5, to avoid all possibility of contact with any fixed part of the fire-place or stove.

Each one of the movable bars D is provided with several blocks, D', which project upward into the ashes and coals at the bottom of the fire. The said movable bars are connected on their under sides near their ends to cross-bars F, which terminate at each side of the frame in broad channeled bars H, as shown in Fig. 4.

The channels h of the last-named bars are of such size as to receive the rounded ends e of arms E', which extend upward from rock-shafts E, Figs. 5, 7, and 8. These rock-shafts are journaled in bearings G, which extend downward from fixed frame or set of grate-bars B; and one of said shafts, as shown in Figs. 7 and 9, has an extension, I, which protrudes into space L, and is provided with a knob, I', recessed or socketed at i to receive the end of a shaker or other implement for operating the same. When this extension is vibrated on its axis its shaft E communicates, through its arms E' and their rounded ends e, a compound upward-and-downward and end-wise-reciprocating motion to the movable bars D, causing them to thoroughly shake down the ashes and fine particles from the fuel above. In this work the blocks D' render very efficient service, as they reach up among the coals and dislodge the dead ashes which collect in the interstices thereof.

The spaces between the grate-bars are made so narrow that cinders cannot fall through. The movable set of grate-bars D is securely supported on its rock-shafts, but may be readily removed therefrom when the latter have been detached from their bearings. The grate may thus be conveniently taken to pieces to remove obstructions or repair its parts.

The front of the fire-place, stove, or furnace,

with the register attached thereto, is also preferably made detachable.

The aforesaid improvements are applicable to almost all kinds of calorific devices in which solid fuel is employed, and some of them have not even this limitation of their use.

Many of the parts described may be modified in various ways without departing from the spirit and scope of our invention.

We are aware that it is not new to employ sliding plates for regulating the draft of fire-places, stoves, &c.; also, that it is not new to combine with a fixed set of grate-bars a movable set working vertically through them and actuated by a rock-shaft or equivalent device, but without our compound or double motion.

We make no claim to such constructions as broadly stated; but

What we do claim is—

1. The combination, with a fixed set of grate-bars, of a lower set of grate-bars having compound vertical and longitudinal reciprocating motion, and devices, essentially as described, for causing such motion, substantially as set forth.

2. The combination of fixed grate-bars B and movable grate-bars D with a pair of rock-shafts journaled in bearings G of bars B, and communicating both vertical and longitudinal reciprocating motion to said bars D, substantially as set forth.

3. The combination of fixed grate-bars B with movable grate-bars D, having transverse channel-bars H, and rock-shafts E, having arms E', provided with rounded ends e, adapted to set into the channels of said bars H, substantially as set forth.

4. The combination of fixed grate-bars B with vertically and longitudinally reciprocating grate-bars D, having blocks D' projecting above their upper faces or edges, substantially as set forth.

5. In combination with the fixed register-frame A' and the sliding register-frame C, slotted respectively at P P', a vibrating arm which is pivoted in said fixed frame, socketed at its outer end to receive a shaker or other tool, and arranged to engage at its inner end with said sliding frame to open or close the register, as set forth.

In testimony whereof we, the said OMAR A. WADSWORTH and JOHN CONNOR, have hereunto set our hands.

JOHN CONNOR.

OMAR A. WADSWORTH.

Witnesses:

T. L. CLARK,

GEO. N. MILLER.