

(No Model.)

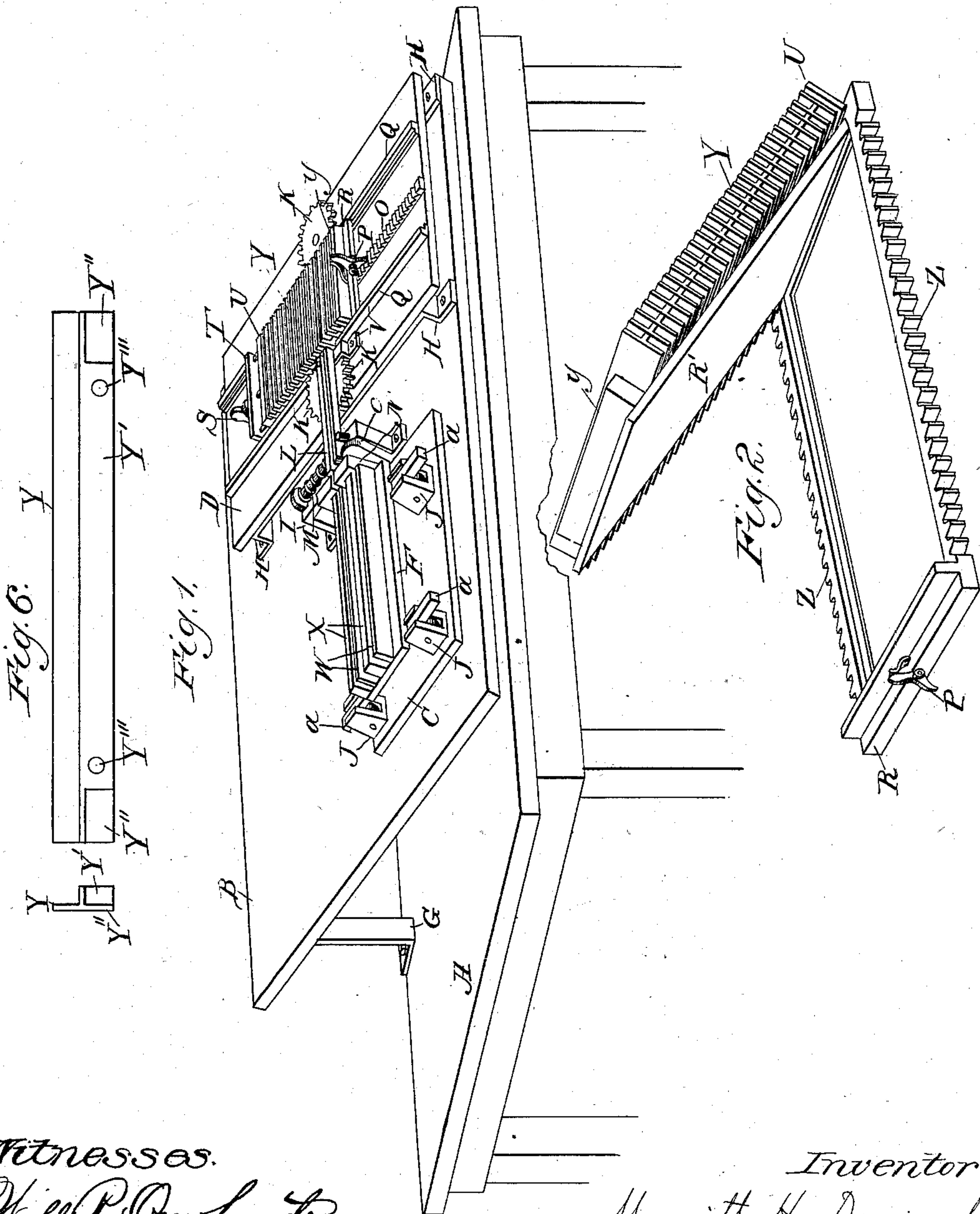
4 Sheets—Sheet 1.

M. H. DEMENT.

APPARATUS FOR JUSTIFYING STEREOTYPED LINE STRIPS AND PUTTING
AND SECURING THEM IN COLUMN OR PAGE FORM.

No. 282,176.

Patented July 31, 1883.



Witnesses.

Will R. Oroschmidt.

Columbus Smith.

Inventor

Merritt H. Dement.

(No Model.)

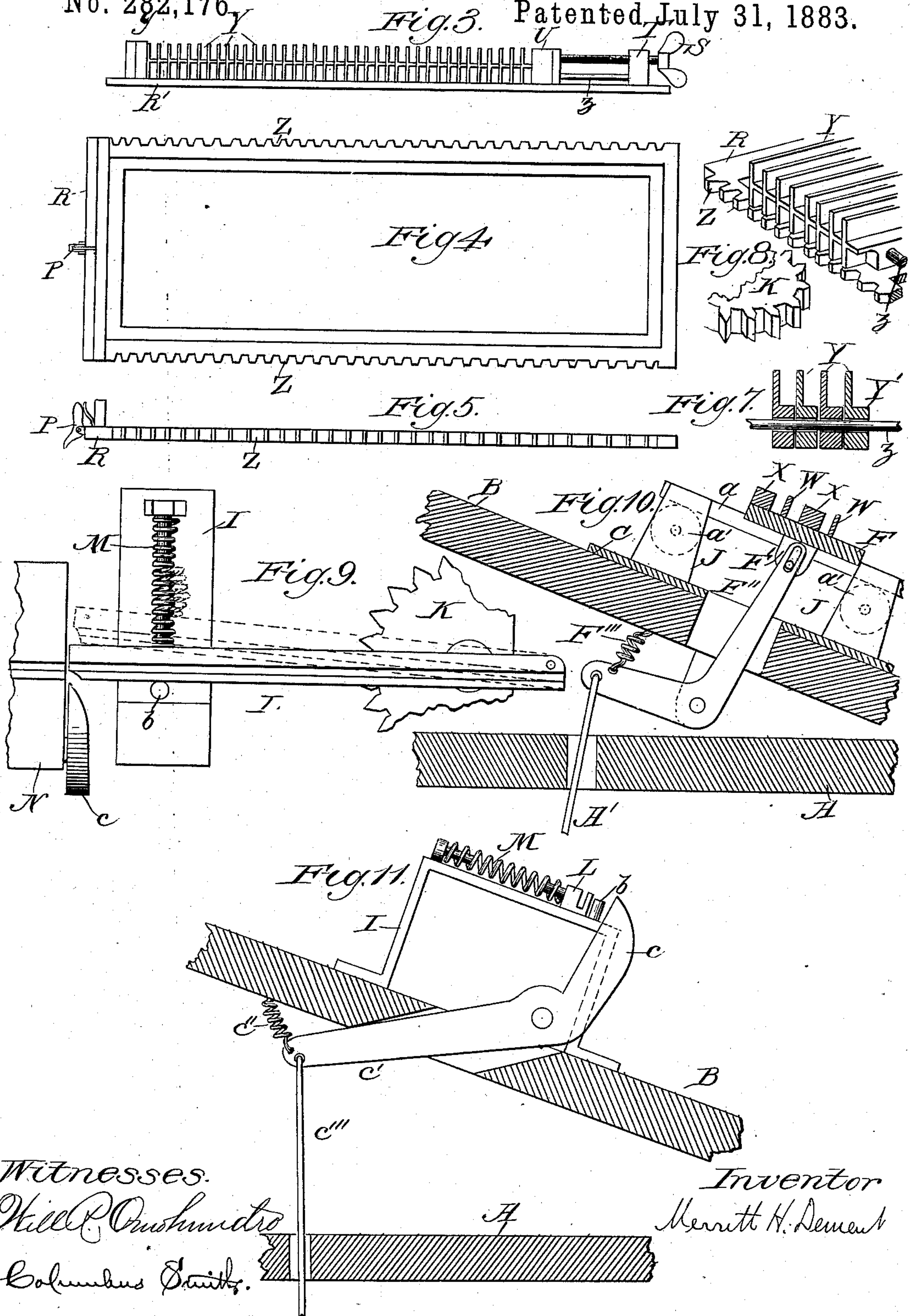
4 Sheets—Sheet 2.

M. H. DEMENT.

APPARATUS FOR JUSTIFYING STEREOTYPED LINE STRIPS AND PUTTING
AND SECURING THEM IN COLUMN OR PAGE FORM.

No. 282,176

Patented July 31, 1883.



Witnesses.

Will C. Crummett

Columbus Smith.

Inventor
Merritt H. Dement

(No Model.)

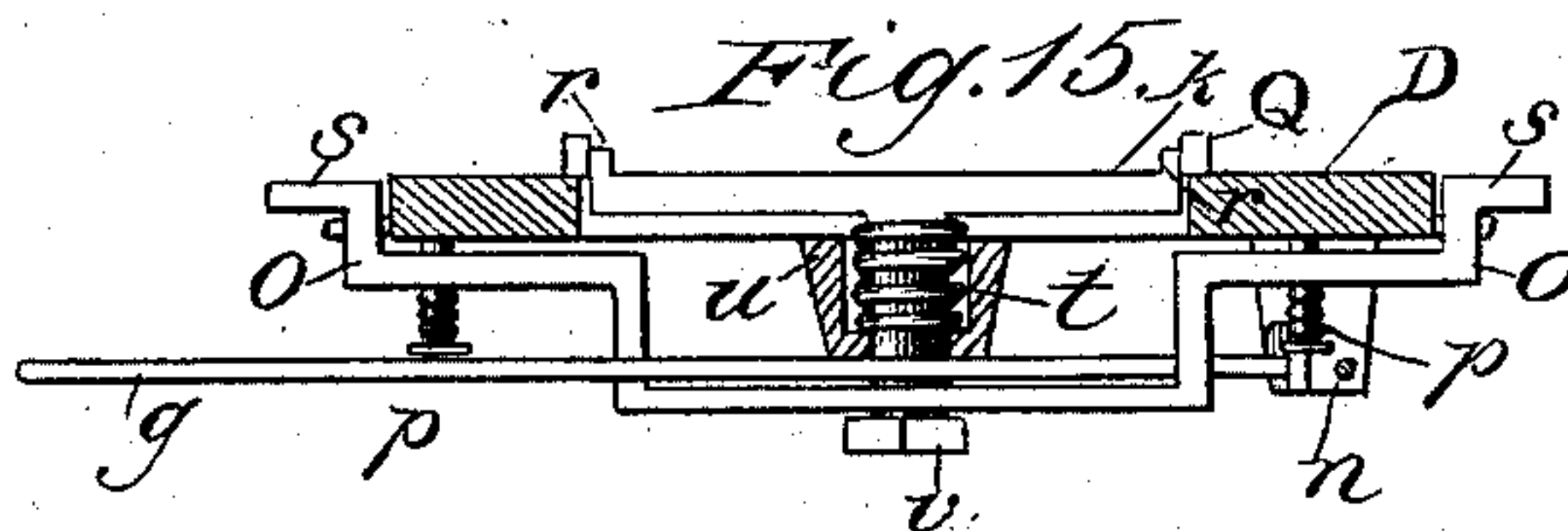
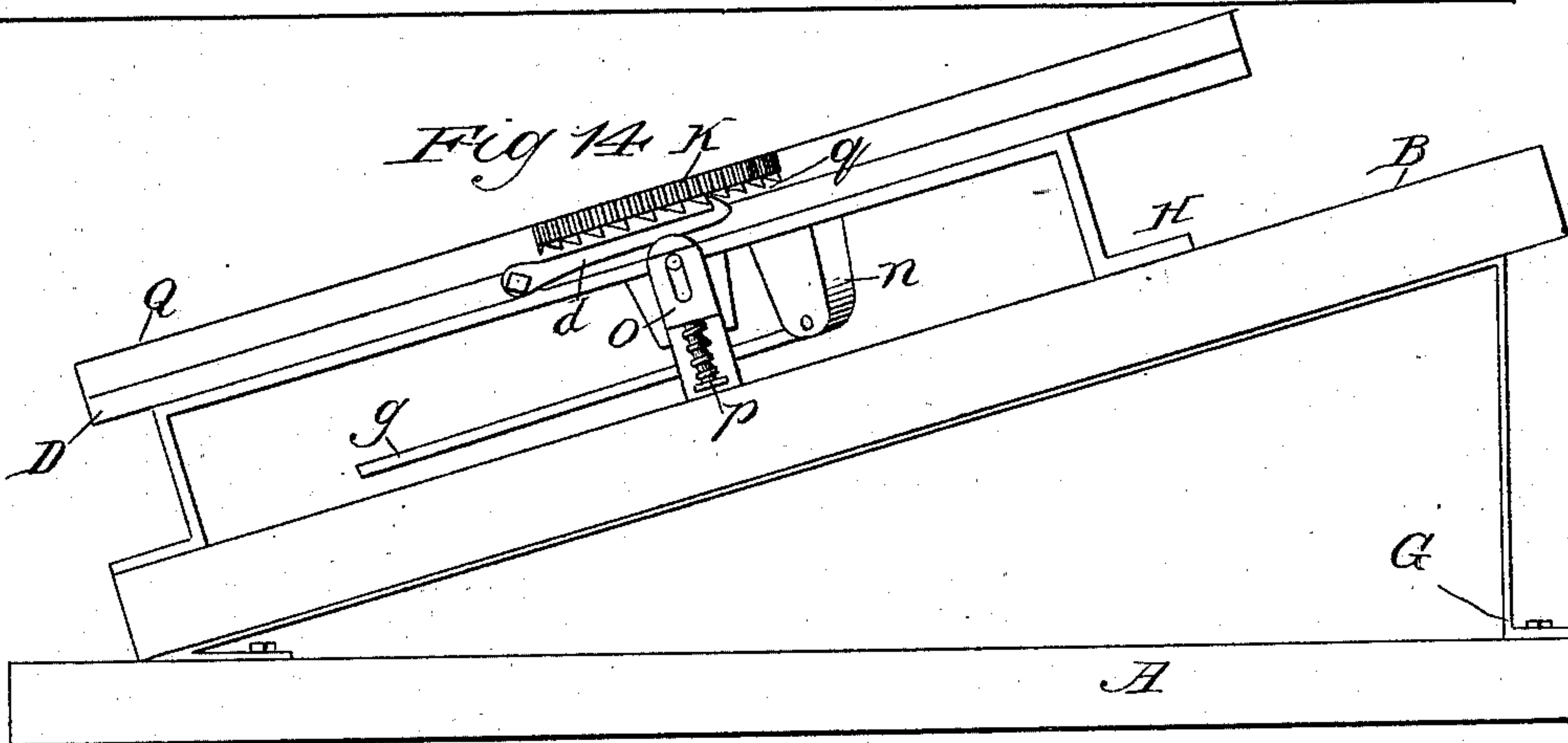
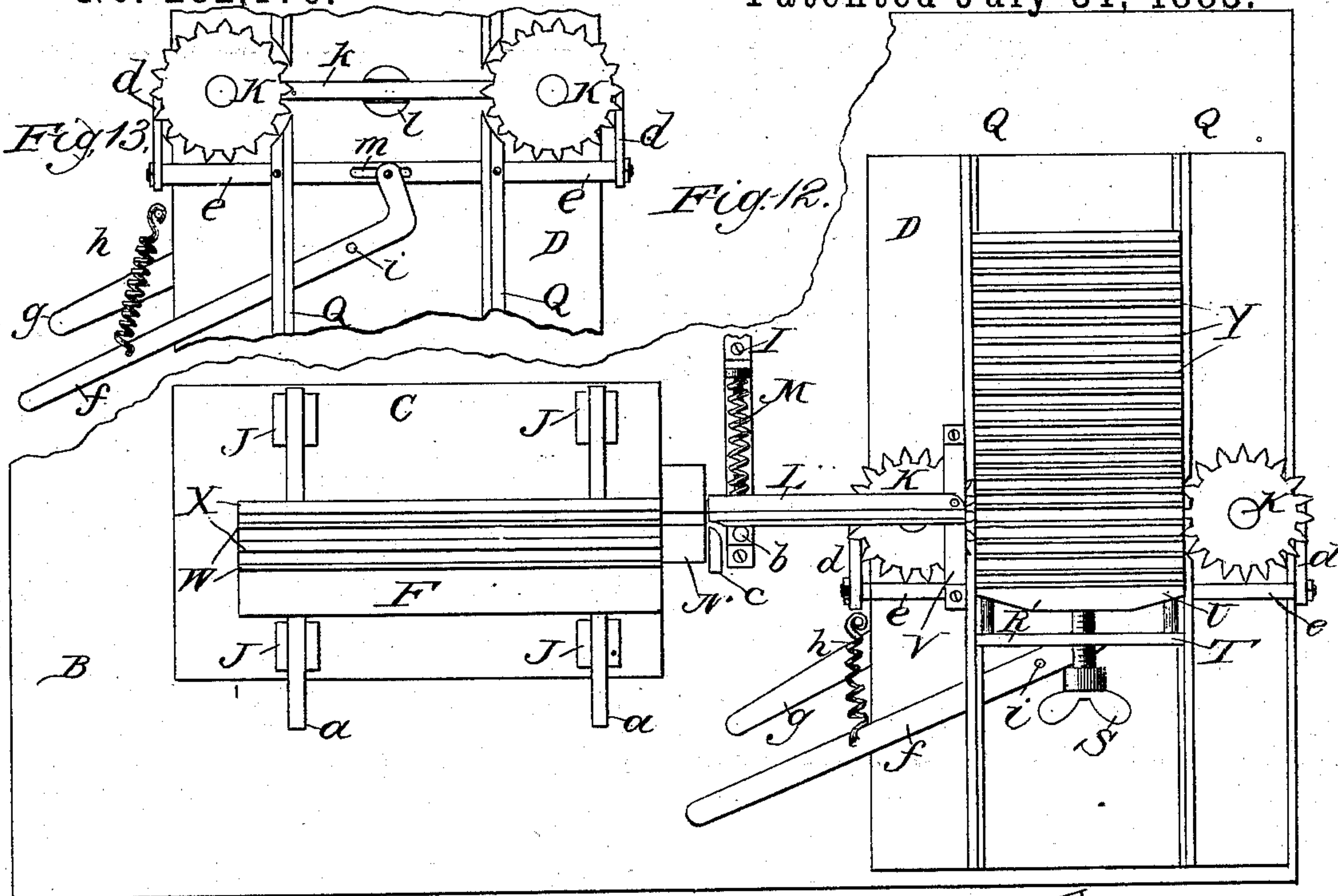
M. H. DEMENT.

4 Sheets—Sheet 3.

APPARATUS FOR JUSTIFYING STEREOTYPED LINE STRIPS AND PUTTING
AND SECURING THEM IN COLUMN OR PAGE FORM.

No. 282,176.

Patented July 31, 1883.



Witnesses.

Will R. Oushindro.
Columbus Smith.

Inventor
Merritt H. Dement

M. H. DEMENT.

APPARATUS FOR JUSTIFYING STEREOTYPED LINE STRIPS AND PUTTING
AND SECURING THEM IN COLUMN OR PAGE FORM.

No. 282,176.

Patented July 31, 1883.

Fig. 16.

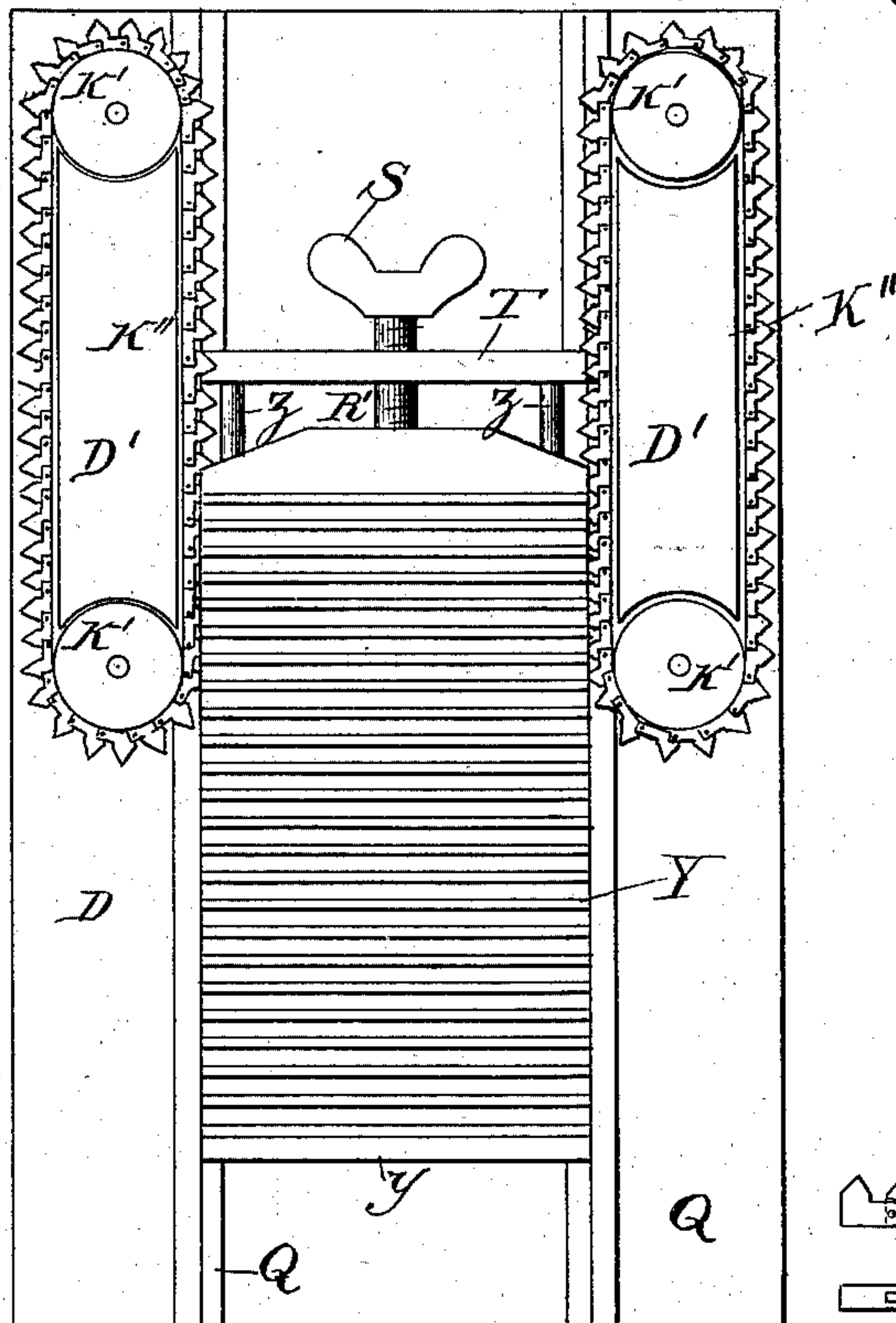


Fig. 18.

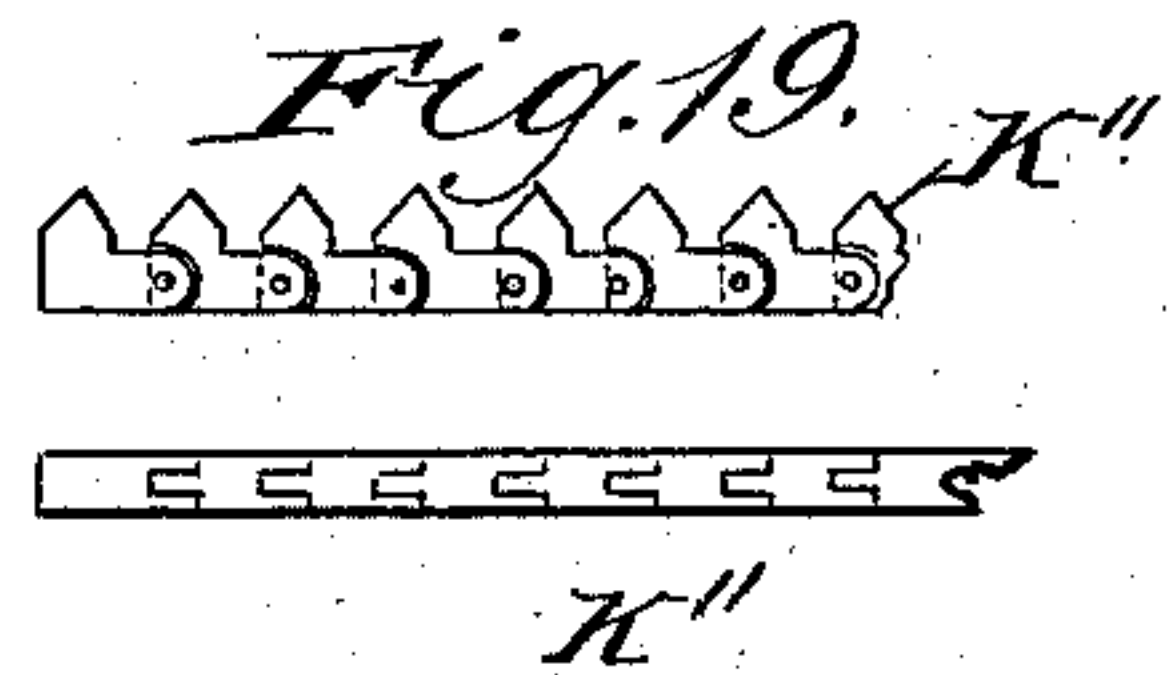
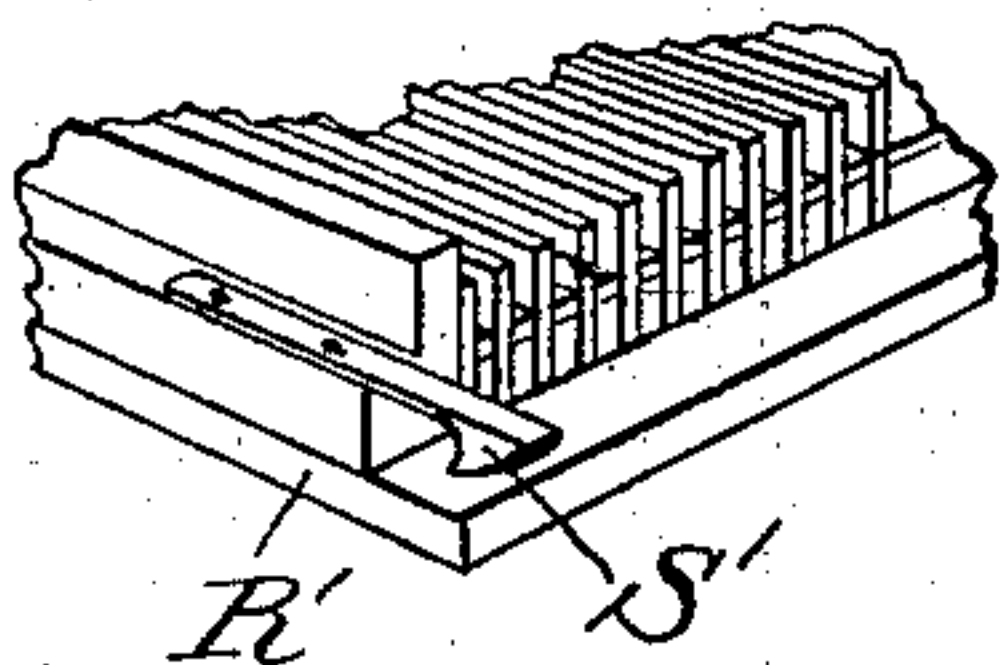
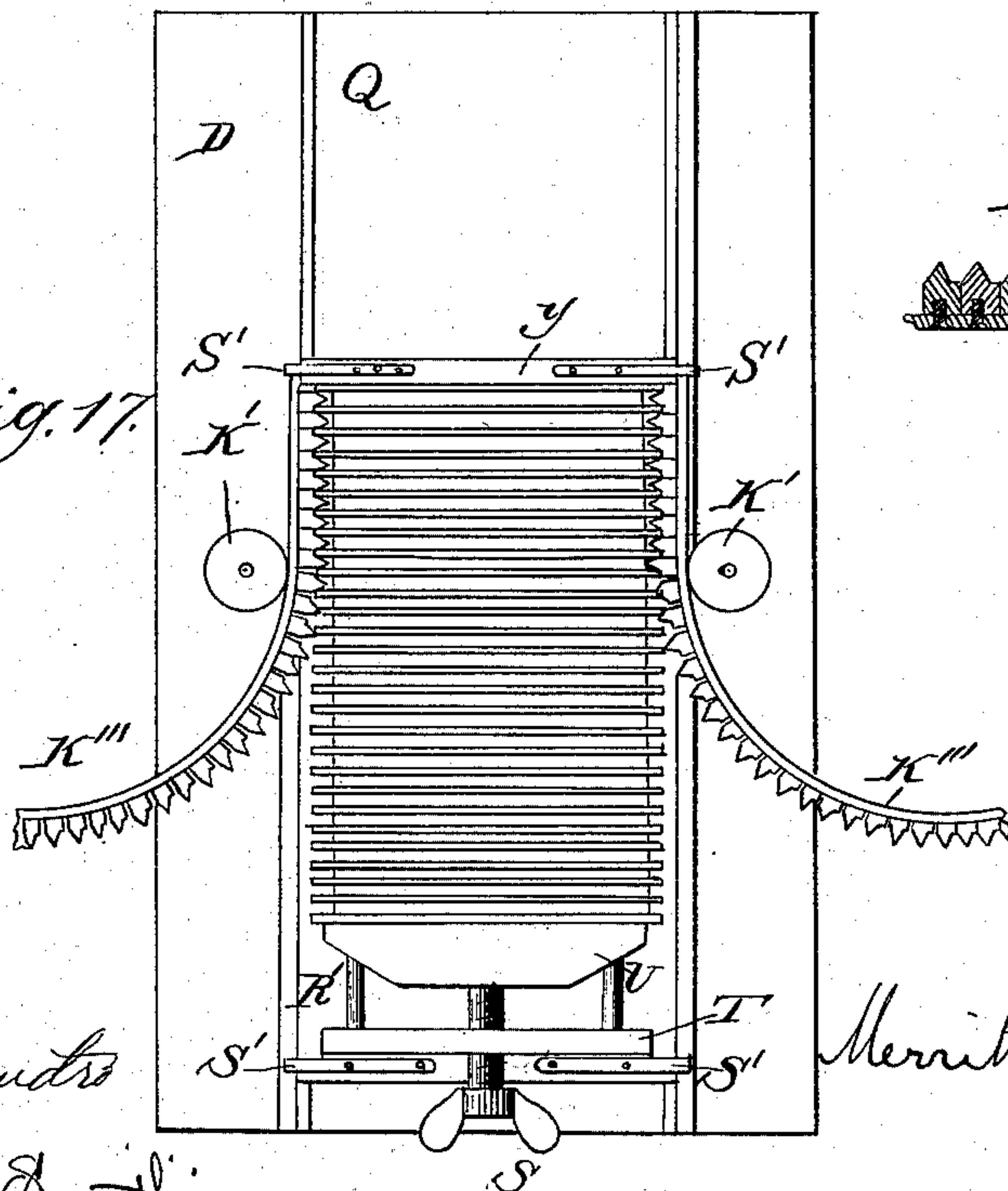


Fig. 20.



Fig. 17.



Witnesses.

Will R. Onshanks

Calvinus Smith.

Inventor

Merritt H. Dement

UNITED STATES PATENT OFFICE.

MERRITT H. DEMENT, OF CHICAGO, ILLINOIS.

APPARATUS FOR JUSTIFYING STEREOTYPED LINE-STRIPS AND PUTTING AND SECURING THEM IN COLUMN OR PAGE FORM.

SPECIFICATION forming part of Letters Patent No. 282,176, dated July 31, 1883.

Application filed May 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, MERRITT H. DEMENT, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Printers' Chases or Justifying Apparatuses, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, which are made a part hereof.

My improvement relates to the art of printing, and more especially to that branch of the art wherein type-indentations are made in strips, which are afterward stereotyped; and it consists in the devices and combinations as hereinafter described, and specifically pointed out in the claims.

In former applications I have described machines for making type-indentations in strips of paper or other material, and also an apparatus for casting type-bars from such strips, the bars, when thus cast, being provided with a shelf at the type-edge, making them wider at that edge than at the other, and permitting supports to be placed between them without spreading them apart. In the present application the type-bars are shown with this widened type-edge; but the use of the apparatus herein described is not limited to that particular kind of type-bar, as it may be readily used with any other kind of bar.

The mechanism for holding the bar which is being justified and the correction-bar consists of two parallel shelves, which are capable of sliding laterally, so as to bring either bar in position. The shelves are secured to a plate which rests upon two transverse bars, which in turn slide in slots cut in four posts secured to the table. To facilitate the action of sliding, a small wheel, upon which the transverse bar rides, is journaled in the lower portion of each slot. The plate is so arranged that the posts serve as guides in its shifting movement. When it rests against the two upper posts the lower type-bar (which is the correction-bar) will be in position to be run out and broken, and when it rests against the two lower posts the upper type-bar will be in position.

The shifting is accomplished by means of a bell-crank lever, the upper end of the perpendicular arm connecting with a pin secured to

a shoulder on the under side of the plate, and the horizontal arm connecting by a chain or bar with a pedal. By depressing the pedal the lever throws the plate forward against the two upper posts and brings the lower type-bar in position. A spring secured to the table and connecting with the horizontal lever-arm, serves, when the pedal is released, to throw the plate back against the two lower posts, when the upper type-bar will be in position.

To the right of the plate is placed a fixed block, having cut transversely through its upper surface a groove corresponding in shape and size to the type-bar, which block serves to hold the type-bar in position while it is being cut or broken, one side of the groove operating as one arm of a pair of scissors, the knife serving as the other. The knife is secured by a strong bolt to the side of the block, a horizontal arm, extending under the table, being connected with a second pedal, so that when the pedal is depressed the knife is brought against the type-bar with sufficient force to break or cut the bar. The type-bar is slid by the operator's fingers into position to have the bar broken at the desired point.

To hold the piece or pieces of type-bar which may be broken off, a plate with a single shelf, similar in form to the shelves already described, is placed to the right of the block, one end resting upon a support secured to the table and the other being pivoted to the chase-frame. The end next the knife is made capable of moving with the knife as the momentum of the latter carries it past the cutting-point. A spring resting against a shoulder on the upper end of the support serves to crowd the shelf back against a pin at the lower end of the support, which pin is so situated that the shelf will then be in position. Inasmuch as there will frequently be cut a piece of type-bar as long as a line, this shelf should be long enough to hold it without its protruding into the chase, as the momentum of the knife in the act of breaking might bend the end of the type-bar, which would protrude into the chase.

The chase or justifying-form consists of a series of adjustable or movable bars, between which the type-bars are run in lines, and which

serve as supports therefor. These supports may be secured in a variety of ways. I prefer to arrange them as shown—viz., by making them sufficiently high to admit of their being strung upon two parallel rods (or their equivalent) which penetrate them underneath the type-bars, and upon which they are arranged to slide so as to permit their being separated sufficiently to allow the type-bars to be readily slid between them, to permit their being tightly pressed together, so as to hold the type-bars rigidly in place while being handled or printed from, and also to permit their being then spread apart, so that the type-bars may be readily removed after use.

The parallel bars upon which the supports ride rest at each end in a fixed block, which blocks are secured to a base-plate. Upon the parallel bars, at one end of the plate and inside of and next to one of the fixed blocks, is placed a movable block, in which the end of a screw which works in a worm in the fixed block at that end is secured, and by means of which screw the supports are pressed together or loosened, as the case may be.

The forward side of the upper half of each support is cut away or recessed slightly less than the thickness of the type-bars, so that when the type-bar is run in it will slightly overhang the lower half of the support, and when the supports are compressed the pressure will come upon the type-bars, instead of the lower or wide half of the support, and the bars thus be held rigidly in place. The widened edge at the top of the bars will extend over and cover the narrowed edge at the top and rear side of the support.

For the purpose of admitting cams or cogs to hold the supports apart while the type-bars are being put in place, the lower portion of each support at the ends is also recessed or cut away for a short distance. The remaining portion of the lower half of the supports, in the center thereof longitudinally, which is left wide, serves to hold the supports apart sufficiently to admit the cogs; or the supports may consist of bars narrower than the type-bars, or of the same thickness as the shelf on the type-bars, with means for holding them sufficiently apart to permit the ready entrance of the cams for pressing them into position. In this form the type-bars would rest upon the tops of the supports, instead of upon the chair-seats, as described elsewhere.

The mechanism thus described is secured to a board or platform, the front side of which rests upon the front side of a table, the rear side being elevated at an angle of about thirty degrees, as a matter of convenience to the operator.

The means which I have invented to bring the supports in position, one after the other, and to hold them apart so that the type-bars may be readily run in, constitute one of the principal features of my improvement.

It will be seen that it is necessary to have

the supports come and remain rigidly in position, one after the other, at the right of the shelf which receives the type-bars after they are cut, so that the bars may be run in; also, to have the support next forward kept at such distance that there will be room to readily run the type-bars in place; also, means for moving up the chase, line by line, as the lines are filled; also, to release the chase so that it may be moved backward in case of making corrections; also, means for compressing the bars and supports together, so that the bars may not be displaced in handling or printing, and means for relieving the pressure so that the bars may be readily removed after use.

I accomplish some of these objects by the use, in combination with the movable or adjustable supports, of a series of adjustable cogs or cams which serve to spread the supports apart an uniform distance and to hold them rigidly in position, and which may be readily removed so that the supports may be compressed. These cogs or cams may be applied in various forms—for instance, in the form of cog-wheels or cam-chains, or a series of cams secured to a flexible strip.

In the first form the chase should be made to ride upon a carriage or rack which slides in grooves formed on the inner sides of parallel ridges on a cast-iron plate. This carriage or rack consists of a square frame fitted to the grooves at the sides, and provided with supports or guides at the lower end against which the chase is placed. Two wheels are journaled, one on each side of the chase, and provided on their peripheries with cogs of a length to press the supports the proper distance, and with spaces between the cogs formed to receive the narrowed ends of the lower portion of the supports, and thus hold them rigidly in position. The wheels are so placed that as they revolve, the cogs, as they come on the operating side of the wheels, will press in between the supports the proper distance to hold two or more of them at a time—for instance, to hold the support to be used rigidly in position, and to hold the preceding one out of the way, the succeeding cogs catching between the succeeding supports until all the lines are filled. The cogs should be beveled to a point, so that they will more readily catch between the supports, especially when the supports may be slightly out of position; and there should be square shoulders between the cogs, so as to hold the ends of the supports more firmly. The rack is provided with cogs on the sides to receive the cogs on the wheels or flexible strip or chain, the cam-wheels being made sufficiently thick to operate upon both the supports and the cog-rack at once. This insures uniformity of action of the cog-wheels.

The plate which forms the base of the chase may be cut away at the sides, so as to be embedded in the cog-rack, and permit the lower portions of the ends of the supports to rest upon the sides of the cog-rack, the cogs in the wheel corresponding in size and relative po-

sition with the cogs in the cog-rack. Thus the lower portion of the cog-wheel will operate in the cogs in the carriage, and the upper portion will operate upon the supports, and force them into position; or the wheel may be formed of two parts, the lower portion operating in the cog-rack, and the upper portion upon the supports. The ends of the supports should project over the cogs in the cog-rack sufficiently to permit the ends of the supports to be caught by the square openings or shoulders between the cogs, while the cogs in the rack need penetrate no deeper than is necessary to operate upon the cogs on the wheels.

The cog-rack may be moved forward by the hand of the operator. The movement may be regulated in any suitable manner. I prefer to have a series of notches upon a bar fixed longitudinally in the center of the bottom plate, and to attach to the end of the cog-rack a simple drop-catch, with a spring pressing the catch down and pressing the lower end into the notches successively. The notches should be so regulated that they will correspond with the supports as they are operated upon by the cogs; or, in other words, so that each notch will hold the rack at the proper place to bring a support into position to receive the type-bar. To do this they should correspond in distance apart with the cogs on the wheels, so that as the rack is advanced one notch, a cog brings the next support in position.

The object of connecting the rack with the cog-wheels is to provide a means by which the latter will move in unison, and by which they may force the chase forward. If the wheels operated simply upon the supports they might not always act in unison, and one end of a line or support might not be even with the other. The wheels may also be made to move in unison by intermeshing-gears beneath the wheels, one on the shaft of each wheel. A rack is also used in connection with the chase, because a number of chases are required, and by having the rack provided with the cogs, and also with a drop-catch, it saves making each chase with those appliances. Besides, a single rack can be more easily adapted to move readily and freely in the grooves, than could a number of chases.

The cog-wheels may be used in a slightly different form, and perhaps with equally good results, although the mechanism is somewhat more complicated. In this form, on the under side of each wheel, in a circle, are placed a series of cogs corresponding in number and location with the cams. Operating in connection with these cogs are two catches, one for each wheel, which serve as stops, and are so situated that when they catch in the cogs the cogs then operating between the supports will hold them in position for running the type-bars in. These catches are formed upon the bent ends of a bar which lies in a lateral horizontal position under the chase, and which is pressed upward so as to hold the catches against

the cogs by means of a coil-spring resting in a socket in the casting underneath the chase. A bolt passing through the coil-spring and socket is secured underneath the socket by means of a nut or pin.

The chase is moved upward line by line by means of catch-levers or pawls, one operating in the cogs in the under side of the outer rim of each wheel. By pulling backward or downward on the outer rims of the wheels these levers or pawls give a corresponding forward or upward movement to the inner rims of the wheels, and the chase is thus moved forward or upward. These catch-levers or pawls are held against the cogs by any suitable spring device, the one shown being a bar similar to the one above described for the stops or catches, with bent ends which are caused to press upward against the levers by means of coil-springs, one near each end of the bar, the lower portion of each spring resting against the head of a screw or spring suspended from the under side of the cast-iron frame, and the upper portion pressing against the bar.

The catch-levers or pawls are pivoted to horizontal bars resting on the cast-iron frame and pivoted to it, the inner ends meeting and overlapping each other under the center of the chase, and being slotted so as to admit a pin to connect them with a hand-lever, which, when operated, presses the inner ends of the bars upward or forward, thus pulling the catch-levers backward, and turning the wheels one notch. The movement of the hand-lever is regulated by a stop, and it is returned to position by means of a spring, as shown.

For the purpose of releasing the four catches, and to permit a backward movement of the chase, the two horizontal bars which operate the catches, and which lie underneath the frame, are pressed down by means of a second lever, which overlies the two bars, and the inner end of which is pivoted to a support underneath; so that by pressing upon the outer end of the lever the two bars and the two inner catches are forced downward, while the two catch-levers or pawls are left free to fall of their own weight. The wheels are thus left free to move backward.

A further modification of my invention consists in another means of holding the supports in position and apart while the type-bars are put in place, and thus permitting the supports to be compressed when the chase is filled. This means consists of a series of cams upon a strip of flexible material or in a chain-form, which cams are forced *seriatim* in between the supports by passing the chase between two wheels, or by any suitable means, thus holding the supports in place and apart, and which strip or chain may be readily removed to permit the supports to be compressed. These cams should be similar in size and form to those described upon the cam-wheels. They may also be used in the form of two endless chains, between which the chase passes, rigid plates

on each side of the chase serving as a backing to the chains, to press and hold the cams in position, the chains at the ends passing around wheels, substantially as shown.

5 In the annexed drawings, Figure 1 is a perspective of the improved apparatus. Fig. 2 is a perspective of the chase and carriage or cog-rack, one end of the former being elevated. Fig. 3 is a side elevation of chase. Fig. 4 is a plan
10 view of the cog-rack or carriage. Fig. 5 is a side view of Fig. 4. Fig. 6 shows detail views of a line-support. Fig. 7 is a sectional view of part of Fig. 8, showing four supports and manner of arrangement on parallel rods z . Fig. 8
15 is a perspective of a portion of the chase and carriage, with cog-wheel K disconnected. Fig. 9 is a plan view of swinging receiving-shelf, support I, knife c , and a portion of block N and cog-wheel K. Fig. 10 is a sectional
20 view, showing arrangement of sliding shelves and mechanism for shifting the same. Fig. 11 is a sectional view, showing arrangement of knife and mechanism for operating same. Fig. 12 is a plan view of a modification of my invention, showing mechanism for operating the
25 cog-wheels. Fig. 13 is a plan view of a central portion of plate D, with chase removed. Fig. 14 is an end view of modification, showing side view of plate D. Fig. 15 is a sectional
30 view of plate D, showing operation of lever g in ungearing stops to permit the sliding back of the chase after being pushed past cog-wheels. Fig. 16 is a plan view of plate D, showing a modification of my improvement, with cams
35 in the form of endless chains. Fig. 17 is a plan view of plate D, showing a second modification thereof, with cams on flexible strips. Fig. 18 shows attachment of a spring for holding end of flexible strip. Fig. 19 shows de-
40 tailed views of cam-chain; and Fig. 20 is a sectional view of flexible strip with cams, showing manner of attachment.

A is the table; B, the board or plate upon which the apparatus is secured, the rear side
45 being elevated by means of supports G, to obviate the necessity of the operator's stooping.

C is the plate to which are secured the slotted posts or supports J, containing small wheels
50 $a' a'$, in which ride the bars a , which in turn support the plate F, which carries the shelves W W and guards X X. The guards X X serve to hold the type-bars from falling off the shelves W W.

55 N is the grooved block, which holds the type-bar while it is being cut or broken by the knife c .

L is the receiving-shelf, one end being pivoted to the plate V, the other resting and arranged to slide on the support I, the spring
60 M holding it when at rest in position against the pin b .

65 D is a cast-iron plate, secured to the plate B by supports H H, and provided with two parallel ridges, Q Q, grooved on the inner edges to receive the cog rack or carriage.

R' is the base-plate of the chase or justifying-form, on which are arranged the line-supports Y, secured to the base-plate R' by means
70 of two parallel rods, $z z$, which pass loosely through the supports, as shown in Figs. 7 and 8, and the ends of which rest in fixed blocks y and T, which are secured solidly to the base-plate. These supports are arranged to slide
75 on the parallel rods, the sliding being regulated by the screw S in the plate T, pressing against the movable plate U.

P is a spring-catch, which operates in the cogs O to hold the rack at any desired point
80 as the rack is moved forward or backward by the hand of the operator.

K K are the cog-wheels which operate in the cogs Z in the cog-rack R, and the cogs of which
85 serve as cams to press the line-supports Y into position.

Y Y represent the line-supports, Y' being the wide portion, which serves as a support
90 for the type-bars, and also to hold the support away from the next support, so as to admit the cogs to press them apart. Y'' is the opening, at the ends in which the cogs or cams operate. Y''' are holes to receive the parallel
95 supporting-rods z .

F' is a shoulder on the under side of the plate F, to which is secured a pin working in the slot
100 in the upper end of the bell-crank F''. A' is a rod connecting the bell-crank F'' with any ordinary pedal, (not shown,) the spring F''' serving to throw the bell-crank back to position when the pedal is released.

105 c'' is a rod connecting another pedal (not shown) with the arm c' , by means of which the knife is operated. The spring c'' serves to throw the knife back to position when the pedal is released.

In the modification the construction and operation is as follows:

110 k is a bar with arm extending downward in the socket u , and provided with nut v at the lower end, and having on its ends catches $r r$, which operate in the cogs q , on the under side of the wheels K K, to hold the wheels from a
115 backward motion. The spring t serves to press the catches $r r$ against the wheels K K.

120 $d d$ are catch-levers or pawls, pivoted on the ends of bars $e e$, which are in turn pivoted under the guides Q Q. The bars $e e$ are slotted at the inner ends to receive the pin on the upper end of the lever f . This lever is pivoted
125 at i , and held in resting position by a spring, h . By pulling backward on the outer end of the lever f the slotted ends of the bars $e e$ are pressed upward or forward and the outer ends and the catch-levers $d d$ are forced backward, thus causing a partial revolution of the cog-
130 wheels K K and the consequent forward movement of the chase to the next line. The bar o rests upon the springs $p p$, which are guided and supported by the headed rods passing through them, which are rigidly attached to the under side of plate D. The plates $s s$ operate to press the catch-levers or pawls $d d$

against the wheels K K, so as to catch in the cogs *q*.

g is a hand-lever, pivoted to support *n*, and resting upon the bar *o* and nut *v*, and so arranged that when it is depressed it also depresses the nut *v* and bar *k*, releasing the catches *r r*, and also depresses the bar *o*, leaving the catch-levers or pawls *d d* free to drop of their own weight, thus permitting the free backward sliding of the chase and carriage.

K' in Fig. 16 are wheels at the ends of plates D', around which the cam-chain K'' passes, the said plates forming a rigid backing for the cam chains or strips when the chase and carriage are pressed into position between the said cam chains or strips, as shown in Fig. 16.

In Fig. 17, K' are wheels which operate to crowd the cams on the flexible strip K''' in between the line-supports Y. The front end of the detachable cam-strip K''' is first pressed under the springs S' S' at the front end of the chase, and the chase is then pressed in between the loose rollers K', which said rollers force the cam-teeth into position as the plate is pressed forward, thus properly placing the line-supports, as hereinbefore described. The rear ends of the cam-strips are pressed under the spring S' at the rear end of the chase by the said rollers, and held rigidly in position. It is obvious that with the two ends of the strip thus rigidly secured the middle teeth of the strip must retain their position between the line-supports and cause them in turn to retain their relative positions until securely locked in place by means of the thumb-screw S, the flexible strip being first removed.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the sliding shelves W W, grooved block N, knife *c*, and receiving-shelf L, substantially as and for the purposes shown and described.

2. The combination of the sliding shelves W W, a pedal, guide-posts J J, and grooved block N, substantially as and for the purposes shown and described.

3. The combination of the sliding shelves W W, grooved block N, knife *c*, receiving-shelf L, and a chase or justifying-form, substantially as and for the purposes shown and described.

4. In a printer's chase or justifying apparatus, the combination of the series of adjustable movable line-supports, with means for securing and compressing the same, substantially as shown and described.

5. The combination of the series of movable line-supports Y, and means, substantially as described, for securing the same to a support,

with cams or cogs, by means of which they are held in position, substantially as and for the purposes shown and described.

6. The combination of the series of movable line-supports Y, and means, substantially as described, for securing the same to a support, with flexible cam-strips K''', wheels K', and springs S', substantially as and for the purpose shown and described.

7. The combination of the supports Y, rods *z z*, and blocks T and *y*, and means for compressing the supports, substantially as and for the purposes shown and described.

8. In an apparatus for putting type-bars in page or column form, a series of movable or adjustable supports, in combination with cams or cogs by means of which the supports are held in position, and which cams or cogs are readily removable, to permit the supports to be compressed, and with means for compressing the type-bars and supports together, substantially as shown and described.

9. The series of movable supports, recessed so as to admit the type-bars, and so that when compressed together the pressure will come upon the type-bars and hold them rigidly in position, with means for compressing the same, substantially as shown and described.

10. In a printer's chase or justifying-form, a series of movable line-supports, with means, substantially as described, for securing them to a common support, in combination with cams or cogs for holding the line-supports in position while the chase or form is being filled, and means, substantially as described, for compressing the same.

11. In an apparatus for paging or justifying type-bars, a series of supports for the lines, which are capable of being pressed together or spread apart, in combination with mechanism for compressing and separating the same, substantially as shown and described.

12. The combination of the chase, cam-wheels K K, catches *r r*, catch-levers *d d*, and lever *f*, substantially as and for the purposes shown and described.

13. The wheels K K, catches *r r*, and catch-levers *d d*, bar *o*, and springs, in combination with the lever *g*, substantially as shown and described.

14. The combination of the sliding shelves W W, grooved block N, knife *c*, swinging shelf L, chase with movable line-supports Y, and means for adjusting the supports, substantially as and for the purposes shown and described.

MERRITT H. DEMENT.

Witnesses:

JENNIE L. HUNTOON,
MINNIE E. HIBBEN.