

No. 607,385.

Patented July 12, 1898.

**J. PROCTOR.
COKING STOKER.**

(Application filed May 3, 1897.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 2.

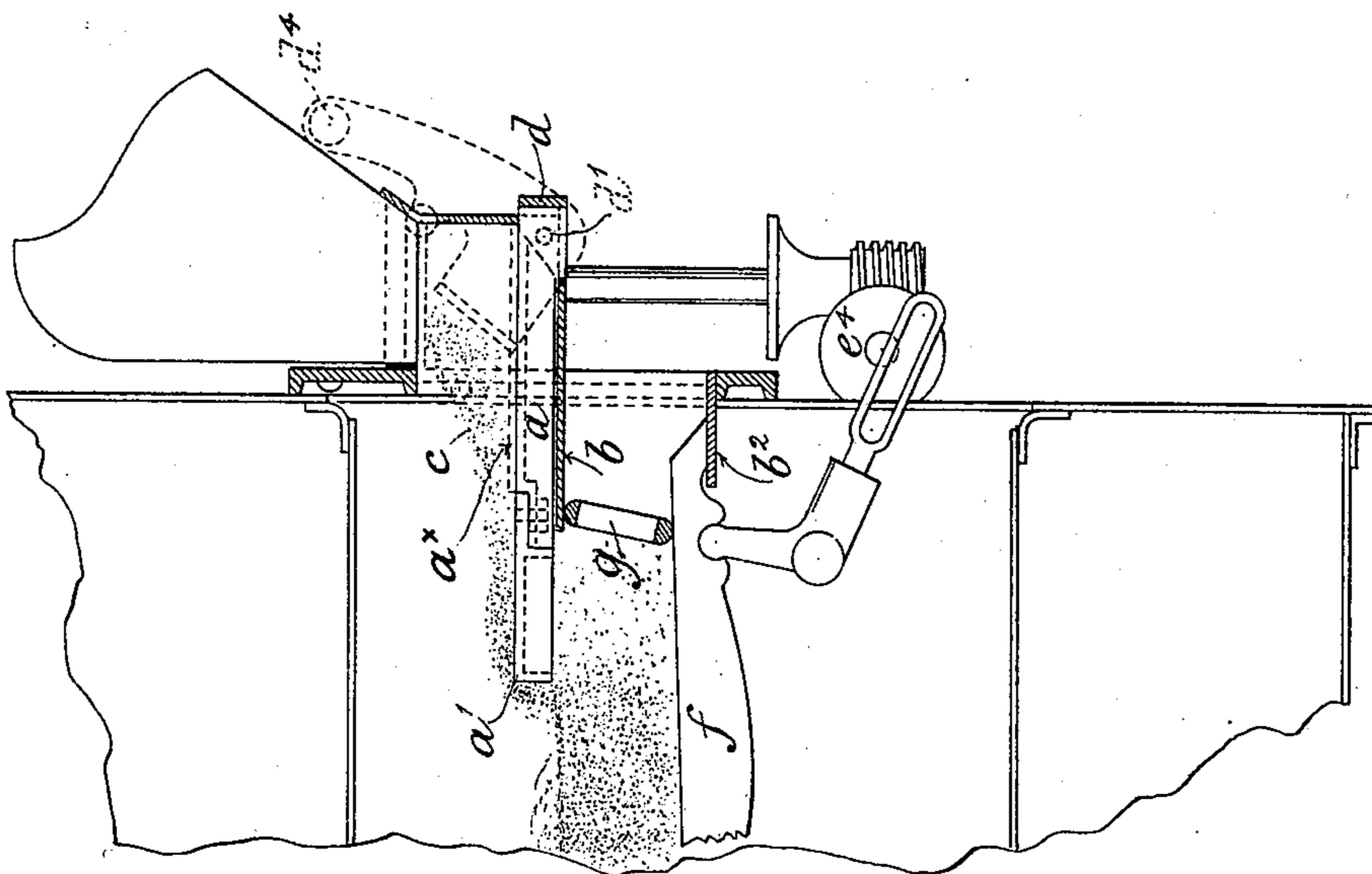
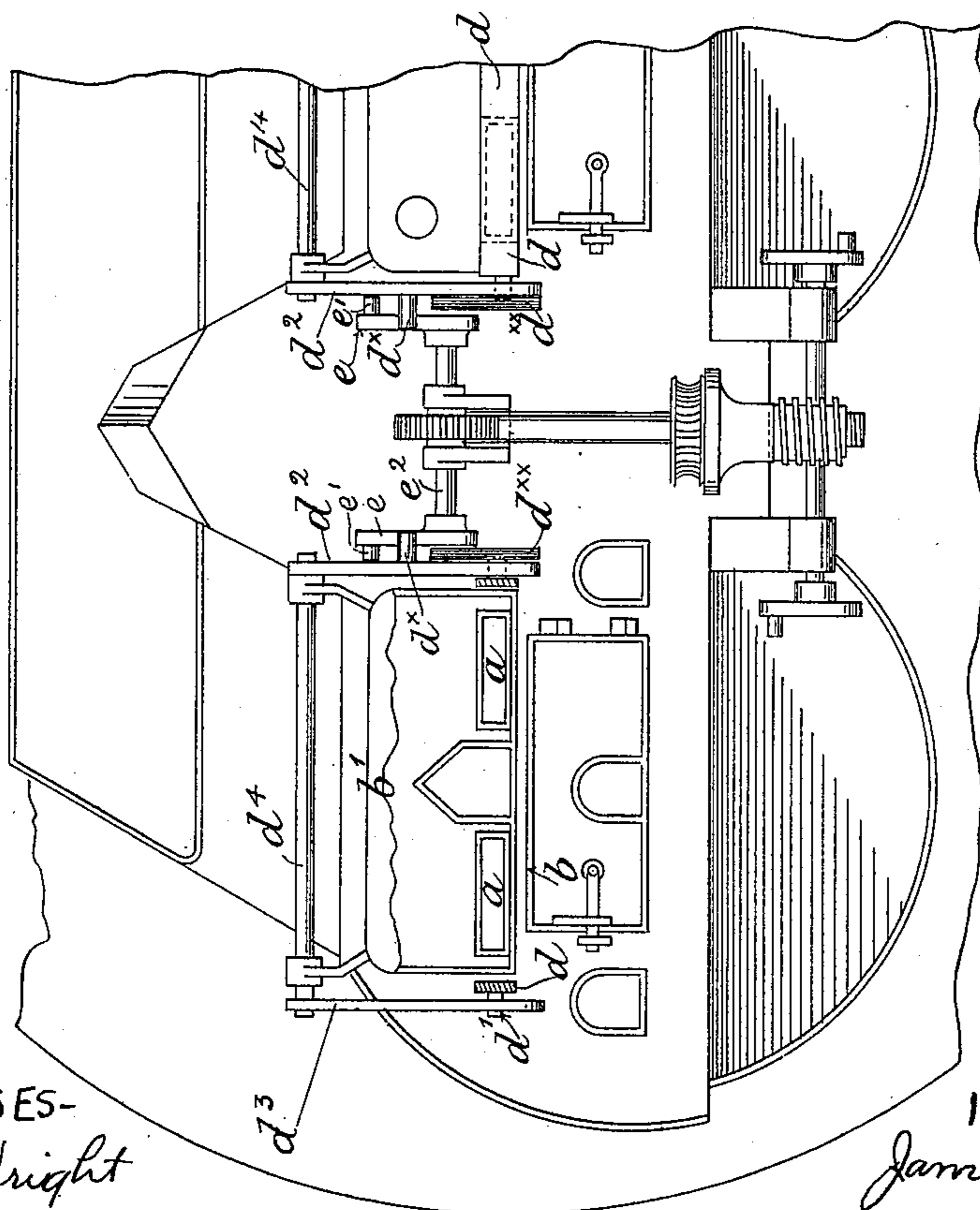


FIG. 1.



-WITNESSES-

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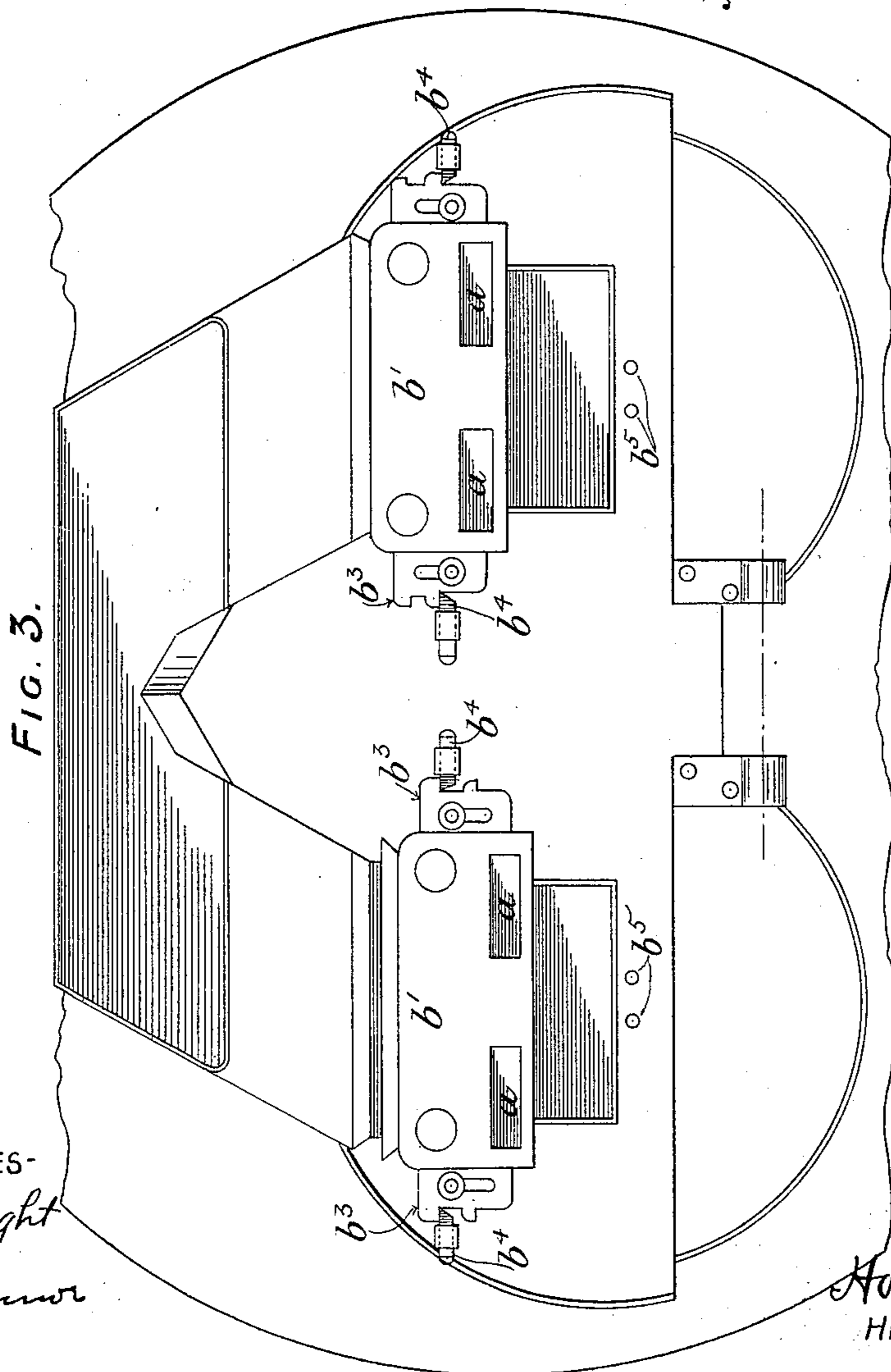
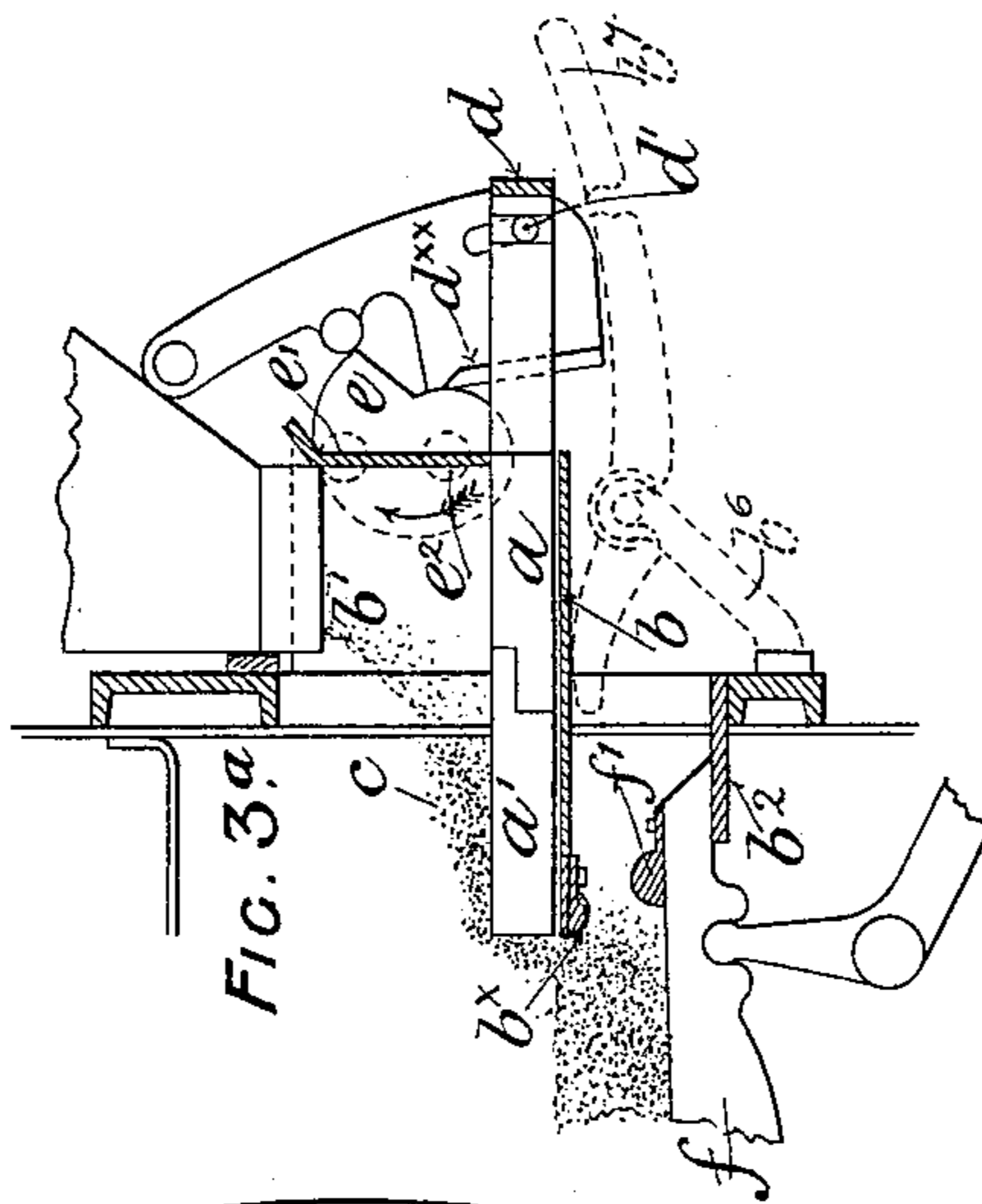
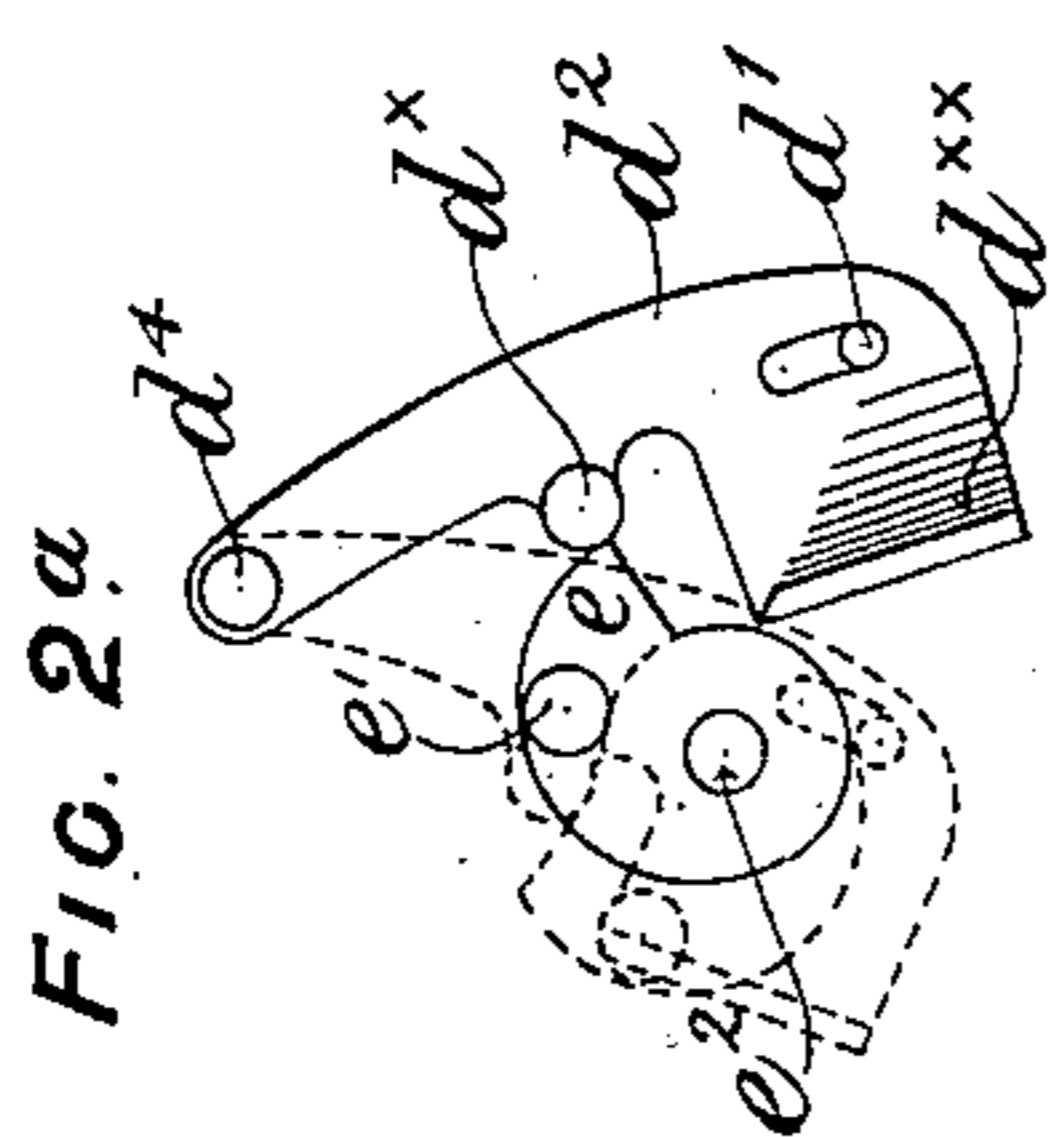
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WITNESSES-

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UNITED STATES PATENT OFFICE.

JAMES PROCTOR, OF BURNLEY, ENGLAND.

COKING-STOKER.

SPECIFICATION forming part of Letters Patent No. 607,385, dated July 12, 1898.

Application filed May 3, 1897. Serial No. 634,933. (No model.) Patented in England May 21, 1896, No. 11,139; in France November 28, 1896, No. 261,701, and in Spain February 15, 1897, No. 20,201.

To all whom it may concern:

Be it known that I, JAMES PROCTOR, a subject of the Queen of Great Britain, residing at Burnley, in the county of Lancaster, England, have invented new and useful Improvements in Coking-Stokers, (for which I have obtained English Patent No. 11,139, dated May 21, 1896; French Patent No. 261,701, dated November 28, 1896, and Spanish Patent No. 20,201, dated February 15, 1897,) of which the following is a specification.

This invention relates to that class of mechanical stokers for steam-boiler and other furnaces known as "coking-stokers," of which an example is shown in my Patent No. 454,379, dated June 16, 1891, the object being to simplify the construction and improve the action of such stokers.

This invention will be readily understood on reference to the accompanying drawings.

Figure 1 is a front view of a coking-stoker constructed according to my invention. Fig. 2 is a sectional elevation thereof. Fig. 3 shows a modification of the ram-box hereinafter referred to. Figs. 2^a and 3^a are detached views showing the action of the rams and other parts, as hereinafter described.

Instead of using two rams or pushers one below the other and having a scraper-plate between them for scraping the fuel from the top of the lower ram, as in the case of my stoker patented in Great Britain, No. 20,833, November 3, 1893, I make use of two rams *a a* or more (varying with the width of the furnace) moving in and out over the feed-plate or ram-box bottom *b*, arranged above the grid *g*.

The rams for pushing the coal from the box and upon the fire may be made thicker at the outer end or thinner at the inner end, so that it forms a step or shoulder, as seen by the dotted lines *a^x*, Fig. 2, which will help to move or push the fuel *c* forward, or the rams may be left parallel, as shown, and the coal will be carried forward onto the fire by resting on the top of the same as they move inward. The inner end *a'* of the ram *a* being exposed to the fire and most likely to burn is made detachable, (see Fig. 2,) so that it can be easily changed. When the rams *a a* have made the backward stroke or have receded

from out of the fire, the ends are in a line with the end of the box-bottom or feed-plate *b* before commencing their forward stroke, (see detached view Fig. 3^a,) and being surrounded or covered with coal the rams *a* in their traverse will carry forward the fuel *c* which is resting upon them, and the coal which is displaced will be replaced by that which is above it, thus preventing the coal that was upon the rams on their inward traverse from returning, and such fuel will be caused to fall off at the ends and sides of the rams, so that the coal will become partially coked before the next stroke. Thus the supply of fuel to the fire will be kept up by placing a layer of fuel on the fire at one stroke and skimming it forward after it has coked by the other stroke.

The ram may be actuated by any suitable means; but I propose to use the following mechanism, which I have invented for the purpose:

I connect the rams *a a* of each flue together by the front plate *d*, at either end of which is a pin *d'*, engaging in the slot of a rocking lever *d²* or *d³*, fixed upon a suitable shaft *d⁴*, mounted horizontally across the front of each hopper. This shaft is caused to rock by the inner lever *d²*, fixed thereon and oscillated by a crank-pin *e'* and a tappet or cam *e* upon a shaft *e²*, actuated by a worm and wheel; or the shaft *e²* may be driven by bevel-gear situated and driven in a similar manner to the lantern-wheel of my ordinary well-known stoker. The above-named tappet or cam *e* is formed as shown in Figs. 1, 2^a, and 3^a, and comes into contact with a projection *d^x* from the oscillating lever *d²*, above described, and draws the rams outward, and the crank-pin *e'* projects from the face of the tappet or cam *e* and is so situated that at the desired time it will come in contact with a projection *d^{x^x}* upon the lever *d²* and push it inward and thus push or draw in the rams. The projection *d^x* on the oscillating lever *d²*, actuated by the tappet or cam *e*, is considerably nearer to the shaft *d⁴* than the projection *d^{x^x}*, actuated by the crank-pin *e'*, and thus the outward motion of the rams is much more rapid than the inward motion and the

crank-pin e' can be so set, as shown, that there can be a long dwell in the motion of the rams when withdrawn, or the above arrangement may be made with bowls in or on the oscillating levers, and tappets or cams on the shaft e^2 made to suit them.

I propose to mount the feed-box b' in such a manner that although it is rather close to the dead-plate b^2 in its working position it can be raised, (with the rams, rocking-shaft, and levers d^2 d^3 ;) so as to vary the thickness of the fire to suit the quality of the coal, also for hand-firing, when required. This may be done in various ways, but I have illustrated the following means on the drawings, Figs. 3 and 3^a. In this modification, as shown, the lugs b^3 of the box b' are slotted and provided with sliding catches b^4 , which can support the feed-box b' in either position, as seen at Fig. 3, which shows one feed-box b' raised and one in working position. I provide holes b^5 in the stoker-front for attaching a bracket b^6 (shown dotted at Fig. 3^a) to form the fulcrum of a lever b^7 , by which the feed-box may be lifted. By this or a rack motion or other equivalent means to those last above described the accumulation of fuel on the fire-bars f is not so great at the mouth of the furnace as when the space for hand-firing is permanent, as shown at Figs. 1 and 2. In this case the grid g may be dispensed with and a piece of metal b^x fitted beneath the inner edge of the plate b to prevent the fire from burning it away. Also a similar piece f' of metal is fixed upon each bar f , as shown on Fig. 3^a, farther out than b^x to act as a fen-

der to keep the fire from rolling off the ends of the bars.

I claim as my invention—

1. In coking-stokers, the combination of a ram-box and rams separated from each other with spaces between them and sliding on the bottom thereof, with means for reciprocating said rams and causing them to carry the fuel on their surfaces into the furnace and then to be entirely withdrawn from the fire at the outward stroke thereof, and to distribute the fuel from their ends and sides as they recede, substantially as described.

2. A coking-stoker having reciprocating rams, in combination with oscillating levers adapted to engage therewith, projections d^x d^{xx} formed on one of said levers, and a revolving shaft carrying a cam provided with a pin, said cam and pin adapted to engage with the projections on the oscillating lever as and for the purpose set forth.

3. A coking-stoker having a vertically-adjustable ram-box and means for securing it in its elevated position, substantially as described.

4. Coking-stokers having vertically-adjustable ram-boxes with catches to support said ram-boxes in their elevated position, substantially as described.

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

JAMES PROCTOR.

Witnesses:

CHARLES A. DAVIES,
JNO. HUGHES.