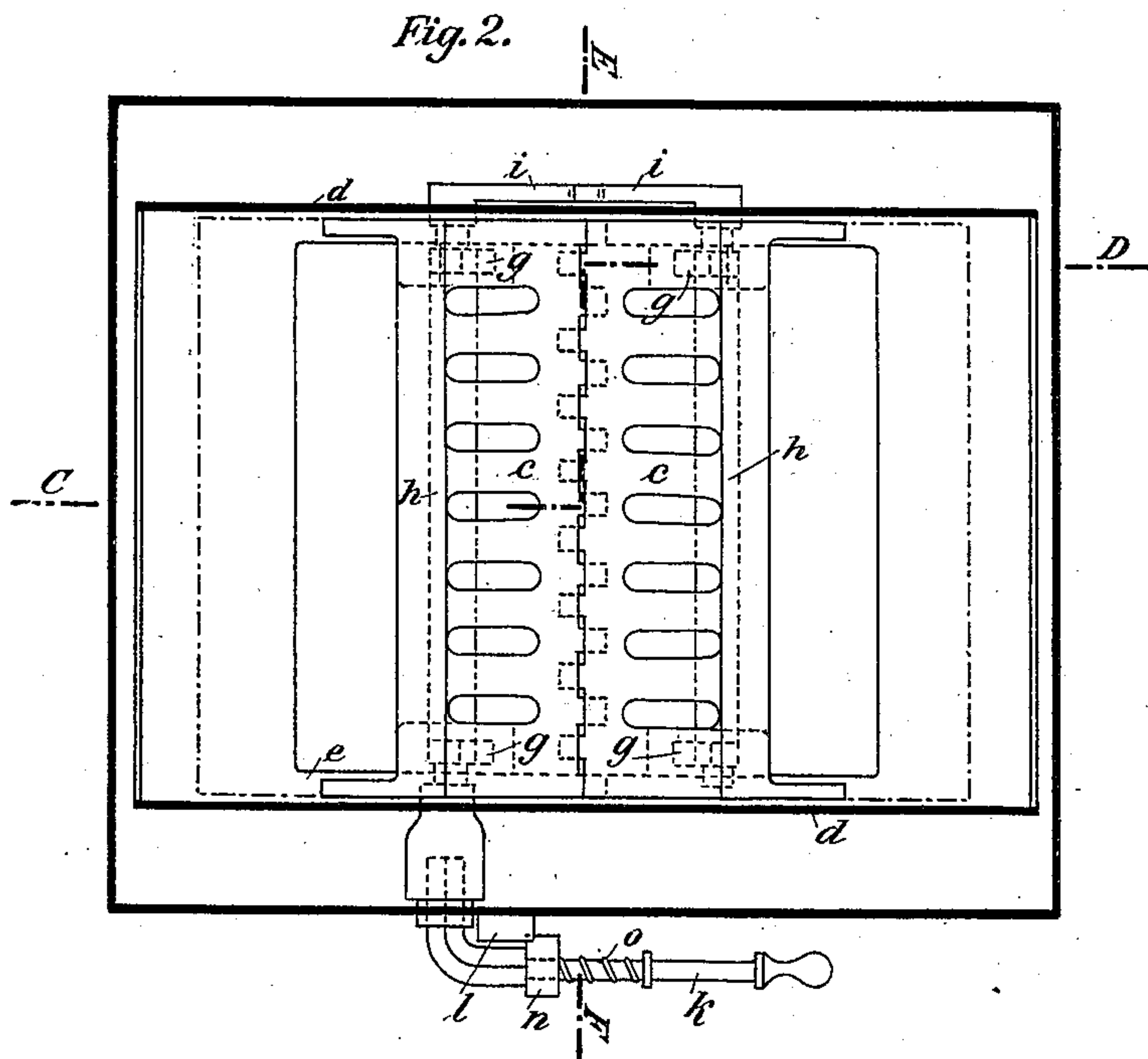
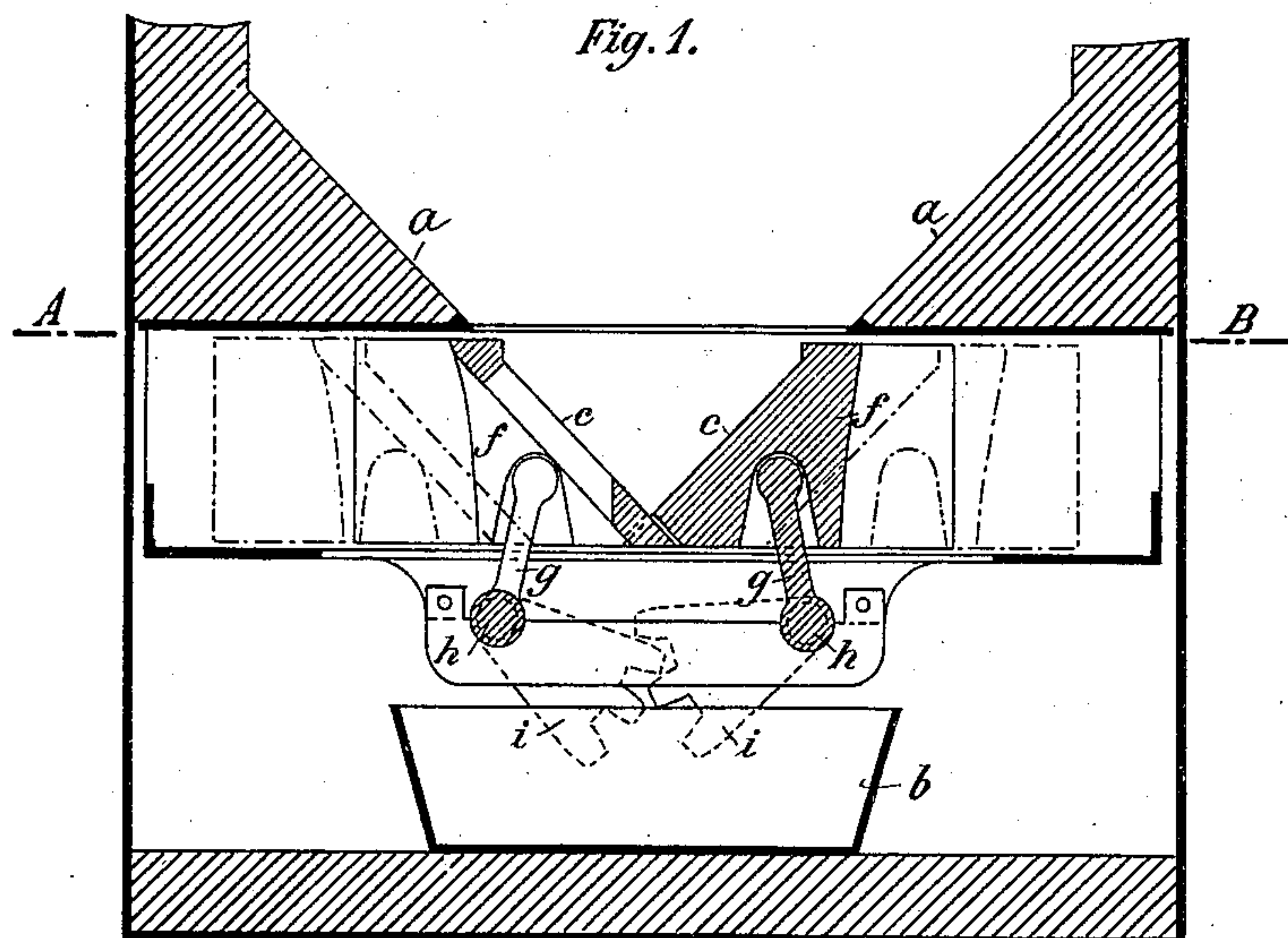


No. 886,727.

PATENTED MAY 5, 1908.

A. B. RECK.
MOVABLE GRATE.
APPLICATION FILED OCT. 23, 1906.

3 SHEETS—SHEET 1.



WITNESSES
W. P. Burke
W. P. Burke

INVENTOR
ANDERS BORCH RECK
By *Richardson*
ATTYS

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3 SHEETS—SHEET 2.

Fig. 3.

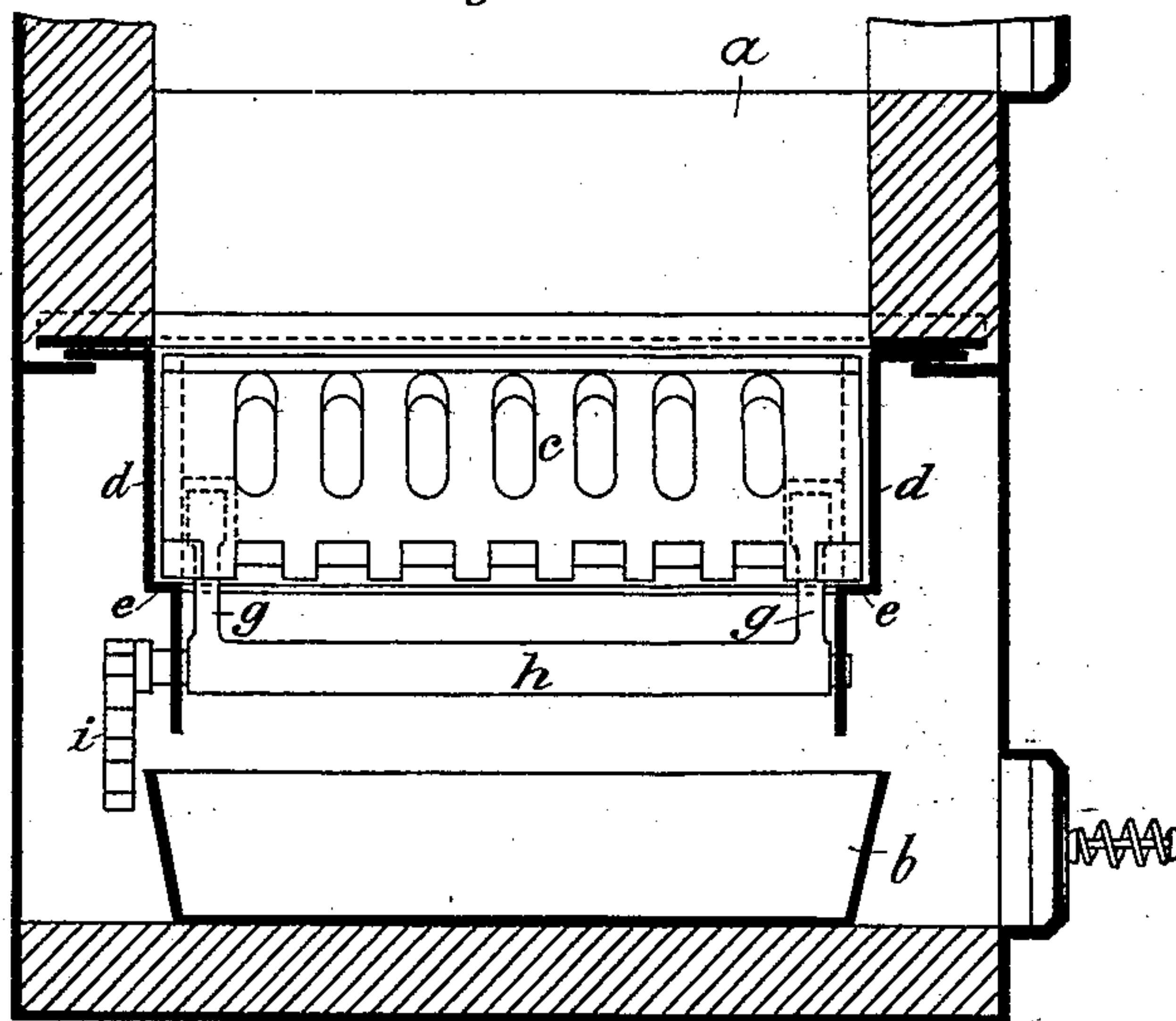
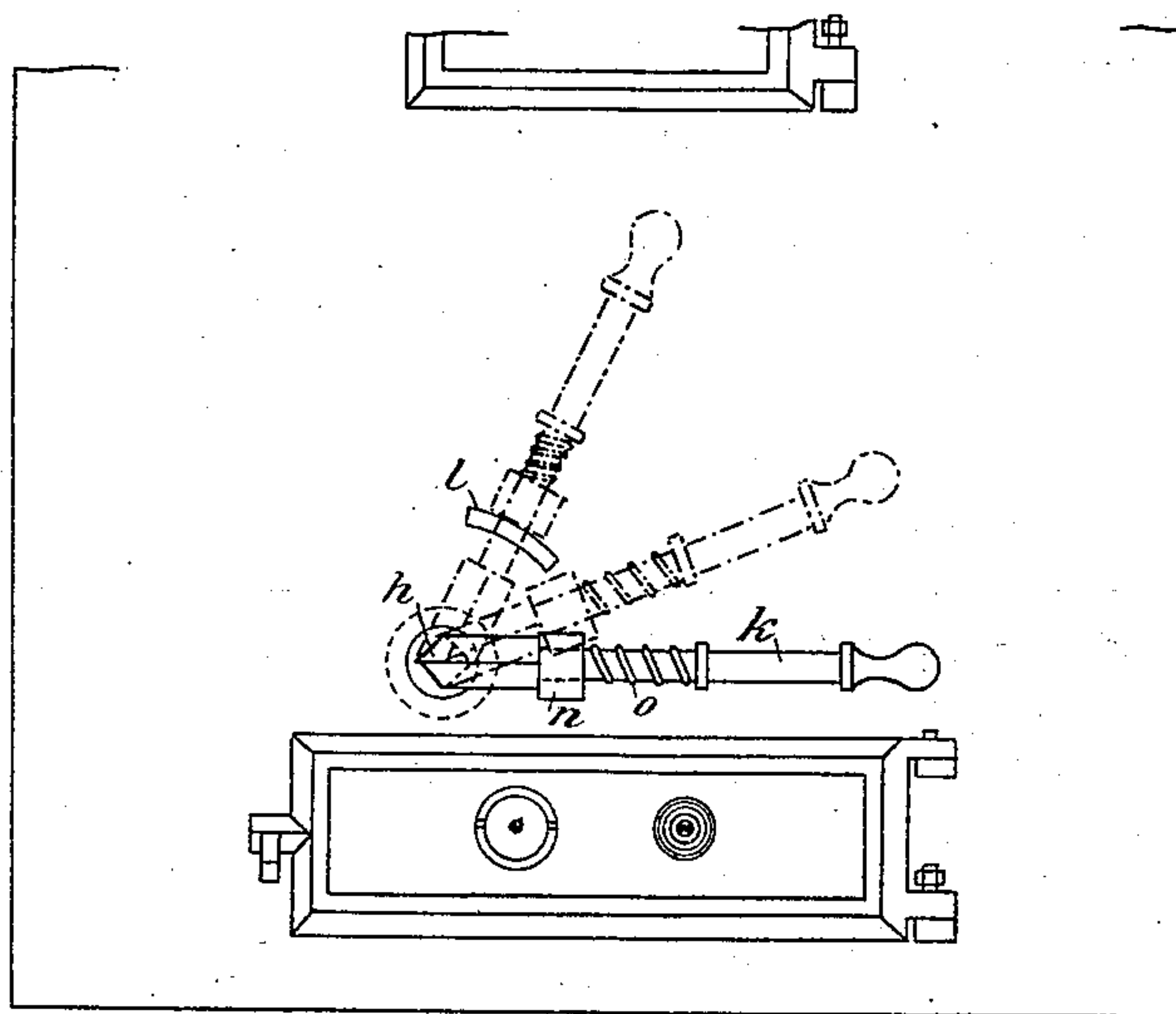


Fig. 4.



WITNESSES

W. P. Burke

W. P. Burke

INVENTOR

ANDERS BORCH RECK

BY *Richardson*

ATTY

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3 SHEETS—SHEET 3.

Fig. 5.

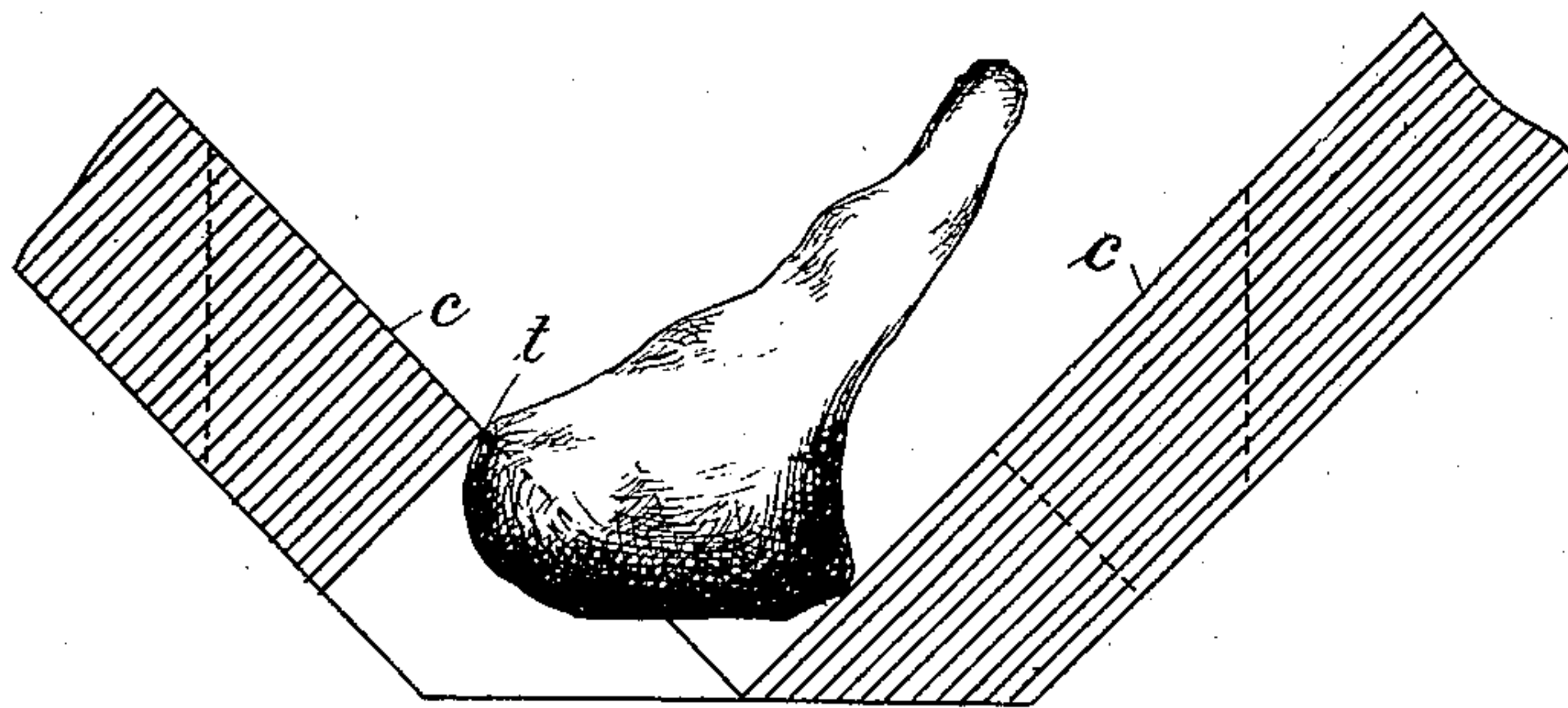
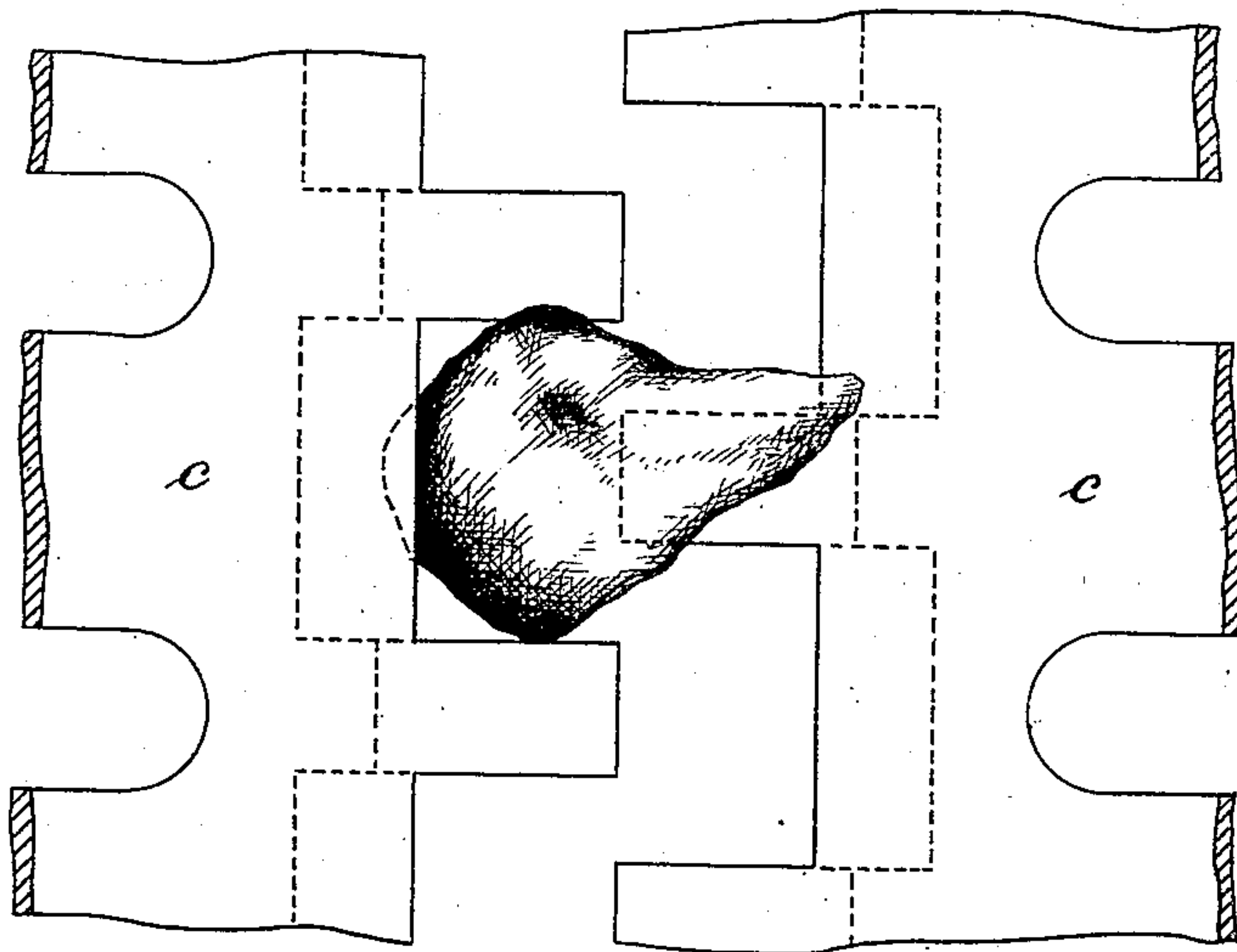


Fig. 6.



WITNESSES

W. P. Burke
McGinty

INVENTOR

ANDERS BORCH RECK

BY *Richard H.*

ATTYS.

UNITED STATES PATENT OFFICE.

ANDERS BORCH RECK, OF HELLERUP, DENMARK.

MOVABLE GRATE.

No. 886,727.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed October 23, 1906. Serial No. 340,158.

To all whom it may concern:

Be it known that I, ANDERS BORCH RECK, captain, a citizen of Denmark, residing at Christiansvej 16, Hellerup, in the Kingdom of Denmark, have invented new and useful Improvements in Movable Grates, of which the following is a specification.

This invention relates to a movable grate.

Movable grates are now nearly always of one of the following two constructions. By one construction the grate has a reciprocating motion in its own plane, either rectilinear or rotating (the latter construction is used especially in the case of round grates). It is evident that the object of the movement: to set the fuel on the grate in so quick a motion as to cause the ashes to drop down, is gained to no great extent, if the grate is moved only in its own plane, as coals and clinkers will soon find a position in which they are almost unaffected by the movements of the grate beneath. By the other construction the grate is divided into two or more parts (bars), at the ends of which are pivots, resting in bearings so that the bars can be turned. The bars are generally connected with each other so that they all turn at the same time and have moreover usually such a form that projecting parts of the bars, *e. g.* teeth on their sides, during the motion rise above the ordinary surface of the grate thus setting the fuel on the grate in motion. A serious drawback to grates with movable parts of this construction is the ease with which both burning coals and hard clinkers get jammed between the bars whenever the projecting parts on the bars (teeth) during the motion backwards and forwards are turned upwards and come in contact with the fire. But if hard clinkers get stuck between the bars in this manner while the teeth are turned upwards, not only the teeth but the grate-bars themselves will be apt to get red hot and be destroyed. The advantage of this construction as compared with the former, a greater shaking of the fuel and accordingly a brighter fire, is thus secured only at the sacrifice of the duration of the grate.

My invention principally consists in giving the movable parts of the grate such a form that the surfaces supporting the fuel are sloping down against narrow intermediate spaces between the movable parts of the

grate—or between these parts and the fixed sides of the fire pot—the said parts being moreover movable horizontally backwards and forwards in a transverse direction of the narrow spaces. Owing to the angle between the surfaces supporting the fuel and the shifting plane, the shifting of each separate movable part of the grate will necessarily displace the fuel thereon so as to set it in quick motion. Moreover, the slope of the surfaces down against the said narrow space, the aperture of which is alternately increased and diminished during the motion of the grate, will quickly cause all the clinkers to sink down to the narrow space, where by the blows received from the edges of the movable parts of the grate during the motion of the same they will soon be made small enough to be able to drop down into the ash-pit.

A further advantage of the construction is that when the fuel in the fire-pot is so far consumed that only a mixture of a small quantity of embers and a larger quantity of ashes remains, the slope of the surfaces of the movable parts of the grate will cause the ashes to fall down over the embers which are thus protected against combustion for several hours. Stoves, fitted with grates of this construction, can therefore be kept burning even if attended to only once or twice in 24 hours. Stoves with the said grate will therefore burn not only coal and coke but wood and peat, which fuel in most other stoves can only be used, provided they are attended to and filled at rather short intervals.

The construction of the grate is shown in the figures in the accompanying drawings which represent a form of the invention suitable for a stove.

Figures 1 and 3 are vertical sections of fire-pot and grate respectively on the lines C. D. and E. F. in Fig. 2, Fig. 2 is a horizontal section on the line A. B. in Fig. 1, and Fig. 4 represents a front view of a stove showing the operating handle of the grate in various positions. Figs. 5 and 6 are respectively a section and a plan drawing on a larger scale of the teeth of the grate, crushing a piece of clinker.

The fire-pot of the stove is indicated by *a* and its ash-pit by *b*.

In the drawing the grate itself is shown as

consisting of two opposite parts *c*, the upper surfaces of which are both sloping down against the spaces between the parts. These parts which are shown as provided with apertures like an ordinary grate are movable in a horizontal plane, being loosely placed in and guided by a frame, the inner side of which is for this purpose provided with a projecting edge *e*, see Fig. 3, to support the said parts. The length of the parts exactly corresponds to the internal distance between the two vertical side-walls *d* of the frame facing each other, the front-wall and the back-wall, which prevent the said parts from being moved in a longitudinal direction. On the other hand they may be moved in a transverse direction, the frame being much broader in this direction than the two parts put together and the movement may be made in the manner indicated in the drawing, as the underside of each of the parts is at either end provided with projecting lugs *f*, between which and the parts are cavities into which gear a corresponding number of arms *g*, placed on the shafts *h*. To make the movements of the two parts interdependent one shaft is connected with the other by means of teeth on the arms *i* on the shafts; therefore only one of the shafts is shown as passing through the front-plate of the stove and provided with the handle *k*.

It will be readily understood that an up and down movement of the handle *k* will produce a reciprocating lateral motion of the parts *c*, which will set the fuel in motion and cause the ashes to drop down into the ash-pit, and by a quick movement of the handle the lower edges of the parts may be knocked against each other with great force and will wholly or partly crush the great and small clinkers which during the motion will glide down the sloping sides of the parts and at last get right down between their edges. Especially if the lower vertical edges of these parts as shown in Figs. 5 and 6 are provided with teeth which gear together, the crushing of clinkers will be easily effected by the grate. Fig. 5 shows the way in which the clinkers supported by the teeth are hit by the sharp edges *t* between the teeth on the parts *c*, when the parts are brought against each other by a down movement of the handle *k*. By repeating this movement of the handle with some force, a clinker in the position shown in Fig. 5 will soon be reduced to pieces small enough to pass between the teeth down into the ash-pit.

The reciprocating motion of the parts need not be great to separate the ashes from the fuel and to crush the clinkers at the bottom of the fuel magazine, so that they may drop down into the ash-pit through the grate together with the ashes. A stopper 1, reducing the movement of the handle *k* and ac-

cordingly that of the parts, may therefore be placed on the front-plate of the stove.

If it is desired simply to empty the fire-pot of the whole of its contents, or if so large clinkers have gathered together at the bottom of the fuel magazine that it is difficult to have them crushed by the parts, a slide on the handle *k* can be easily adjusted so as to admit of a greater movement than that generally required. By this greater movement the parts can be so far removed from each other that also large clinkers can drop down into the ash-pit between the parts without first being crushed. In Figs. 2 and 4 the handle is shown as fitted with a slide *n*, which is kept in its proper position by means of the spring *o*. When the handle is moved in the direction of the stopper 1, the slide, if in its proper position, will strike the end of the stopper so as to check the movement of the handle in the mid-position shown in Fig. 4. But if the slide *n* is moved a sufficient distance along the handle, the spring being pressed together, it will pass the end of the stopper, and the movement will not be checked, until the parts have reached the limit of their movements. The distance between the parts will then be great enough to admit of even large clinkers dropping down into the ash-pit.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A grate comprising oppositely disposed inclined parts diverging upwardly and separated by a narrow space at their lower edges, means for supporting said parts to permit horizontal reciprocating movement thereof, means for moving said parts in directions opposite to each other and across the space between them to alternately increase and decrease the said space, substantially as described.

2. A grate comprising oppositely disposed inclined parts diverging upwardly and separated by a narrow space at their lower edges, means for supporting said parts to permit horizontal reciprocating movement thereof, means for moving said parts in directions opposite to each other and across the space between them to alternately increase and decrease the said space, said inclined parts having teeth at their lower edges, substantially as described.

3. A grate comprising oppositely disposed inclined parts diverging upwardly and separated by a narrow space at their lower edges, means for supporting said parts to permit horizontal reciprocating movement thereof, means for moving said parts in directions opposite to each other and across the space between them to alternately increase and decrease the said space, and means for varying the limits of the movement of the said parts.

4. A grate consisting of parallel inclined
parts provided with teeth, at their lower
edges; a handle for reciprocating said parts
horizontally, a movable slide on said han-
5 dle and a fixed stop engaging with the slide
so as to vary the limits of movement of the
movable parts.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

ANDERS BORCH RECK.

Witnesses:

ALF. CARLUN.

I. SCHELLERUJI.