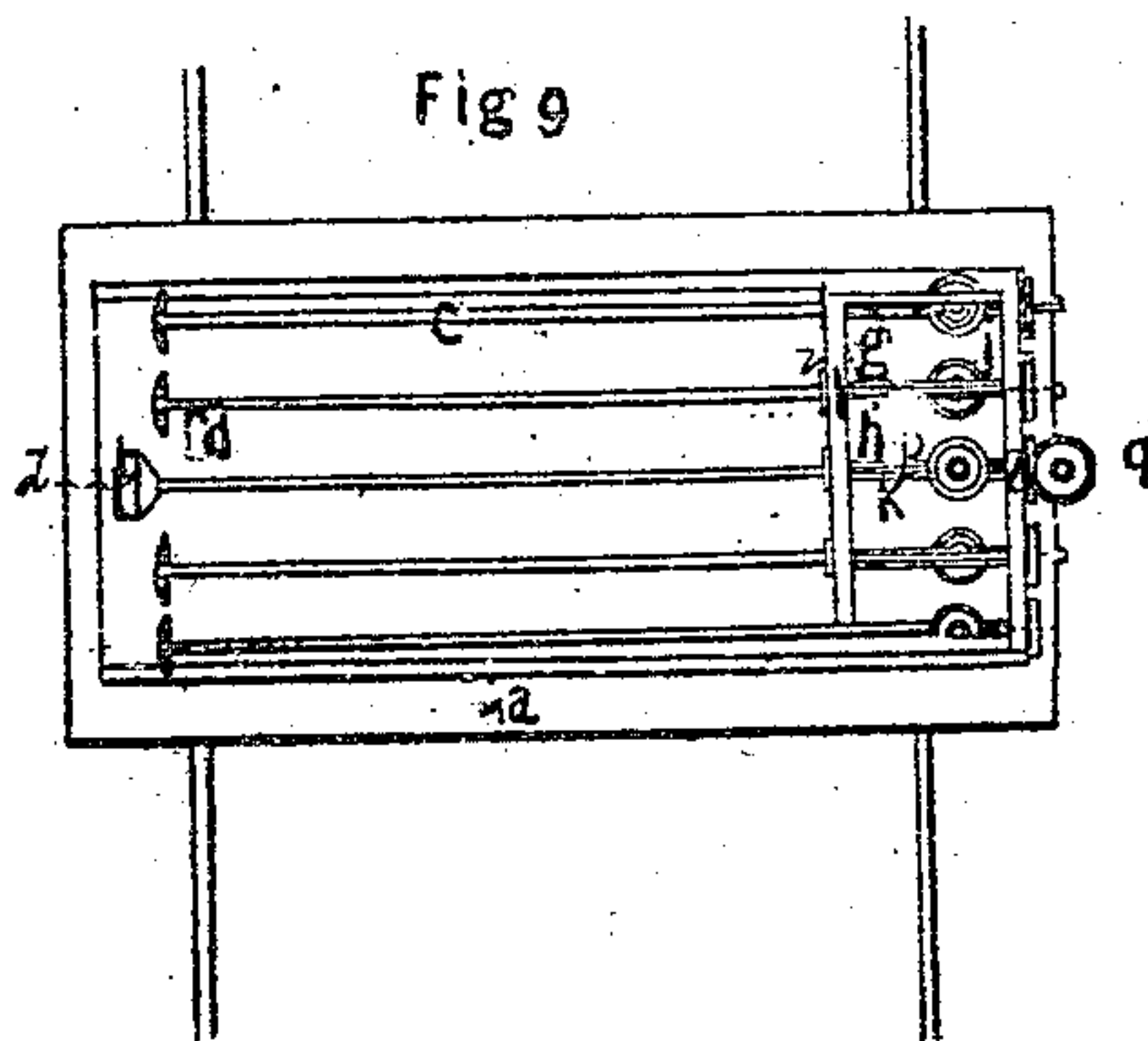
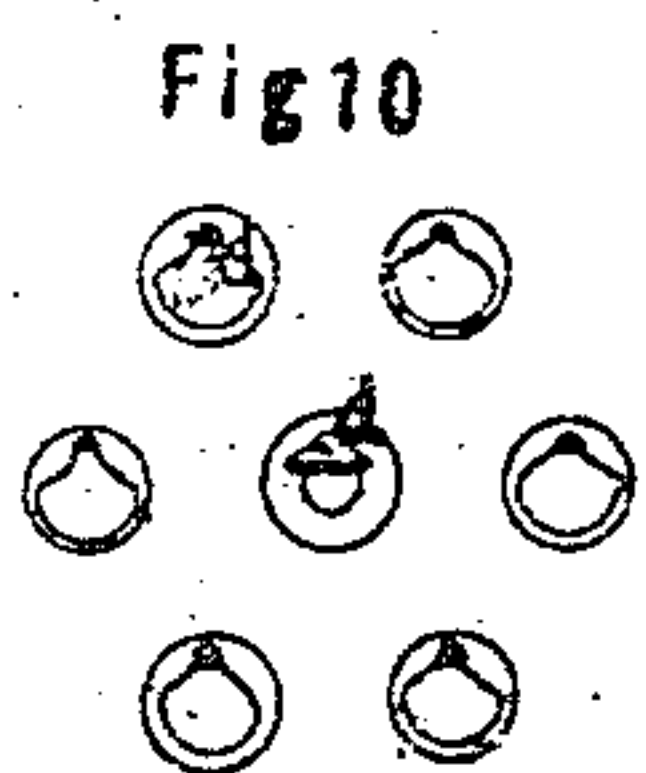
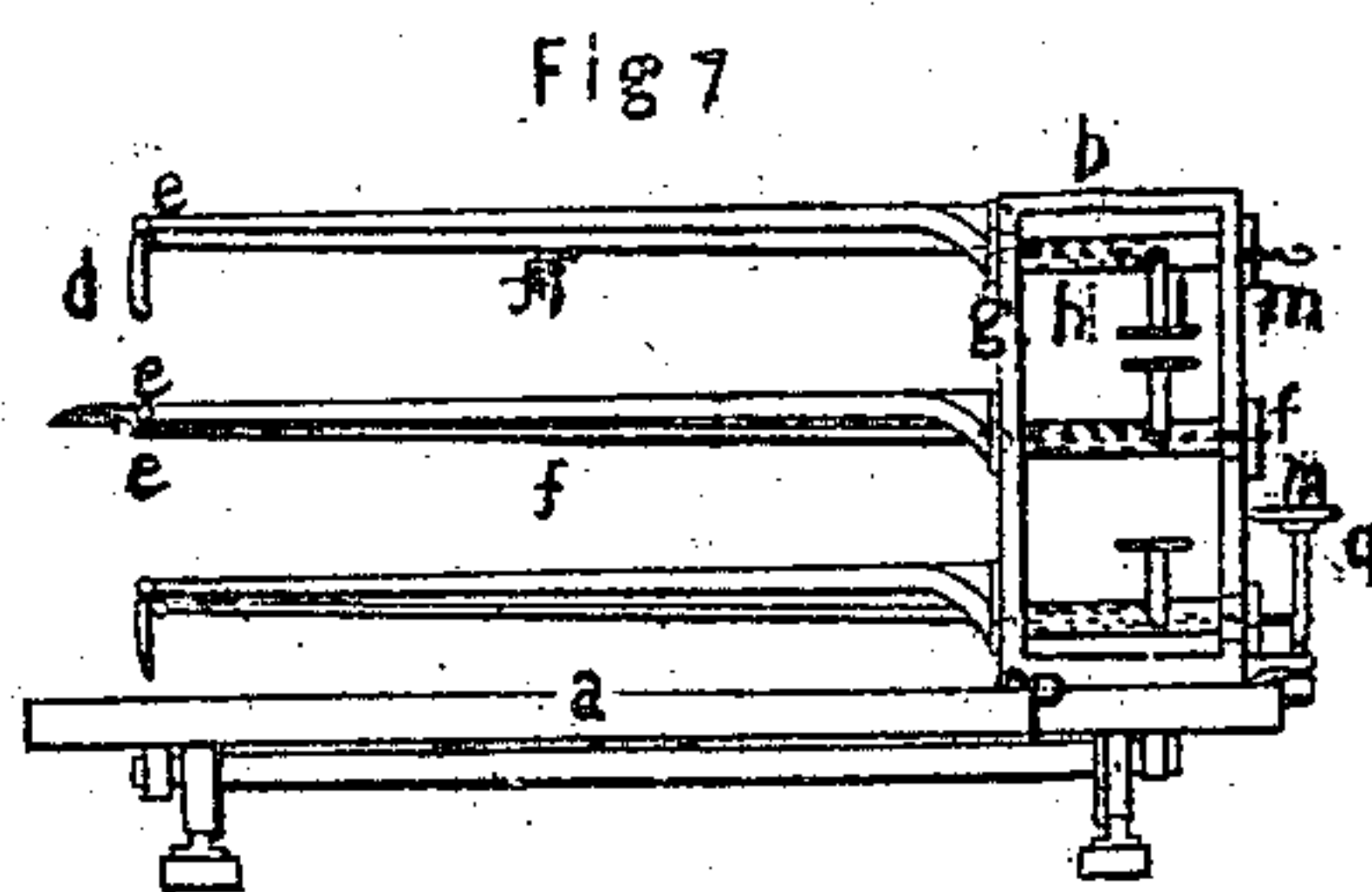
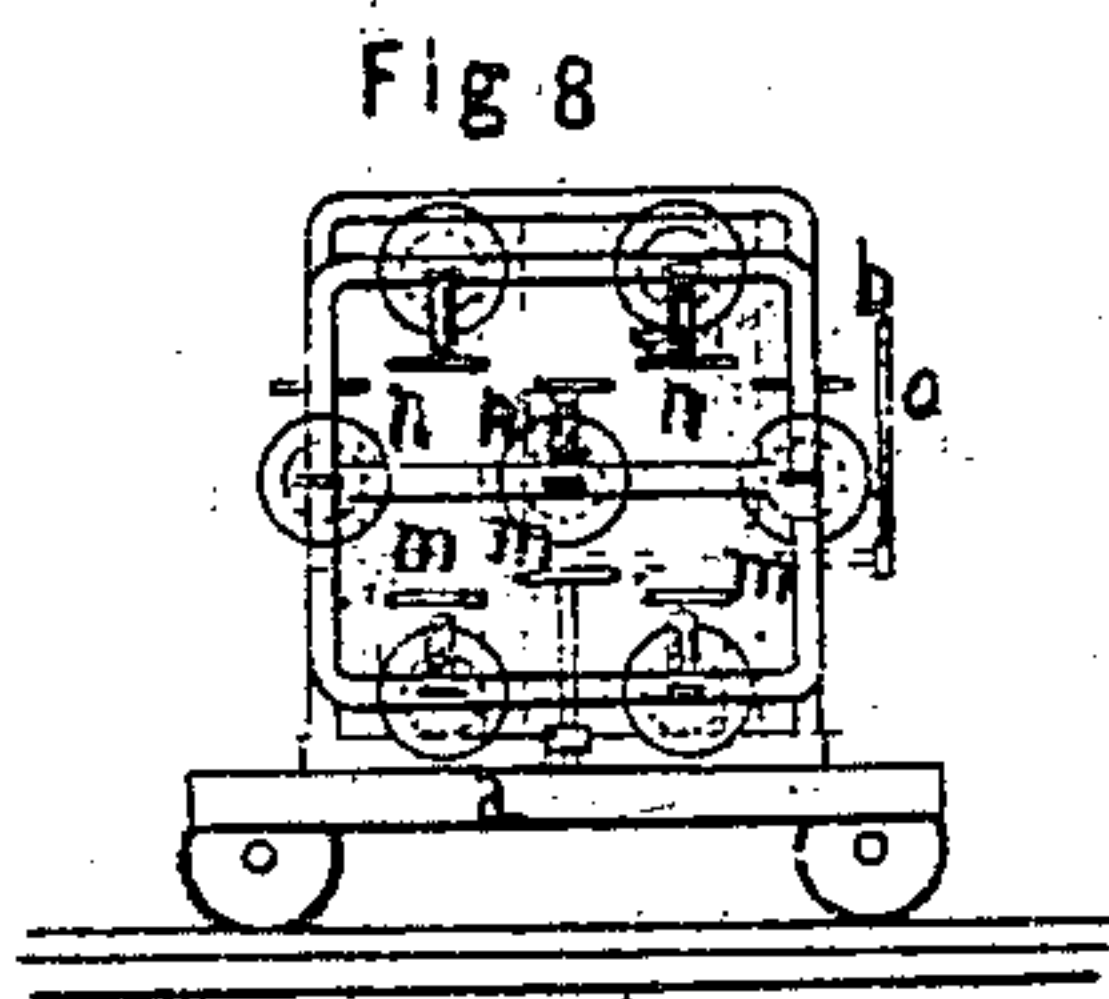
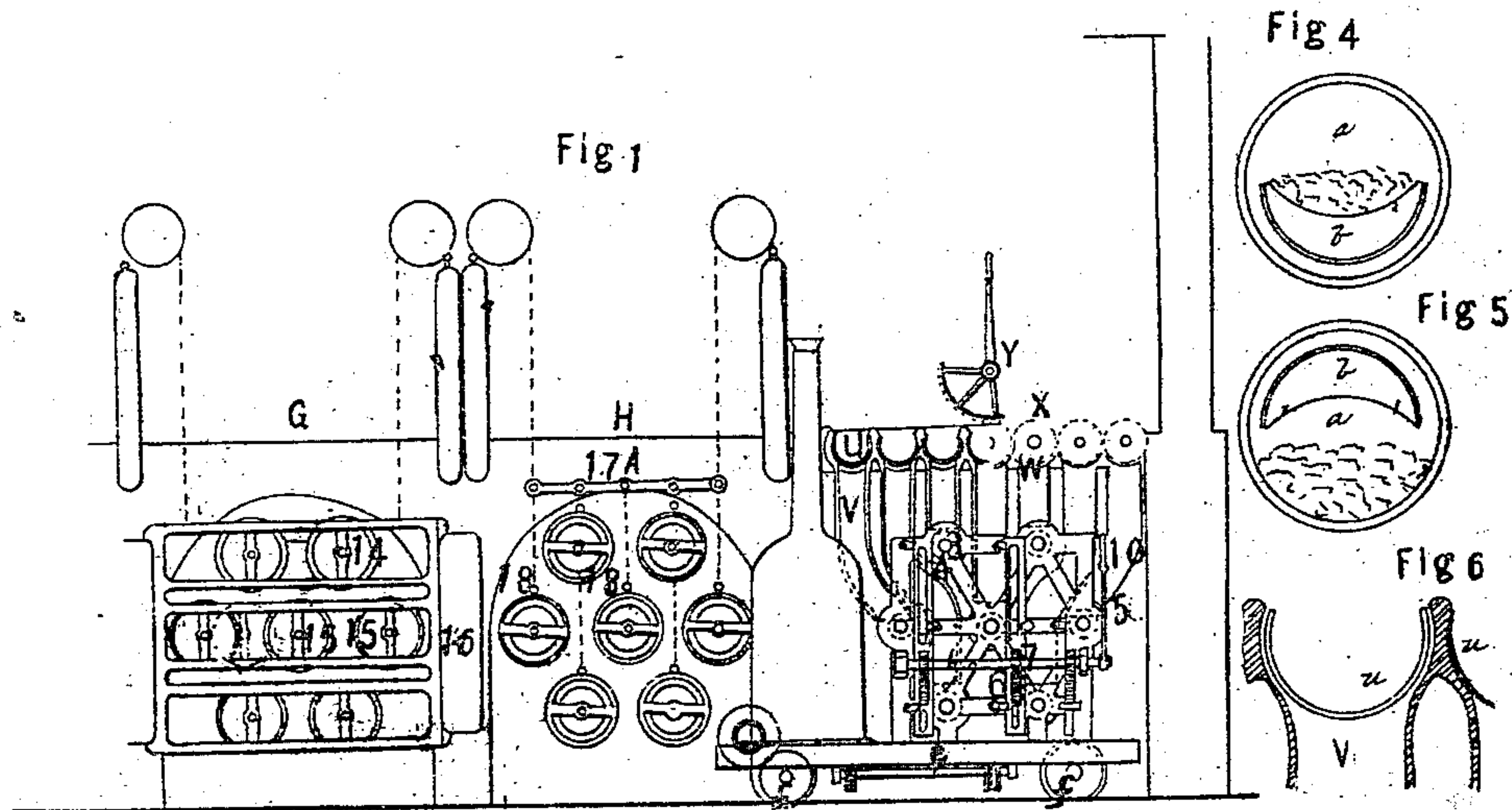


# Best & Holden. Gas Retorts.

5 Sheets.  
Sheet A.

No 61,144.

Patented Jan. 15. 1867.



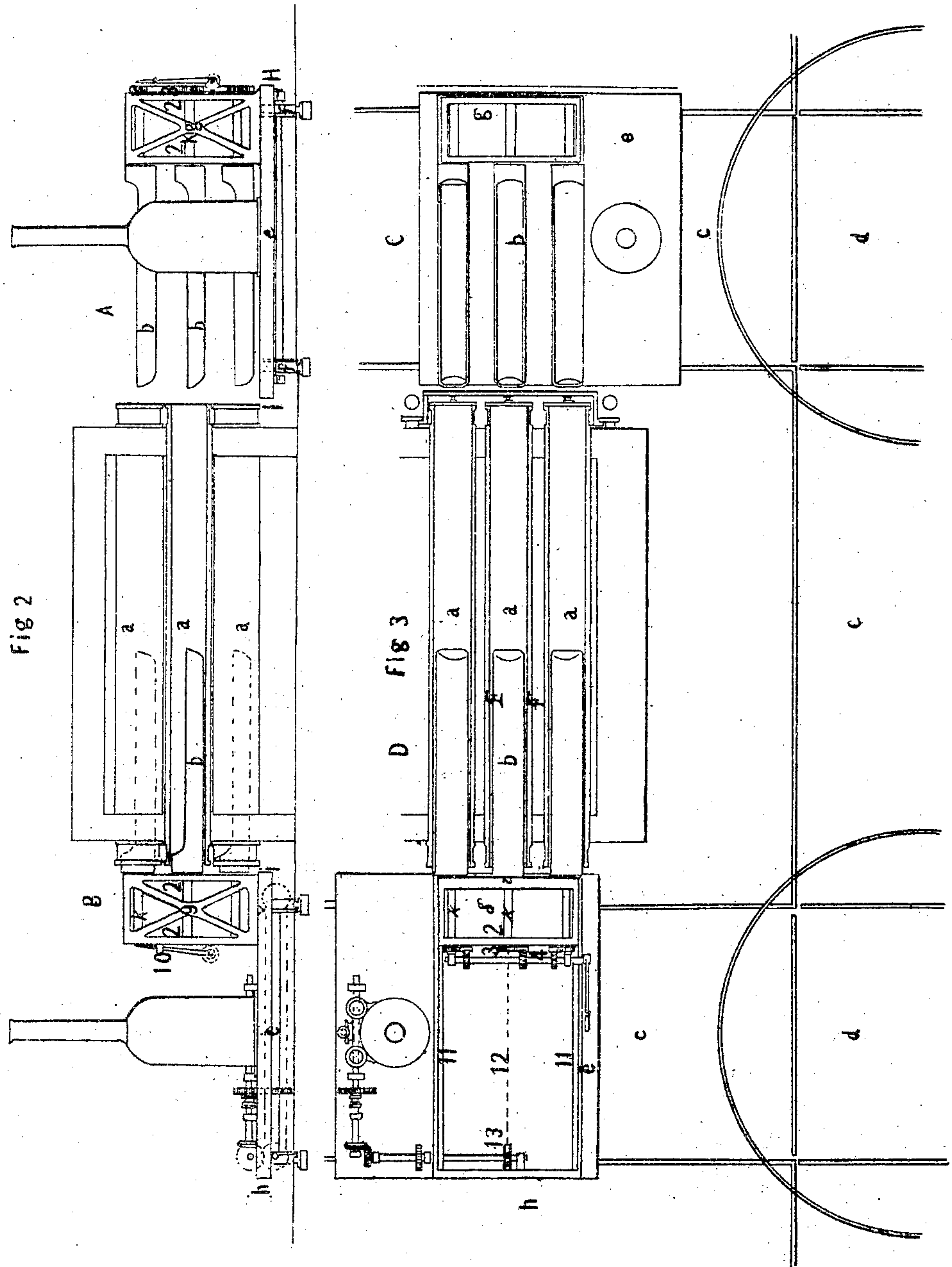
Inventors  
James Best  
James Allen Holden

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*S. Sheets.*  
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*No 61,144.*

*Patented Jan 15. 1867.*



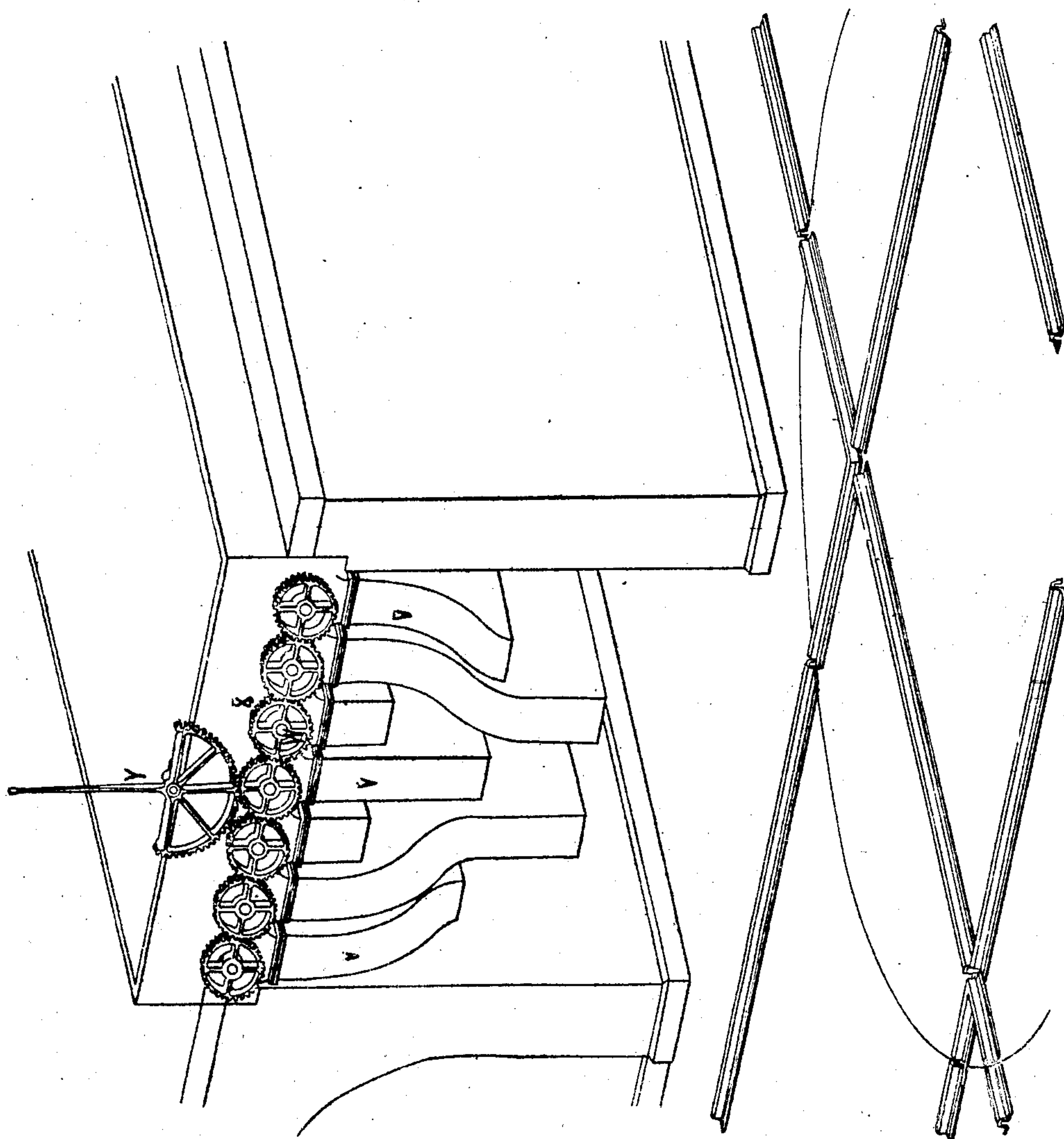
*Inventors*  
*James B. &*  
*James W. Holden*

*Best & Holden.*  
*Gas Retorts.*

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*No 61,144.*

*Patented Jan. 15. 1867.*



*Inventor*  
*James Best*  
*James John James Holden*

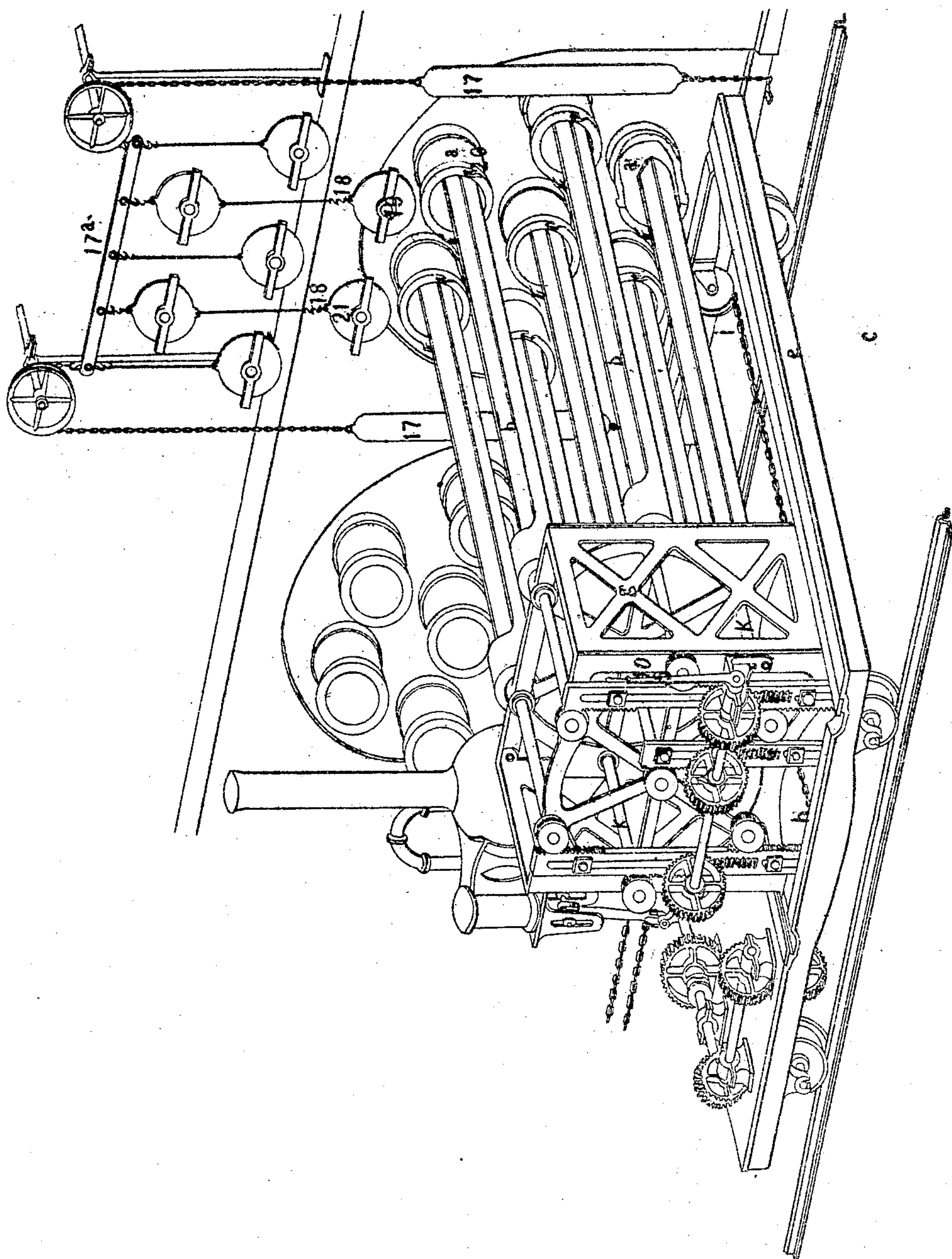


*Best & Holden.*  
*Gas Retorts.*

*5. Sheets*  
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*No 61,144.*

*Patented Jan. 15. 1867.*



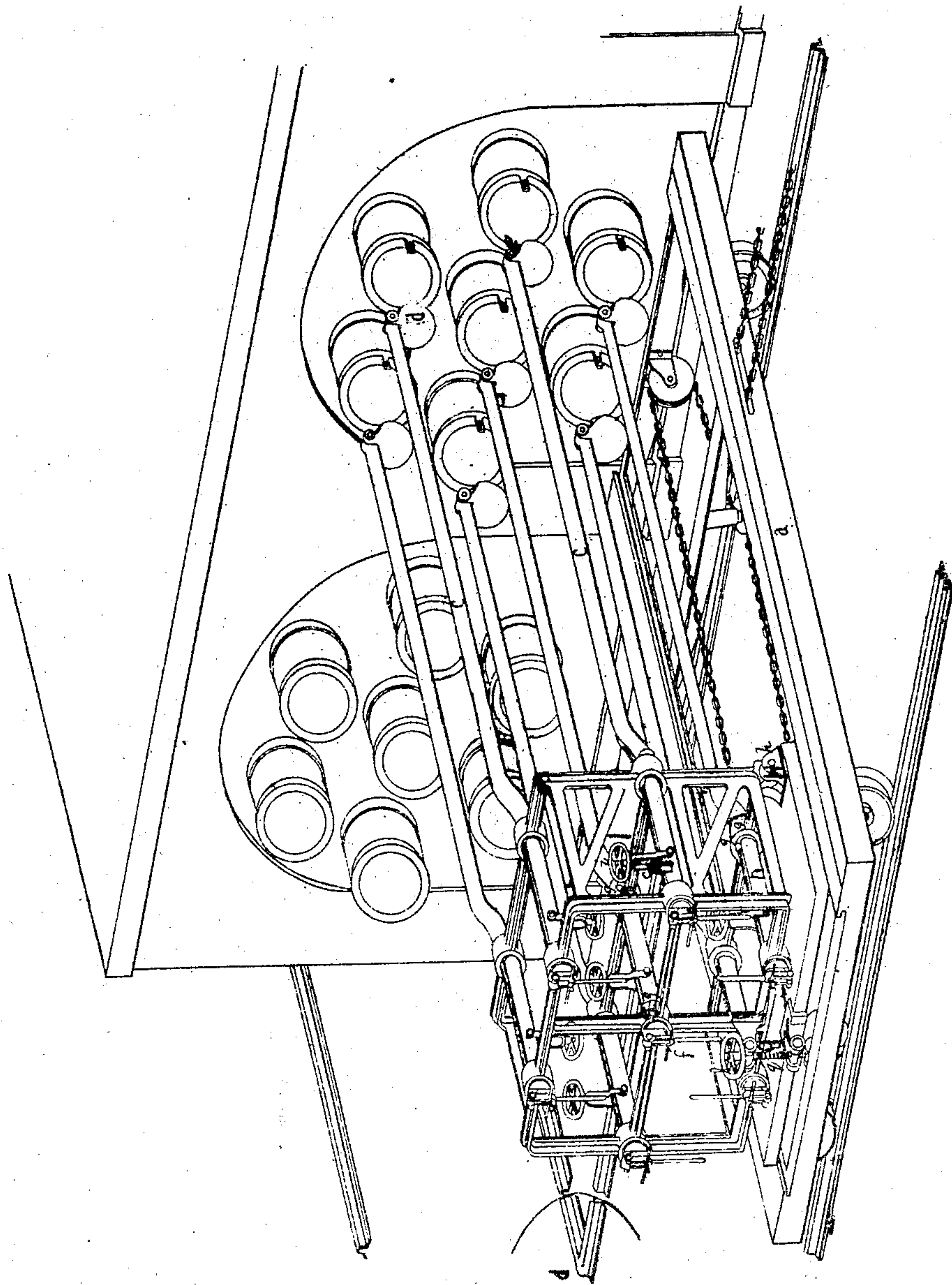
*Inventor*  
*James Holden*  
*James Holden*

*Best & Holden.*  
*Gas Retorts.*

*3. Sheets*  
*Sheet B.*

*No 61,144 -*

*Patented Jan 15. 1867.*



*Inventor*

*James Best*

*Amos John Holden*



# United States Patent Office.

SEALY JAMES BEST AND JAMES JOHN HOLDEN, OF LONDON, ENGLAND.

Letters Patent No. 61,144, dated January 15, 1867.

## IMPROVED APPARATUS FOR CHARGING AND DRAWING GAS RETORTS, AND OTHER LIKE PURPOSES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that we, SEALY JAMES BEST, of 193 Bermondsey street, in the county of Surrey, and JAMES JOHN HOLDEN, of 6 Single street, Bow, in the county of Middlesex, both in the United Kingdom of Great Britain, have invented a new and useful Machine or Apparatus for Charging and Drawing Gas Retorts, and for other like purposes.

Our invention relates more particularly to the manufacture of coal gas, and consists of apparatus or machinery for economizing the labor and cost of, and time occupied in, charging the retorts with coal and withdrawing the coke therefrom. With this apparatus or machines all the retorts in one oven or set can be charged by one operation, and the coke withdrawn therefrom also at one operation. And we do hereby declare that the following is a full, clear, and exact description of the same, reference being made, first, to the accompanying geometrical scale drawings A and B, making parts of this specification, and showing the apparatus and machines by plan section and elevation; and secondly, to the accompanying drawings, C, D, and E, upon which the machines are shown in model form, those parts of the apparatus which appear upon all the drawings being lettered with similar letters.

The forms and modes of constructing the said machines are thus fully illustrated upon the accompanying drawings, and explained in the following reference applying thereto, and the mode of using the same is hereinafter fully described.

### *Explanation of the Drawings.*

Figure 1 shows a front view of two sets of gas retorts, and the charging apparatus applied thereto, and also shows the feeding stage for supplying the charging-scoops with coals.

Figure 2 is a transverse section through the centre of the retorts, and shows the two side elevations of the charging-apparatus. At A the latter is shown in position for entering the retorts, and at B as inserted therein.

Figure 3 is a plan of the retorts at the horizontal centre line thereof, and shows the charging apparatus; also in plan (over all) the position of the apparatus at C corresponds with that shown at A, fig. 1, and at D, as shown at B, fig. 1, with the charging-scoop inserted in the retorts, and turned bottom upwards, in which reversed position (the coals being deposited in the retorts) the scoops are withdrawn. The following reference applies to each of these figures where the respective index letters and figures appear: *a* the retorts, *b* the charging-scoops.

Figure 4 shows the form of the scoops in transverse section at E F, fig. 3, as charged and inserted in a retort; and

Figure 5, the same scoop reversed, and the coals deposited. The curved line 1, 1 shows the form of the lip or end of the scoop, which is partly cut away or made hollow, so that it may pass over without touching the deposited coals as the discharge-scoop is withdrawn.

*c c c* are railways or tramways, along which the charging and drawing apparatuses are propelled, in which *d d* are turn-tables; *e* is a horizontal platform frame of angle iron, mounted upon the travelling-wheels *f*; *g* is a vertical frame working in slides in the horizontal frame, across which it has a traversing motion from *p* to *i*, and *vice versa*; *k* the shafts of the scoops, which, together therewith, turn in bearings 2 and in the small-toothed wheels 3 in vertical frame. These wheels rotate upon short axes or shafts, which are each traversed by a square hole to receive the ends of the scoop-shafts, which shafts each terminate with a screw fastened with a nut in front. By slacking one or more of these nuts, one or more of the scoops can be readily detached, when required. 4 are vertical racks, which gear or couple or engage with the toothed wheels 3, and are raised and lowered (and thereby reverse the position of the scoops) by the lever 5, shaft 6, and rack and pinion (or wheel and chain) motion 7 and 8. The end of the lever is held secure in its vertical position by a notch at 10, and thus prevents the scoops and coals from turning over until the lever is moved. 11 11 are two strong side grooves, planed true to receive two rails or tongues which are fixed to the bottom of the vertical frame, and upon which it slides and is supported. 12 is an endless chain, attached to and by which the sliding-frame is moved backwards and forwards. This chain is driven by turning the wheel 13. The entire apparatus can be moved and worked by hand, if required; but we propose to fit it with a small engine, and connect the engine-shaft by common wheel-work with the axle or axles of the travelling-wheels and with the endless-chain wheels, so as to both move and work the machine thereby; the engine, &c., being similar to that here shown, or of any other form and arrangement suitable for the purpose. In order to facilitate the operation of this machine and that of the drawing machine hereinafter described, and which forms a part of the apparatus, we propose, in the erection of new gas-works, or in putting in new retorts, to form the latter in the shape of truncated cones, the mouth at each end being slightly larger than the centre; and, in order to facilitate the opening and closing



of these and the ordinary retorts, we propose to fit the covers in frames, or suspend them, so that the whole of the covers to one set of retorts could be raised and lowered, and the retorts opened and closed simultaneously or singly. The mode of accomplishing this is shown at fig. 1. At G (drawing A) the covers are fitted to the sliding upright bars 14, slacked from and tightened against the mouth of the retort by the screws 15 in the centre. The centre cover is here shown as removed to one side. All the covers being movable, in this way, each retort can be opened, charged, and closed singly by keeping the covers in their normal position; and, raising the frame bodily, the whole of the retorts can be opened or closed at one operation. 16 are strong side-plates, behind which the main frame slides; 17, balance weights. The covers at H are balanced in a similar way, and all rise together, or can be each raised and removed singly. These covers are suspended from the cross-bar 17\* by chains, having each a draw-pin, 18; which pin, when taken out, releases the cover from the set. 19 is a revolving bar, the two ends of which are wedge-shaped, and when turned, slide in behind notches in projecting pieces 20 at the side of the retort flange. 21 are centre-screws, for further tightening the covers against the retort mouth. For supplying the charging-scoops quickly and respectively with the required quantity of coals, we propose to construct a charging-stage or stages, having a number of grooved openings or perforations to correspond with the number of scoops. These openings or perforations form troughs or holders for gauging the required quantity of coal. The bottoms of these troughs are each movable, being made to open downwards by tipping, dropping, sliding, or turning upon an axis, and are each fitted with tubes or conduits for conducting and discharging the coals into the charging-scoops, the latter being placed under them for that purpose. One of these charging-stages, fitted with tipping-scoops, is shown partly in elevation and partly in section at fig. 1. *u* are the scoops, which are filled with coals from the coal heap; *v*, the tubes or conduits; *w*, short pins or centres in the ends of the scoops, upon which they turn over or tip; *x*, toothed wheels fixed thereto and engaging with each other; *y*, lever and wheel for tipping the scoops when filled. By placing these stages at the ends of the ranges of retorts, and in a line therewith, the charging-scoops are run under them by the traversing motion of the vertical frame, and each scoop can thus be instantly supplied with the exact quantity of coals required; which quantity can be gauged or regulated as before described, or by weighing or otherwise from the stage above.

An enlarged section of a tipping-scoop and stage bottom is shown at fig. 6.

The drawing machine consists of a number of hoes, rakes, or scrapers, the blades of which rise to a horizontal, and fall to a vertical, position on hinges. The arms or handles are mounted upon a horizontal and travelling platform frame, both frames being similar to those of the charging-machine, to, with, and by which the drawing machine can be attached, moved, and worked, or separately, and by hand. The arms of the drawing rakes or scrapers are hollow, and are traversed by a rod for raising the blades to a horizontal position, so as to pass above the coke as they enter the retorts, and to lower them to a vertical position behind the coke as they are withdrawn from the retorts. The arms are formed with joints in the vertical frame, so that the ends which carry the blades can also be raised and lowered, as required. They are, further, so mounted and fitted that both arms and blades can be made to turn upon their horizontal axes by rack and pinion motion, similar to those before described in reference to the charging-machine.

Figure 7 is a side elevation.

Figure 8 is a front view.

Figure 9, a plan view; and

Figure 10, a back or end view of this part of the apparatus.

The reference letters and numbers apply to each figure.

*a*, the platform travelling frame; *b*, the vertical frame; *c*, the arms; *d*, the blades; *e*, blade hinges or joints; *f*, rods for raising and lowering the blades; *g h i*, joint lever and screw for raising and lowering the arms and blades. The object of this motion is to regulate the elevation of the arms and bring down the same together with the hoes or blades, so as to thoroughly clear out the coke and retort bottoms. *k*, split or hollow shafts, to which the arms are fitted; *l l*, bearings in the frames in which the shafts rotate; *m n o*, pinions, racks, and lever, for giving the rotary motion thereto; *p*, a transverse shaft and bearing, upon which the traversing frame can be inclined a little more or less vertically by the screw *q*, when required. The traversing frames shown upon the drawing are such as we should apply when the retorts are all fixed in the same relative positions. Where this is not the case, and the same apparatus is required to charge and draw sets of retorts, the elevations, relative positions, and number of which vary, the traversing frames are made with sliding and adjusting bearings, so that the shafts of the charging-scoops and arms of the drawing-rakes can be moved and set in their respective frames, both vertically and horizontally, as required. The drawing-rakes are secured by nuts and screws, so that one or more can be readily detached when necessary for drawing one, two, or more retorts thereby only. The rods *f*, by which the blades are raised and lowered, have notches or pin-holes at *f'*, to secure them in the required position for holding the blades up or down, and can be fitted with levers or screws at the ends to lower them when more than the simple hand power is required. The arms, however, are made of sufficient length to carry the blades beyond the coke, so that, generally, they will fall of themselves when the ends of the draw-rods are released.

#### Claim.

We claim the apparatus and machinery substantially as herein described.

SEALY JAMES BEST,  
JAMES JOHN HOLDEN.

#### Witnesses:

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