

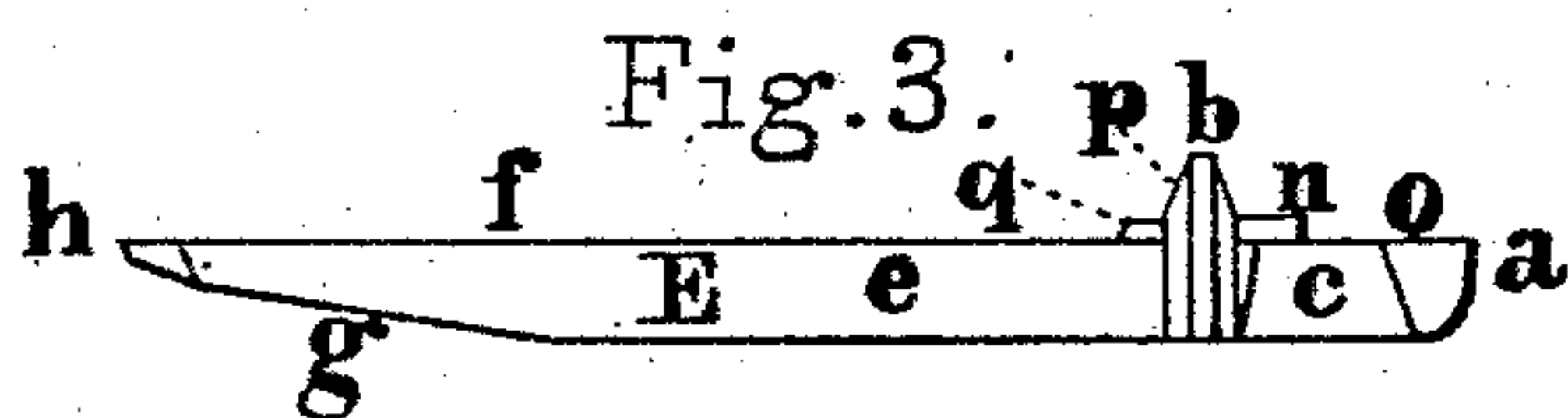
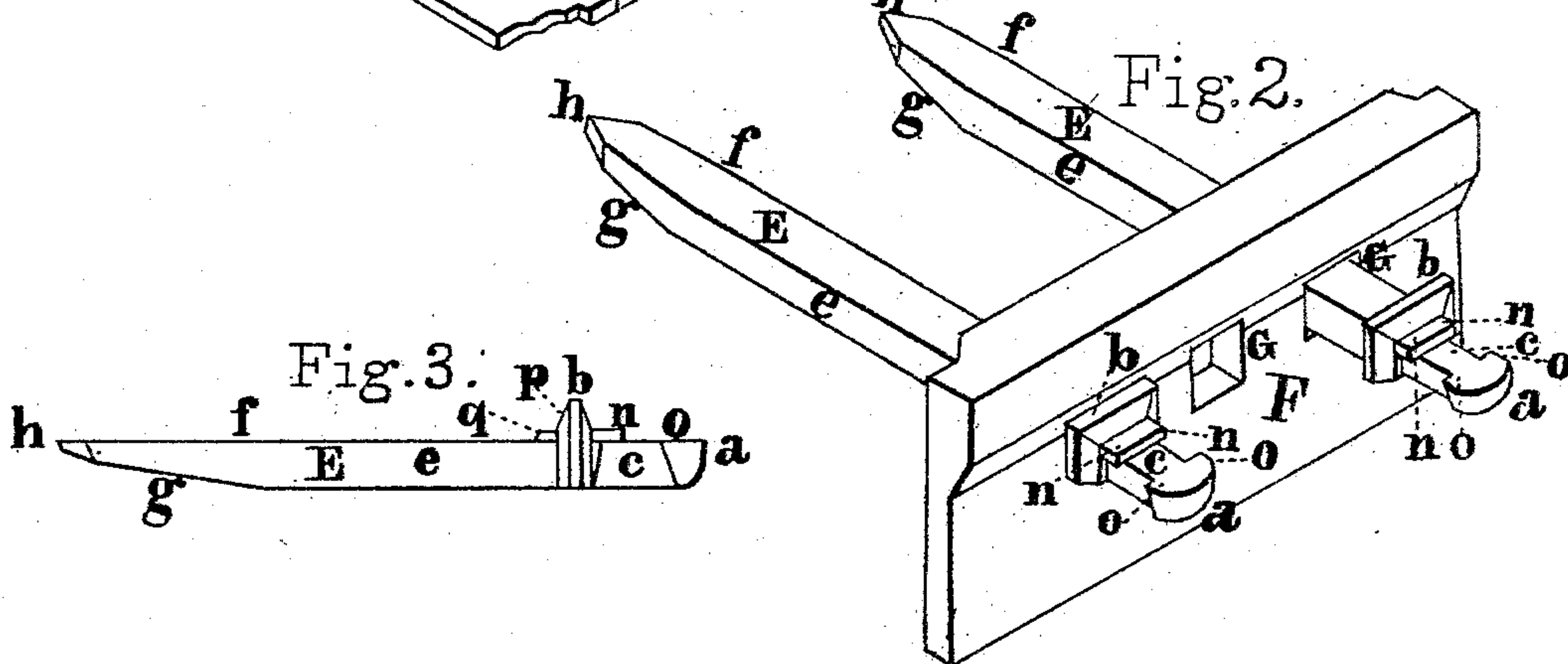
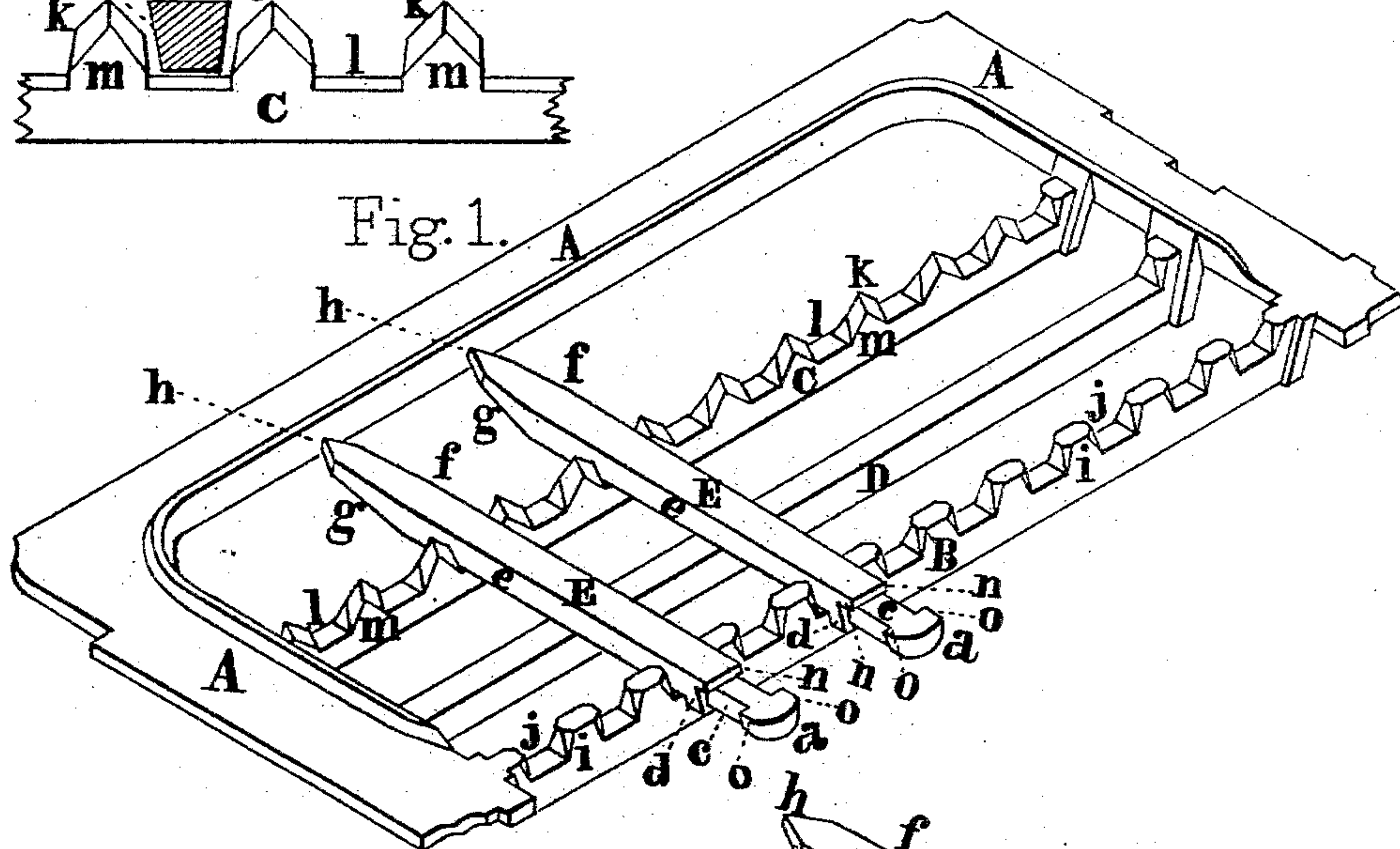
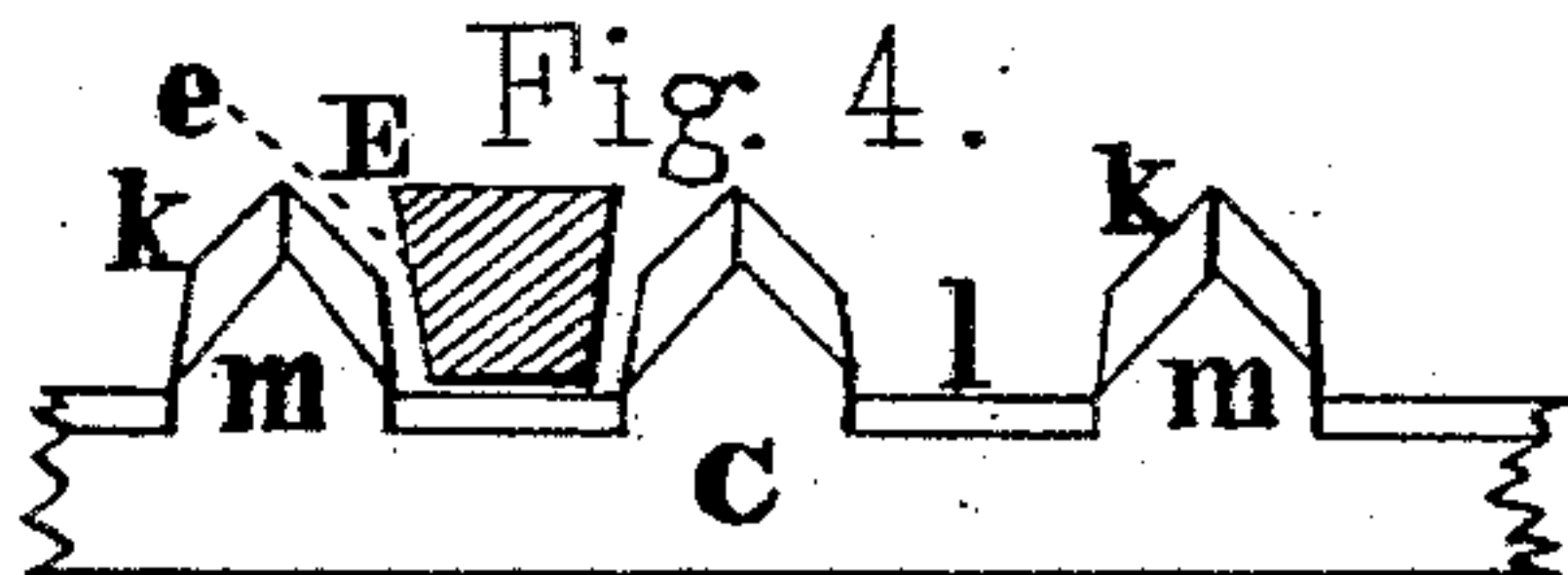
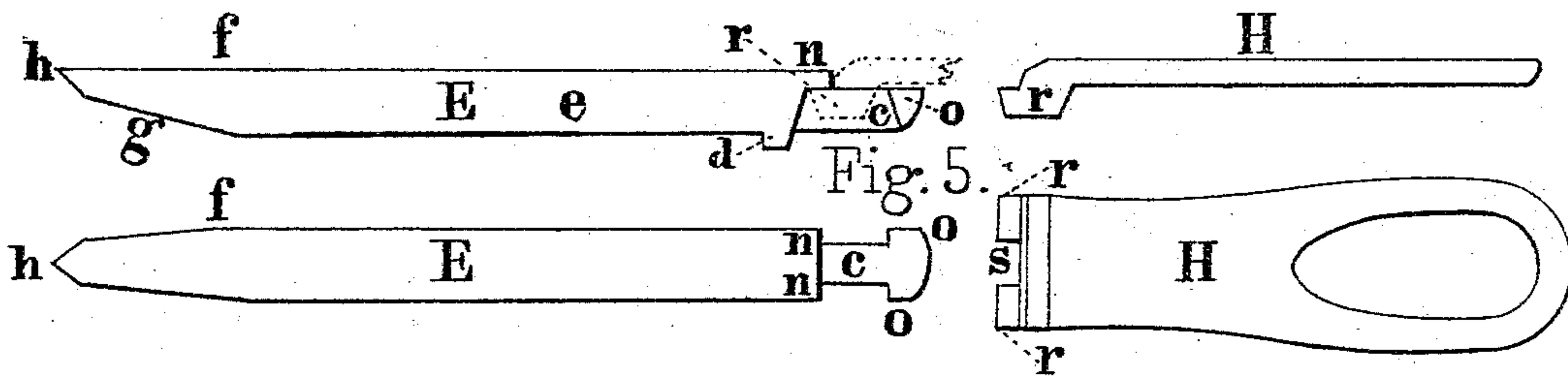
(No Model.)

A. W. DECROW.

GRATE FOR BURNING ANTHRACITE COAL.

No. 321,585.

Patented July 7, 1885.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## GRATE FOR BURNING ANTHRACITE COAL.

SPECIFICATION forming part of Letters Patent No. 321,585, dated July 7, 1885.

Application filed April 16, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ANSON WALTER DECROW, a citizen of the United States, residing at Bangor, in the county of Penobscot and State of Maine, have invented a new and useful Grate for Burning Anthracite Coal; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in that class of grates adapted for use in stoves, furnaces, or any description of fire-boxes intended for burning hard or anthracite coal, and arranged with separately or individually movable or sliding grate-bars.

The object of my invention is to so construct and arrange the sliding grate-bars and the guiding and supporting bars as to simplify and facilitate all the operations of handling the bars and cleaning out the clinkers. I attain these objects by the peculiar construction of the parts illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a grate in which the guiding and supporting bars are shown in their relation to the sliding grate-bars E E. This arrangement of parts is used when the grate is shut in by doors closing outside of the ends of the sliding grate-bars. Fig. 2 is a perspective view of an apertured front in which the sliding grate-bars E E pass through the apertures G G in the front of the furnace, and the ends *a a* project on the outside of the stove or furnace in front. Fig. 3 is a side view of a sliding bar with a collar, *b*, to close up the aperture G when the bar is in place. Fig. 4 is a side view of a part of the guiding and supporting bar C, and showing a cross-section of the sliding bar E. Fig. 5 is a top and side view of a sliding bar and a lifter designed to handle the sliding grate-bar.

Similar letters refer to corresponding parts throughout the several figures.

A is the frame of a grate as generally used in a stove, furnace, or fire-box where there is a door or opening outside of the ends *a a* of the sliding grate-bars E E, and inclosing the whole front when closed.

F is a separable band or front of a furnace or stove having the apertures G G, through

which the sliding grate-bars E E are passed when placed in the grate.

Grates for furnaces and stoves have long been constructed with separate sliding bars, but in all instances the sliding bars have been held at the proper distance apart by spurs or ridges formed upon and projecting from the sides of the bars, except in the case of round bars or square bars placed cornerwise to the bottom of the grate, when they have been clasped and partially surrounded by the orifices or recesses in the supporting rods or bars.

To avoid all difficulty of insertion and removal, I provide two or more supporting and guiding bars, B C, formed with standards or studs *i m*, projecting upward and separated by the intervening spaces, *j* and *l*, for the purpose of guiding the sliding bars into their proper relative positions and holding them at the proper distance apart when in use. I form the studs or standards *m m* on the bar C with the slanting or beveled tops *k*, so that when inserting the sliding bar E, if the end becomes raised above the supporting-bar C, the slant of the standard *m* will guide or draw the sliding bar E into its proper place in one of the spaces *l*, where it will be held by the lower part of the standard, the supporting-bar B being at the front of the grate. It is not necessary to slope the tops of the standards or studs *i* so much; but the standards and intervening spaces correspond in size and space with the standards and spaces on the supporting-bar C.

In grates in furnaces or fire-boxes where the sliding grate-bars are necessarily very long, plain intermediate supporting-bars, D, may be used, the guiding-bars being placed in the proper relative position to guide and hold in place the sliding grate-bars and preserve the proper distance between them.

Sliding bars have generally been formed tapering laterally at the inner end, as from *f* to *h*, but I also form my bar sloping upward from the bottom, as at *g*, for a suitable distance—say from *f* to *h*—in order to insure the end of the sliding bar to more readily catch on to the space *l* in the supporting-bar C and cause the bar E to rise to its proper level when fully pushed into the grate. I also form a lip or stop, *d*, on the bottom of the outer end of



the bar E, projecting downward and serving to catch against the bar B and prevent the bar E from passing too far into the grate. I also form the end *a* of the sliding grate-bar E with the narrow neck *c*, projecting cap-pieces *n n*, and lateral projections *o o*, to adapt the bar to be removed and handled, while heated, with a lifter formed very similarly to a stove-lifter but having two beaks or hooks, *r r*, separated by the space S, as shown at Fig. 5, to allow of hooking on over the neck C and under the projecting top or caps *n n*, the lateral projections *o o* preventing the lifter from slipping off while pulling the bar out of the grate. The sliding bar thus formed and constructed is shown in perspective in Fig. 1, and a top and side view of the same with a top and side view of a suitable lifter is shown at Fig. 5.

In cases where it is desirable or necessary to have the sliding grate-bars project through the front of the stove or furnace, an apertured band or front is provided in front of and entirely independent and outside of the bar B, and having the apertures G G corresponding to the spaces *l l* on the guiding-bar C. The apertures G must necessarily be enough larger than the sliding bars to allow the bars to pass in and out easily and freely, and in order to close the apertures and prevent too much air passing in and out around the bars, I form the shoulder *q* on top of the outer end of the bar E, which nearly or quite fills the upper portion of the aperture, and I form the collar *b* on the top and both sides of the outside end of the bar E and having the face *p* beveled to fit up closely against and by reason of its beveled face partly into the aperture G, preventing all air from passing through.

It will be observed that my invention is very materially different from Patent No. 8,732, dated February 17, 1852, to F. Armstrong, which relates to the formation of jogs on the bars for the purpose of preserving the spaces; also from Patent No. 37,933, March 17, 1863, to W. Wright, in which the sliding grate-bars are partially clasped in guiding-bars, the handle being integral with the bar and projecting through the front of the furnace, and are liable to become very much heated, and are inconveniently in the way and unhandy to operate; and also from Patent No. 40,712, November 24, 1863, to G. L. Smith, wherein the spacing jogs or spurs are integral with the bars and the bottom sides of the ends of the bars are parallel longitudinally to the top sides.

The sides or edges *e* of my sliding grate-bars are parallel longitudinally as far as the point *f*, and entirely free from any jogs or spurs from the front of the grate as far back as *f*, where they commence to taper laterally, and the bottom commences to slope gradually upward toward the top. The sides *e* of the sliding bar pitch outward from the bottom to the top, making the bar wider at the top and rendering it impossible for anything to clog between the bars.

Although separately or individually movable and sliding grate-bars have long been known and used, there has always been more or less trouble and uncertainty in using them, owing to the great imperfections of construction and relative arrangement of other parts of the grate; and my improvements are intended to remedy existing defects and render the use of them more practicable and convenient.

I do not claim a sliding grate-bar in itself as it has ever been constructed and used, nor do I claim anything shown or described in the patents to Ashcroft, No. 202,323, April 16, 1878, and Winans, No. 19,889, April 6, 1858; but

What I do claim, and desire to secure by Letters Patent, is—

1. In a grate designed for burning hard or anthracite coal in a stove, furnace, or any kind of a fire-box, the sliding grate-bar E, formed at the outer end, *a*, with the lateral spurs or projections *o o*, recessed narrow neck *c*, projecting caps or catches *n n*, stop *d*, so arranged as to adapt it to be grasped and operated by a suitably-formed lifter, H, acting upon the principle of a common stove-lifter, as shown and described.

2. In a grate for burning hard or anthracite coal, the sliding bar E, formed with the projections *o o*, neck *c*, catches *n n*, and stop *d*, and having the inner end of the bar formed sloping upward from the bottom toward the top in the distance from *f* to *h*, as shown at *g*, all as shown and described.

3. In a grate for burning hard coal, the sliding bar E, constructed as shown and described, in combination with the lifter H, formed with the two beaks or hooks *r r*, separated by the space *s*, the lifter operating to raise and draw out or push in the sliding grate-bar E into the grate, as shown and described.

4. In a grate designed for use in a stove, furnace, or fire-box, having separately-movable grate-bars E E, and supporting-bars C, formed with studs or standards, the studs or standards *m m*, formed with the tops beveled or sloping at a suitable angle from the middle each way in such a manner as to guide or slide the bars E E into the spaces *l l*, between the studs *m m*, as shown and described.

5. In a grate for burning hard or anthracite coal in any fire-box or chamber, the separately-sliding grate-bars E E, having the inner ends formed sloping from the bottom upward, as at *g*, and the outer ends formed as shown, to adapt them to be lifted and operated by a suitable lifter, as H, supported and guided by the supporting and guiding bars B C, formed with the vertical standards *i m*, and intervening spaces, *j l*, arranged and operating in connection with any desirable number of plain supporting-bars, D, arranged immediately to the supporting and guiding bars B C.



6. In a grate adapted to a stove, furnace, or  
fire-box designed for burning hard or anthra-  
cite coal, the combination of the frame A, guid-  
ing and supporting bar B, formed with the  
5 vertical standards *i* and spaces *j*, plain sup-  
porting-bars D, guiding and supporting bar  
C, formed with the sloping-topped standards  
*m* and spaces *l*, and the sliding grate-bars E,  
formed with the inner end sloping upward, as

at *g*, and the outer end formed with the stop 10  
*d* and collar *b*, the caps or catches *n n*, neck  
*e*, and lateral projections *o o*, and operated by  
the detachable lifter H, all formed and ar-  
ranged as shown and described.

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Witnesses:

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