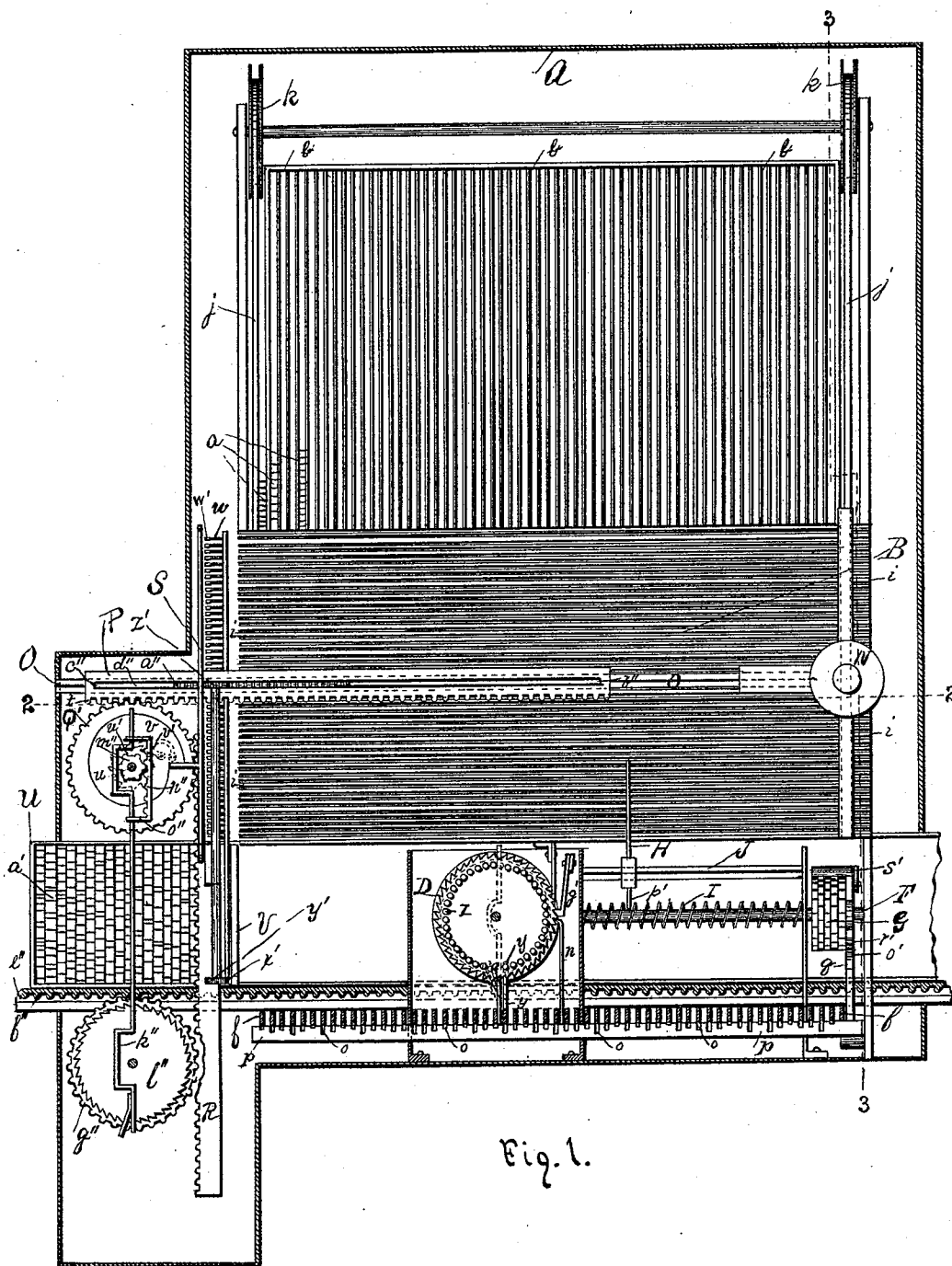


J. I. HAYNES.
TYPE SETTING MACHINE.

No. 494,564.

Patented Apr. 4, 1893.



Witnesses.
Wm. W. Crookes.
Wm. M. Byrne.

Inventor.
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Paul Baker,
his attorney

(No Model.)

9 Sheets—Sheet 2.

J. I. HAYNES.
TYPE SETTING MACHINE.

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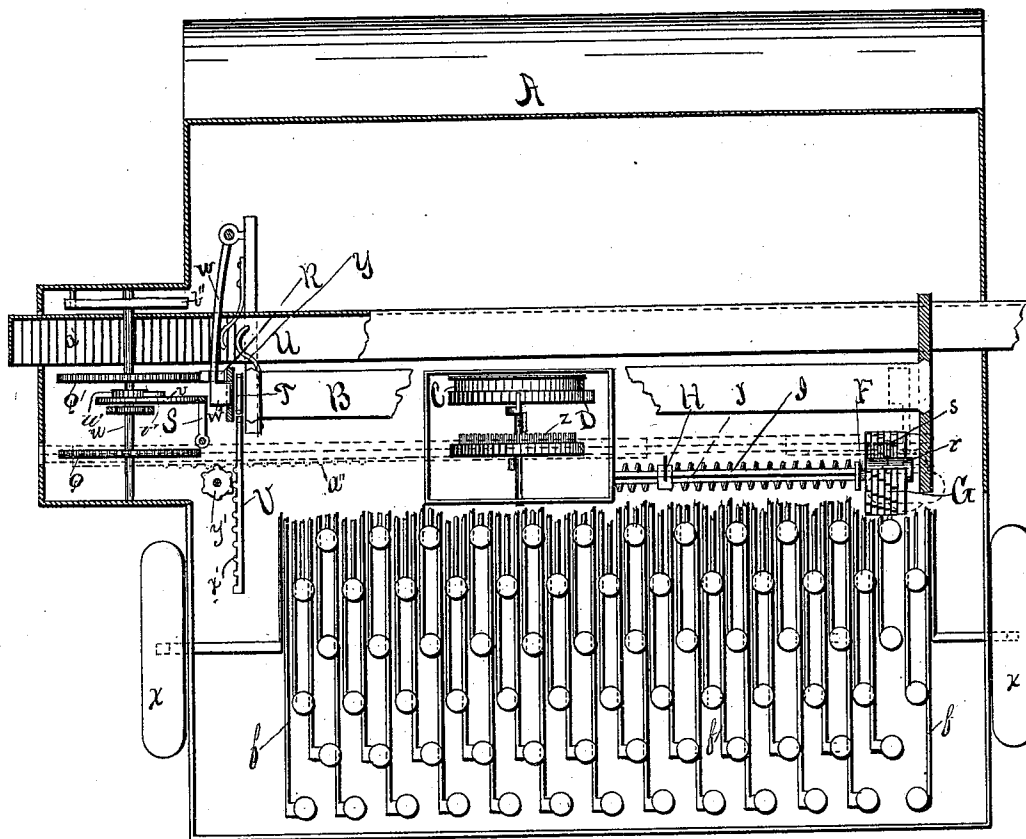


Fig. 2.

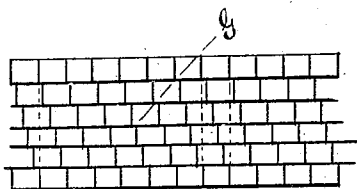


Fig. 9.

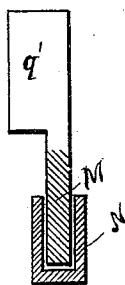


Fig. 8.

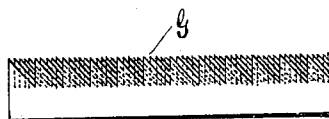


Fig. 10.

Witnesses.

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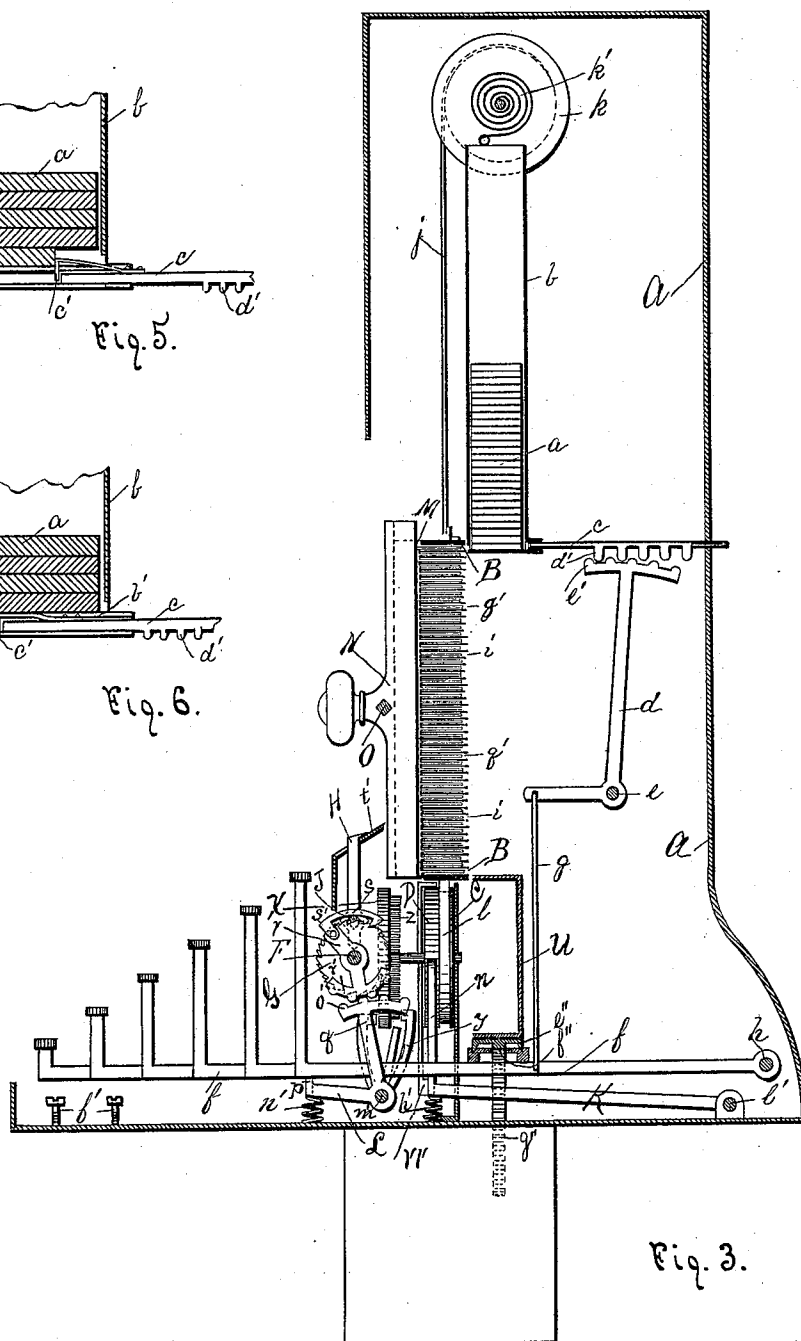
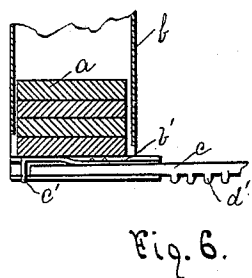
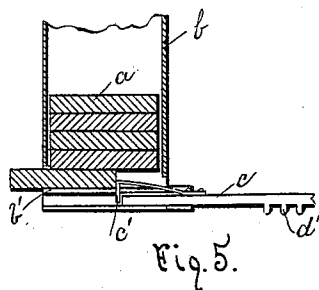
(No Model.)

9. Sheets—Sheet 3.

J. I. HAYNES.
TYPE SETTING MACHINE.

No. 494,564.

Patented Apr. 4, 1893.



Witnesses.

Jos^{ph} W. Crookes.
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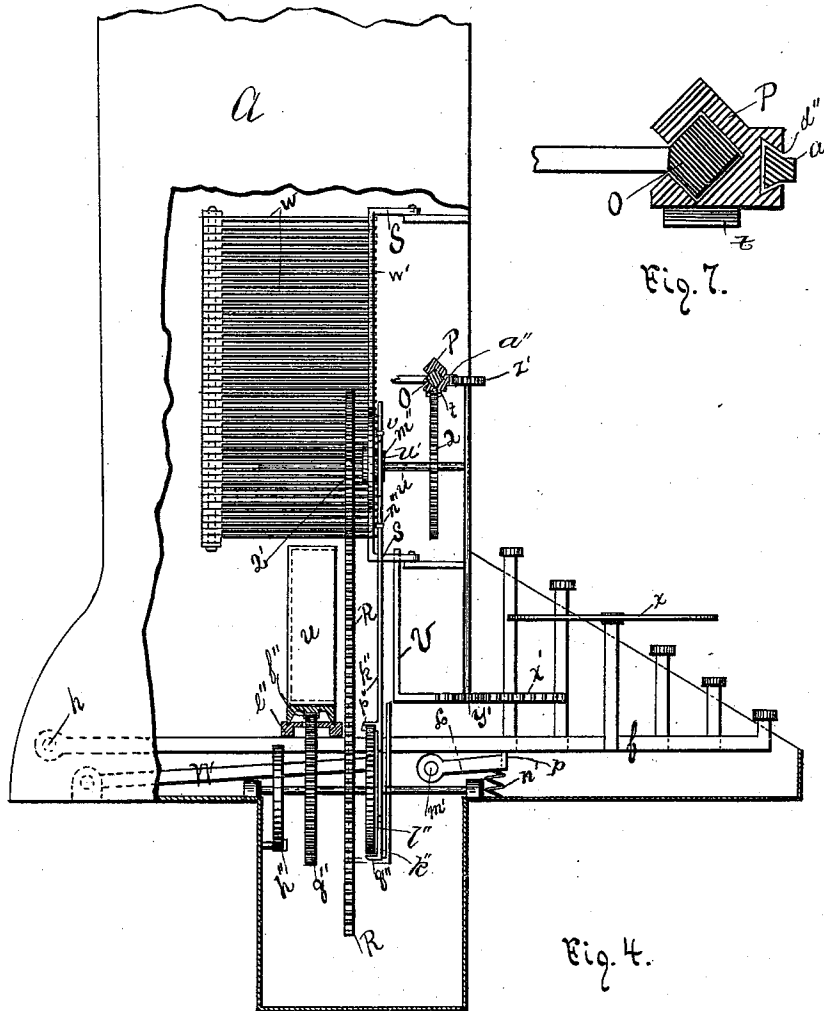
(No Model.)

9 Sheets—Sheet 4.

J. I. HAYNES.
TYPE SETTING MACHINE.

No. 494,564.

Patented Apr. 4, 1893.



Witnesses.

Jos W Crookes.
 Wm M. Byrne.

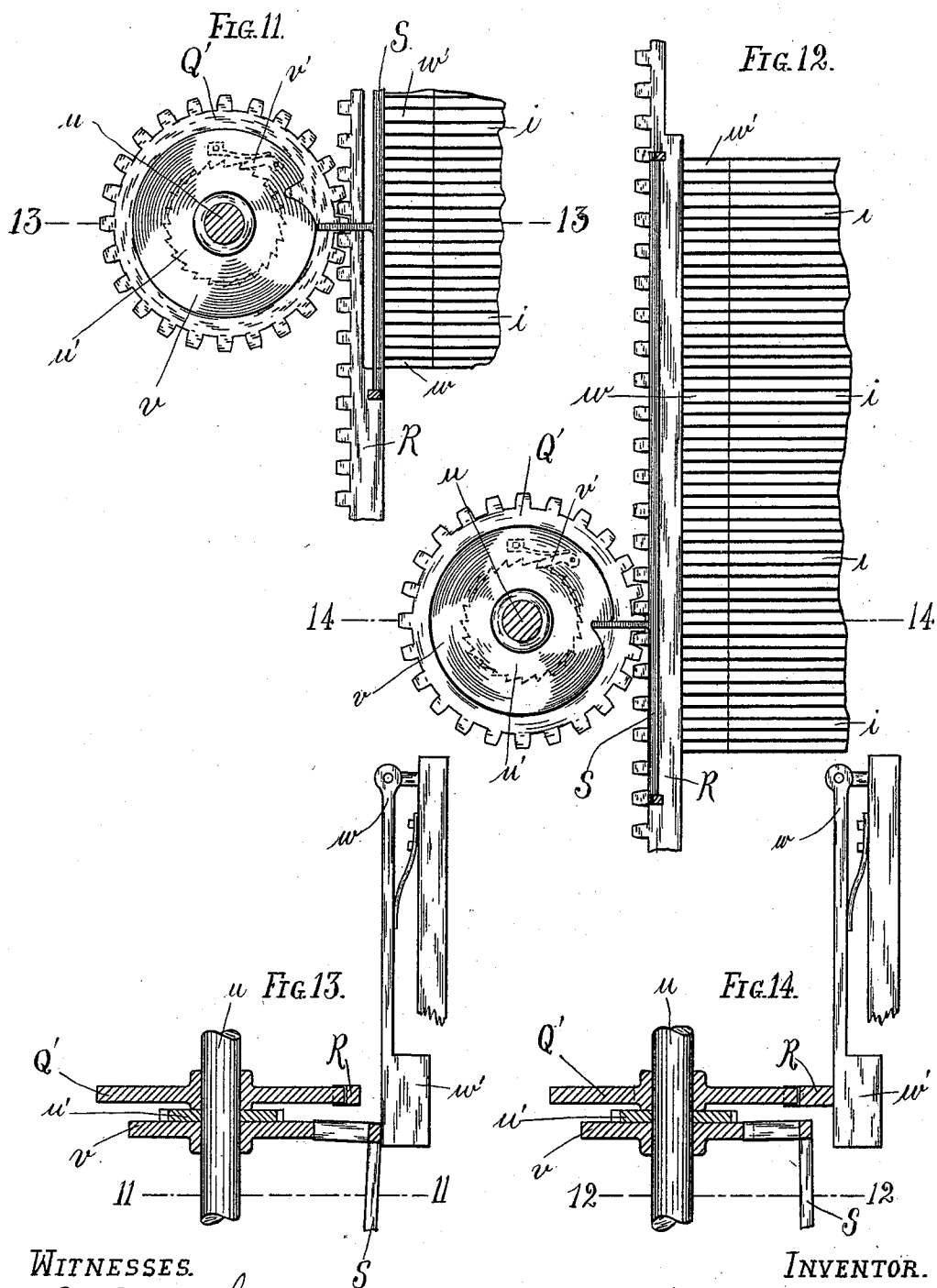
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J. I. HAYNES.
TYPE SETTING MACHINE.

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WITNESSES.

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9 Sheets—Sheet 6.

J. I. HAYNES.
TYPE SETTING MACHINE.

No. 494,564.

Patented Apr. 4, 1893.

FIG. 15.

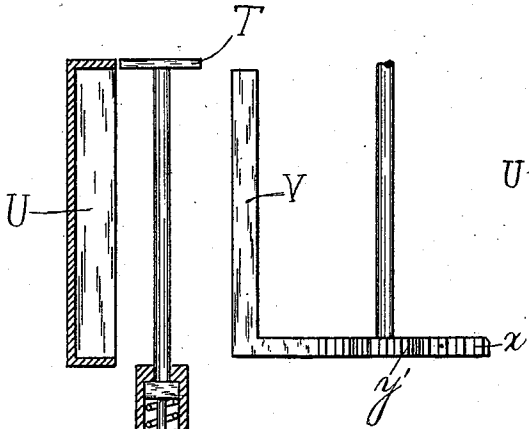


FIG. 16.

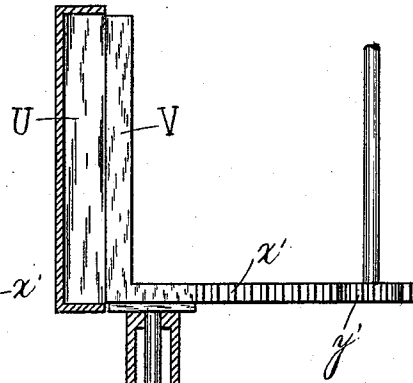


FIG. 17.

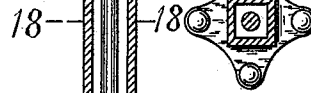
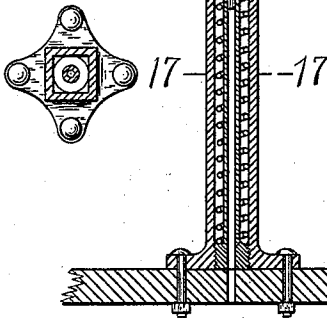


FIG. 18.

WITNESSES.

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(No Model.)

9 Sheets—Sheet 7.

J. I. HAYNES.
TYPE SETTING MACHINE.

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Patented Apr. 4, 1893.

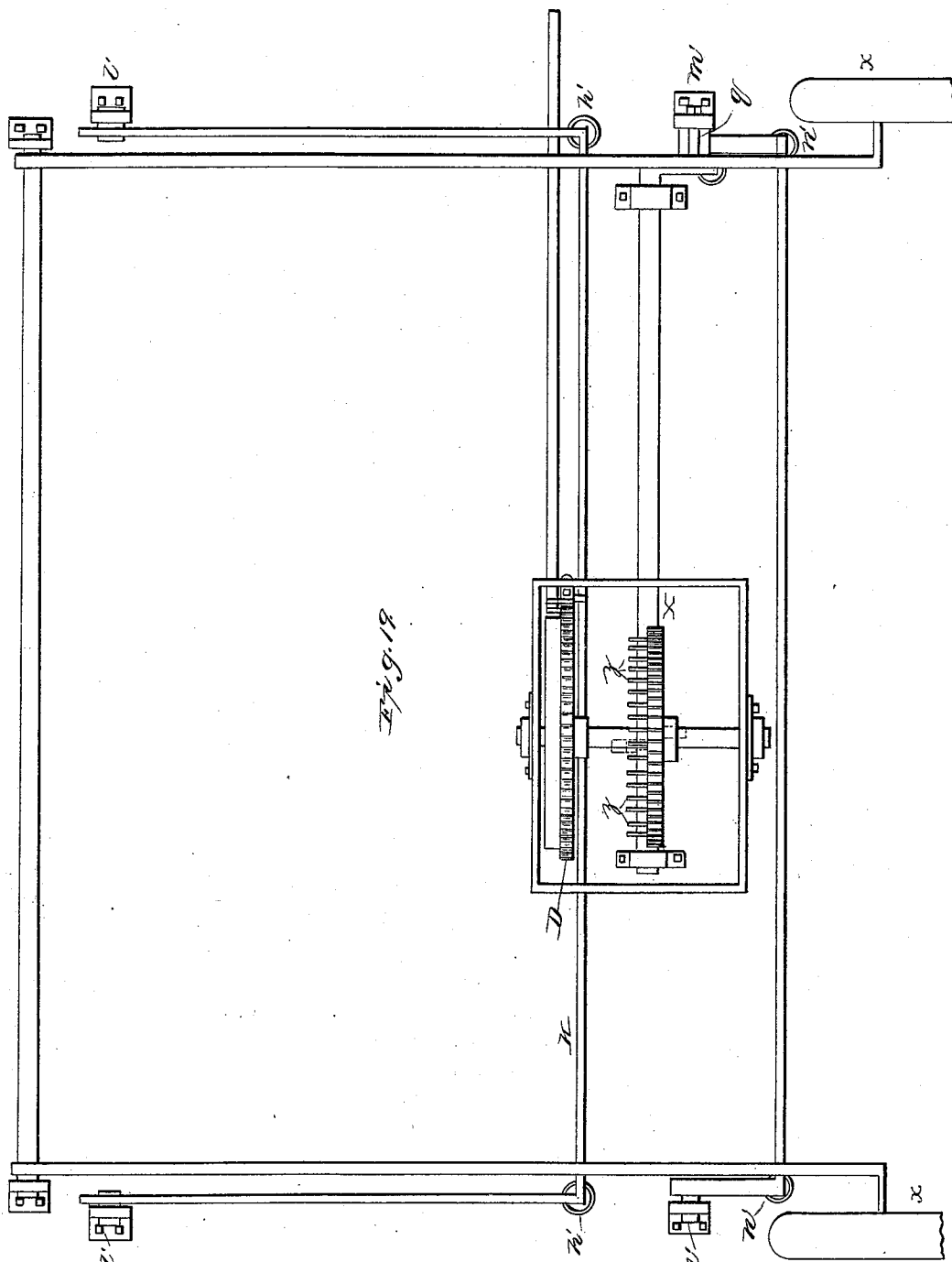


Fig. 18

Witnesses

J. R. Cornwall

J. W. Rutter Jr

Inventor

John I. Haynes

Paul Bakewell

By

Attorney

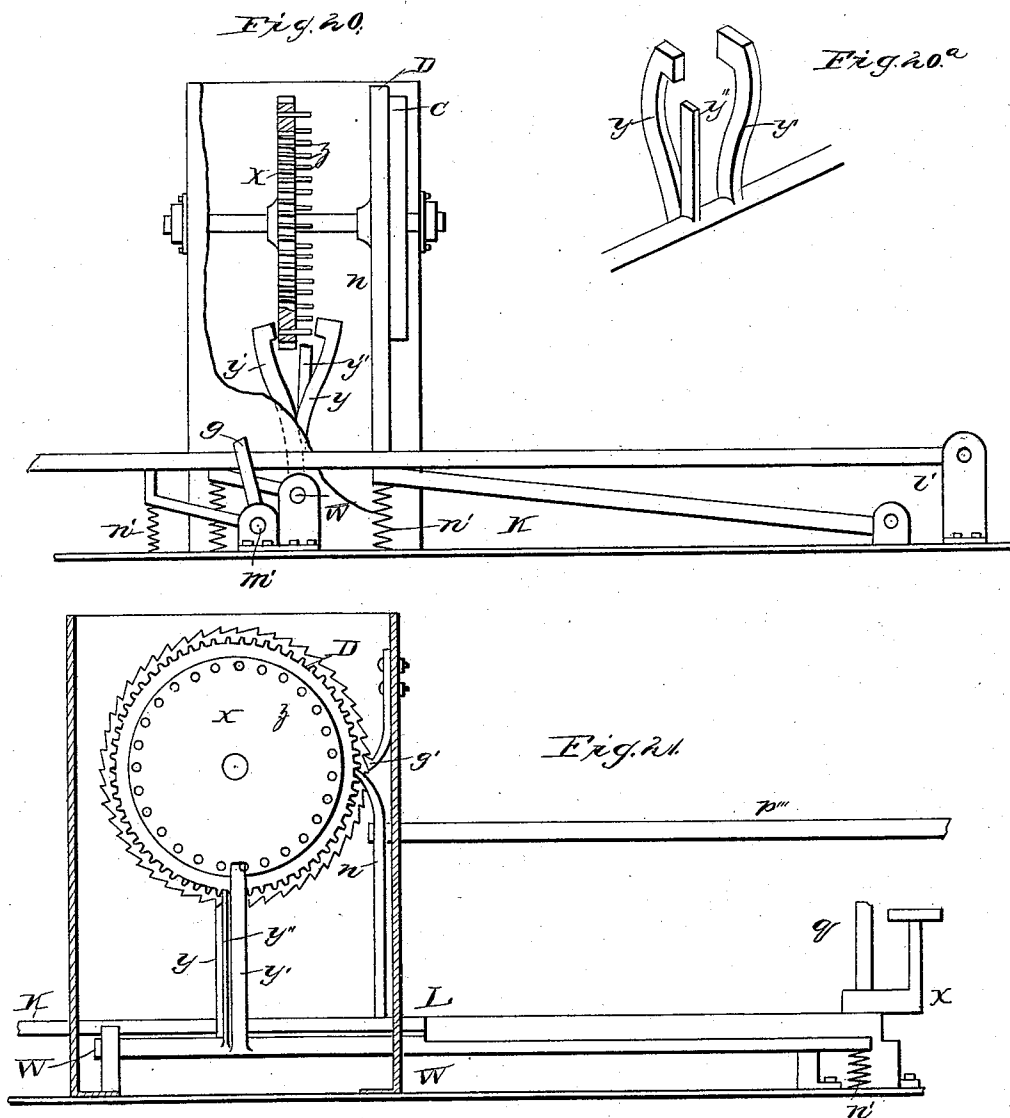
(No Model.)

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J. I. HAYNES.
TYPE SETTING MACHINE.

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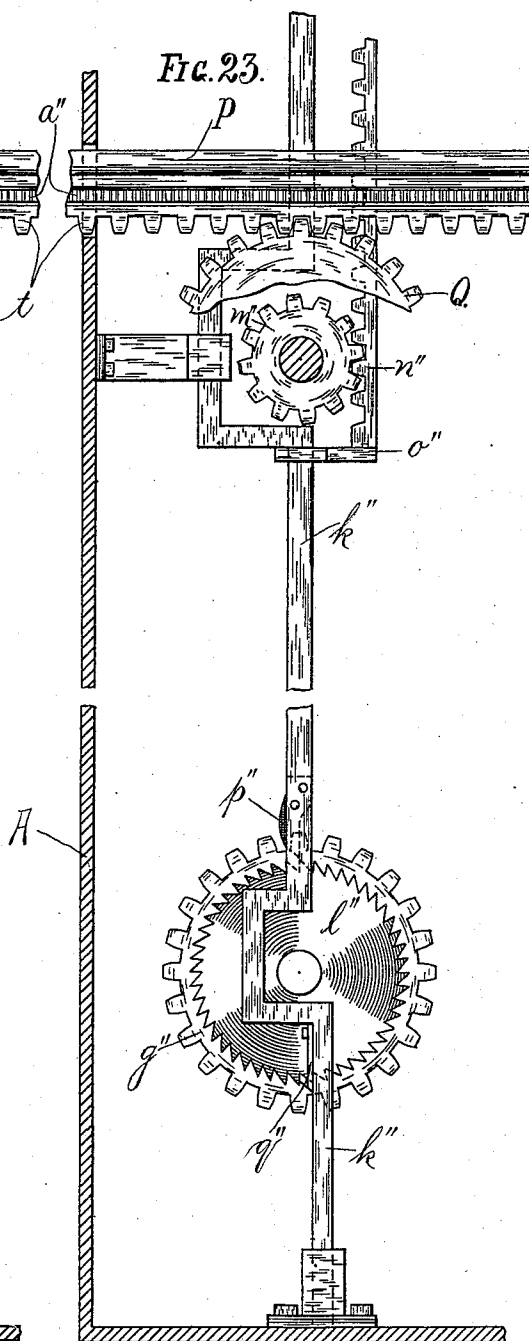
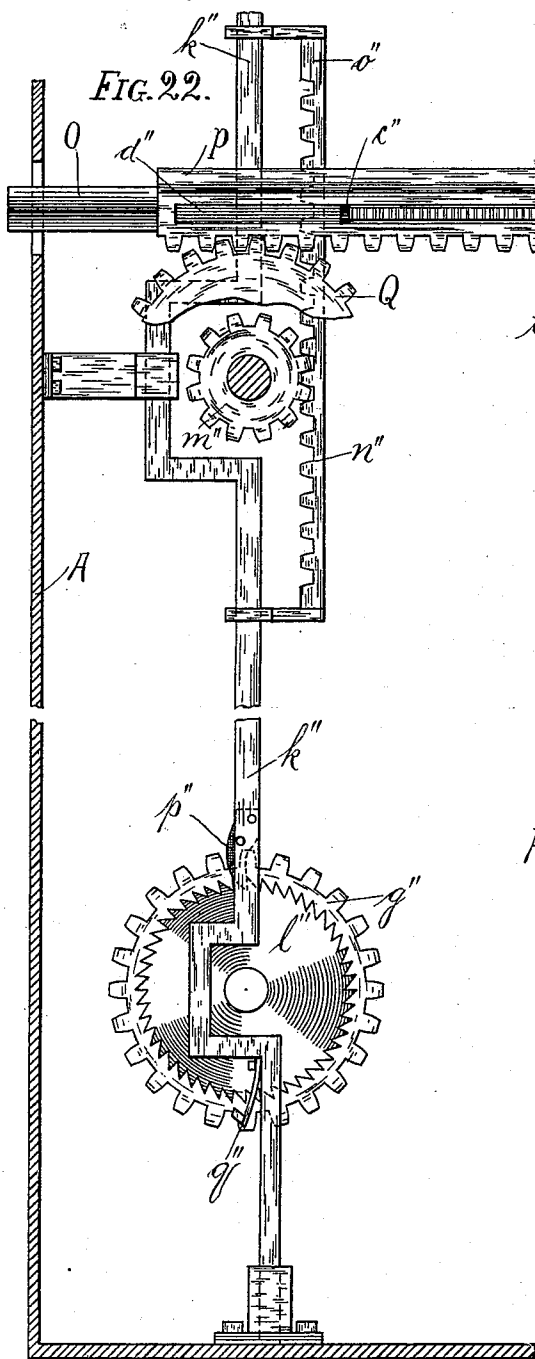
Witnesses
F. R. Cornwall
F. W. Pitter

Inventor
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Attorney

J. I. HAYNES.
TYPE SETTING MACHINE.

No. 494,564.

Patented Apr. 4, 1893.



WITNESSES.

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J. H. Crookes

INVENTOR.

John I. Haynes
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his attorney

UNITED STATES PATENT OFFICE.

JOHN I. HAYNES, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-THIRD TO JOHN FITZGERALD, OF SAME PLACE.

TYPE-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,564, dated April 4, 1893.

Application filed May 20, 1890. Serial No. 352,565. (No model.)

To all whom it may concern:

Be it known that I, JOHN I. HAYNES, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Type-Setting Machines, of which the following is a full, clear, and exact description.

My invention relates to that class of machinery in which the required functions thereof are performed by the hand or hands of the operator by means of a key-board conveniently arranged for the particular purpose and consists in features of novelty hereinafter described.

In the usual practice of setting type by hand the objections are that each type has to be picked up separately out of its particular compartment in the case and carried to and placed in the stick, care being taken that it is properly placed. When the line is word-full it has to be spaced out to the proper length. Each of the steps requires a separate and distinct movement, which requires time and is comparatively slow and expensive work.

The object of my invention is to do away with the tedious operation of picking up each individual type by hand and do it by a simple push of a key, which at the same time places the type in a suitable receptacle from which the separate letters are afterward gathered to form the words of the line by a single movement of the hand of the operator, and, further, to provide means by a correspondingly simple and quick operation for justifying the line and putting it in place in the galley. How I accomplish these objects will be made plain by the following description, reference being had to the accompanying drawings, in which,

Figure 1 is a front elevation of my type-setter with the key-board and the front portions of the containing case removed. Fig. 2 is a horizontal cross-section, taken on the line 2—2 in Fig. 1. Fig. 3 is a vertical cross-section, from front to back, taken on the line 3—3 in Fig. 1. Fig. 4 is an end elevation with portions of the containing case removed. Fig. 5 is a detail view of the bottom of the type-holders and the type-pushers. Fig. 6 is another view, as in Fig. 5. Fig. 7 is a cross-section of pushing sleeve, showing arrangement of guidebar and groove for rack cut in sleeve to accommodate rack. Fig. 8 is a cross-section of handle piece, showing groove cut in same to accommodate back of and operate the comb and shape of tooth of comb. Fig. 9 is a plan view of combination ratchet same as used in the shape of a ratchet wheel in the machine, but developed on a plane. Fig. 10 is a side elevation of the combination ratchet. Figs. 11 and 12 are enlarged views of the springs for the reception of the type when pushed out of the races by the comb M. Fig. 13 is a section taken on line 13—13 of Fig. 11. Fig. 14 is a section taken on line 14—14 of Fig. 12. Fig. 15 is an enlarged view of the galley, frame and pusher piece, the frame being in its raised position. Fig. 16 is a similar view showing the frame depressed and the position of the pusher piece after pushing a line of type into the galley. Fig. 17 is a section on line 17—17 of Fig. 15. Fig. 18 is a section on line 18—18 of Fig. 16. Fig. 19 is a plan of the space keys and adjacent levers. Fig. 20 is a side view of the same showing the casing of the ratchet mechanism partly broken away and the disk having pins therein, in section. Fig. 20^a is a perspective view of the rocking arms which act correlatively with the pins in the wheel X. Fig. 21 is a section through the casing showing the disk having pins therein, in front elevation and the pallets in position on the ratchet wheel. Fig. 22 is an elevation of the escape mechanism for the sliding galley. Fig. 23 is a similar view in a different position.

Like letters of reference denote like parts in the several figures.

I place the assorted type *a* in vertical channel receptacles *b*, using a separate channel for each sort of type used. The width and depth, from front to back, of these receptacles *b* correspond, respectively, to body and length of the type used. The bottom of these type-channels is formed, shown in detail in Figs. 5 and 6, by the bottom being partly cut away so as to leave room for the spring catch *c'* of the type-pushers *c* to slide in, and leaving the shoulders *b'* on which the supply column of type *a* normally rests. The several type-

channels *b* are left open at the top for inserting the supply of type and are all secured together and rigidly fastened to the frame-work of the containing case A. The type-pushers *c* have their end bearings in the general frame-work of the machine and are formed with a rack *d'* on their under side which fits into the gear-teeth *e'* cut in the arc end of the bent lever *d*, which is pivotally secured to the frame-work of the machine on a bolt *e*. This bolt *e* extends transversely across the machine and is secured to the frame-work and acts as a support for the several pusher levers. The free end of the levers *d* are connected to the key levers *f* by a connecting rod *g* which is loosely secured to the key lever at a point on the lever bar at such a distance from the fulcrum point *h* as to give the proper amount of movement to the type-pushers *c* when the keys are depressed to their adjustable stops *f'* placed under the forward end of the key bar. Sliding up and down in the grooves cut in the frame-work for that purpose, immediately in front of the vertical type receptacle, is a frame-work B of horizontally placed slats or bars forming the horizontal channels or races *i* into which the type *a* is received when pushed out of the bottom of the type receptacles *b* by the type-pushers *c*. Each of these races *i* must be wide enough to admit the body of the widest type in the font used and must be open at one end (the end to the left as shown) for reasons hereinafter specified. The frame B is supported by two straps *j* which are secured to the two ends of the upper side of the frame B and carried over two drums *k*, which contain coil springs *k'*. These springs *k'* are wound so as to tend to raise the frame B. This upward movement is prevented, or rather governed, by the strap *l* which is secured to the lower edge of the frame B and wound round the spring governed drum C. The spring in the drum C tends to pull the frame B down. The tension on the springs *k'* is strong enough to raise the frame B when it contains a line of type, if it were not held down by the strap *l* and the spring governed drum C. The spring in the drum C is strong enough to pull the frame B down against the upward pull of the springs *k'* and would do so if it were not for the spring operated pawl *g'* secured to the frame of the machine which engages and prevents, unless disengaged therefrom, the backward rotation of the ratchet wheel D which is rigidly secured to the same shaft as the spring drum C. The frame is allowed to move a step upward, or, rather, the ratchet wheel D, and with it the drum C, is forced a ratchet tooth forward against the resisting tendency of the coil spring in the drum C, by the pushing pallet *n* on its return movement after being lowered as hereinafter described. The pallet *n* is attached to a cradle bar K which is pivotally secured to a bolt *l'*, and extending across the frame-work of the machine and so situated under the key bars *f* as to be depressed, when-

ever any of the keys are used against a strong spiral spring *h'* which retains it in its normal position.

Extending across the machine, immediately under the key bars *f* so as to be operated by them is a bar *p* carried at the ends of rock arms L which are pivotally secured to the sides of the frame by the bolts *m'*. The bar *p* is supported in its normal position by the spiral spring *n'*. As an extension of, or secured to, the rock arms L at one of the ends at which it is pivoted, is the arm *q*, which terminates in the geared sector *o'*. The teeth of the sector *o'* fit into the gear cut in the sector *r'* which forms one end of the lever arm *r*. The lever *r* has its fulcrum bearing by being loosely mounted on and near the end of the screw threaded shaft F. The other or free end of the lever *r* is formed with a projection *s'* extending parallel to the shaft on which it is pivoted and over the several ratchet wheels G which are rigidly mounted on the shaft F concentrically therewith. The projection *s'* carries the several spring pallets *s* which engage and operate the several ratchet wheels G, thus giving a motion of rotation to the shaft F. This in turn moves the indicator finger H by the pin end *p'* being engaged in and propelled by the endless screw I cut in the shaft F. The indicator itself is mounted and slides on the square slide or guide bar J which has its ends pivotally secured to the frame-work of the machine, so that the indicator finger H can be rocked or brought forward, disengaging the pin *p'* from the screw I when it is desired to move the indicator back to the starting point, as at the beginning of a new line.

The amount of movement of the indicator finger is shown on a scale *t'* secured to the outside of the casing of the machine in view of the operator. The object of the indicator is to show at any time how much of the line has been set and, when it is word-full, to show how much space in the line there is yet to justify. To do this accurately it is obvious that the indicator must move a distance exactly proportional to the thickness of the different type set.

The movement of the different type-setting levers *f* is the same for all letters, so, to compensate for the different thickness of the types, notches *o* of different depths are cut in the bar *p*. Thus, for the definite movement of the different key levers *f* the bar *p* is depressed a different amount.

The compound ratchet wheel G is made up of two or more ratchet wheels placed side by side and fastened together concentrically on the same shaft, so that the distance between any two teeth on the same wheel is divided between the different wheels by the number that may be used. The object of this is to have in the combination a fine cut ratchet wheel for the pallets *s* which are in line, to drop into, leaving but little or no lost motion, and retain the large and comparatively strong

tooth of a coarse cut ratchet as in a single wheel.

When the line has been set the types and spaces are scattered throughout the length of the different races or channels *i* of the frame-work or compound stick B. To gather them together I make use of a comb-shaped piece M with its teeth fitting into and extending across the races *i*, shown in Figs. 3 and 8. The teeth *q'* of the comb are always inserted in the races *i*, normally at one end, at the right hand end as shown in the drawings. It must then travel up and down with the frame B. The comb M is operated by a handle piece N which is supported by and slides on a guide bar O by being secured to it by a split sleeve formed across the handle piece. The piece N is formed with a longitudinal slot open at both ends so as to permit the comb M, the back of which is inserted in it, to move up and down, as described.

On the guide bar O is placed a split sleeve P. This sleeve P carries on its under side the rack *t* which engages and operates, when the sleeve P is moved by being pushed by the sleeve of the handle piece N, as hereinafter described, the spur gear-wheel Q which is mounted on a shaft *u* set at right-angles to the line of the bar O. This wheel Q rotates the shaft on which it is mounted thereby rotating the spur gear-wheel Q' which is mounted on the same shaft. This wheel Q', in turn, operates the vertically moving rack R. Mounted on the shaft *u*, so as to be turned with it in one direction only by the ratchet *u'* and spring governed pallet *v'*, is a cam *v*. This cam operates the rocking bar S which, in turn, pushes in the springs *w* which carry on their ends the lugs *w'*. These lugs *w'*, when pushed in against the end of the frame B, when it is down, form an extension of the horizontal slats or bars forming the races *i* for the types to slip onto when pushed out of the races by the comb M. The springs are pushed in and held by the cam *v* and the rocking bar S until the rack bar R is raised when the cam releases the rocking bar S and it drops back to its original position. They are then held in by the body of the bar R. This is done in the forward motion of the handle N, the pitch of the different gear, racks, wheels and pinions being properly proportioned for that purpose. When the handle N is moved back, the bar R is lowered which releases the several springs *w* allowing them to spring back to their normal position consecutively, the top one first, thereby dropping the type resting on the lug projection to the next one below. The whole line is finally dropped onto the frame T which is held in position by guide rods let into the frame-work of the machine and is supported in a normal position immediately under the end of the frame B by a spring which is only strong enough to support the frame T when it has no extra weight on it, and is depressed by the weight of a line of type to a position on a level with the bot-

tom side of the galley U, situated immediately behind the line of movement of the frame T, as shown in Figs. 4, 15, and 16. The line of type is pushed from the frame T into the galley U, in behind a wide flat spring Y which holds the line in place when in the galley, by the pusher piece V which slides in its suitably constructed grooves in a line from front to back and is operated by a rack *x'* and pinion *y'*. The pinion *y'* is operated by being mounted on the same shaft and turning with the pinion *z'* which is engaged and operated by the rack *a''*. This rack slides in a longitudinal groove *d''* cut in the front side of the sleeve P to accommodate it and is operated by the stops *b''* and *c''* set in the groove *d''* abutting against the ends of the rack *a''*. The object of this arrangement is to transmit only part of the movement of the sleeve P to the rack *a''* so that the line pusher piece V is operated, when the several parts operated by the movement of the sleeve P are in a position as not to interfere. The galley U is placed on and removably secured to the platform *e''* which slides in suitably cut grooves in the frame-work of the machine. The platform piece *e''* is formed with a rack *f''* on its under side. This rack *f''* fits into the gear of the spur gear wheel *g''*. When the galley platform *e''* is pushed in, so as to bring the galley in the proper position to receive the line of type when the first line is put in, the shaft on which the gear wheel *g''* is mounted is rotated. This winds up a spring *h''*, the end of which is secured to the shaft and the other end to the frame-work of the machine. The tendency, obviously, of the spring will be to bring the platform back out. This is prevented by the locking device *k''* engaging the teeth of the ratchet wheel *l''* which is mounted on the same shaft as the gear wheel *g''* and turns with it. This locking device *k''* is operated by a rack *n''* and a pinion *m''*, the pinion being mounted on the same shaft and turning with the gear wheel Q. The rack *n''* is not placed directly on the locking bar *k''* but on a separate bent piece *o''* which operates the bar *k''* by abutting against shoulders formed by a bend in the same. The object of this is to operate the locking device, allowing the galley platform to move a step (which will be a distance equal to the body of the type being used in the machine) outward at the proper part of the movement of the handle piece N. The locking bar *k''* carries two pawls *p''* and *q''* one of which, *q''*, is a spring pawl. One of these two pawls is always in position to engage the teeth of the ratchet wheel *l''* and prevent its rotation. To allow it to rotate the bar *k''* is oscillated up and down by the handle N through the intermediate gearing as described. The two spacer keys *x* operate the same key lever see Figs. 2 and 19 and the same type pusher, which pushes a three-em space into the compound stick B, but in depressing the cradled frame K, they, or either

of them, depress it enough for the pallet *n* to take up two teeth of the ratchet wheel D so as to raise the frame B two spaces in its return. This leaves a vacant race between words.

5 The object of this is to have an opportunity to justify. The justification is done when the frame B is let down. The spacer keys *x*, while doing the work of an ordinary key, also operate in their stroke, a cradled frame W see

10 Figs. 20 and 21 which, in turn, operates an arm *y*. This arm *y*, when operated by the spacer keys pushes a pin *z* out toward the front side of the disk wheel X so as to mark the place, or locate the point in the move-

15 ment of the frame B, at which a blank space is left, as described, the wheel X being mounted on the same shaft as the ratchet wheel D and turning with it. When the frame B is let down, by the pallet *n* and ratchet

20 *g'* being thrown out of interference with the ratchet wheel D, as hereinafter described, the several pins *z* are in a position to interfere with the arm *y''* and be held there while the proper space is pushed in by its respective

25 key which space will be a proportional part of the justifying space, as shown by the indicator to be left when the line is word-full. The arm *y* has a counter arm *y'*, (see Figs. 20, 20^a and 21) projecting in an opposite direc-

30 tion from the same shaft, the whole being spring supported as at *n'*, in order to normally hold the arm *y'* in juxtaposition to the disk wheel X. In front of the arm *y*, is introduced a dog *y''*, the function of which being, to en-

35 gage the teeth on the disk wheel X, and prevent its rotation while the pins *z* are being operated upon. The normal position of the pins in the disk wheel X being one to the rear, when the space key *x* is depressed to

40 indicate a space for justification, the shaft or cradle bar W, is rocked forward, which movement forces one of the pins *z* forward, through the medium of the arm *y*, behind, (in the line of rotation of the disk wheel X)

45 the arm *y'*. During the movement of the arm *y* forward, the dog *y''* engages the teeth on the wheel X, and holds the same stationary until the arm has completed its operation of forcing one of the pins in front of the disk

50 wheel. When the line has become "word-full" and the spaces ready for justification, the disk wheel X revolves until the pins *z* strike against the arm *y'*, after which, the cradle bar W is again rocked, and as the arm

55 *y* will strike in an empty space, it will not act upon the pins *z*, but the dog *y''* acting in conjunction with the teeth on the disk wheel, will hold the same stationary, until the operation of justifying is completed, after which,

60 in its rearward movement, it releases the wheel X, and the pins *z* are forced back to their normal position, by the quick, spring action, of the arm *y'* attempting to assume its normal position against the wheel X, after

65 which, the wheel again rotates until the next pin strikes against the arm *y'*, when the same operation is completed.

From the foregoing description it will be evident that the line pusher V will do its work in the forward or first part of the move- 70 ment of the handle N and that, unless, there is a line on the supporting frame T, it will be in the way to interfere with the movement of the pusher V. In operating the machine it will be necessary to in some way depress 75 this frame T when the first line is being gathered together. This is done by having the lower end of one of the guide bars referred to extending beyond the casing A so as to be convenient to be grasped by hand 80 and be pulled down.

I have described the method of controlling the motion of the frame B by having the lower spring the stronger, thus having to put power enough against the key bar retaining 85 springs to raise it against this strong spring. It may prove advisable to make use of another means of controlling the position or movement of the frame B by having the upper supporting springs strong enough to raise the 90 whole and by depressing the frame by foot power against them at the beginning of the line and merely releasing or tripping a retaining device by a depression of the keys.

The pallet *n* and ratchet *g'* are thrown out 95 of interference with the ratchet wheel D by one of the keys being so arranged (not shown in the drawings) as to operate a cam with projecting pins suitably placed to do this.

The pins *z*, when the line has been justified, 100 are pushed back to their normal position in the disk wheel X by a flat disk (not shown in the drawings) being loosely mounted on the same shaft as the pin wheel X in such manner that it can be slid on the shaft from front 105 to back.

I claim—

1. In a type setting machine, vertical receptacles for the supply of type formed with an opening at the bottom through which the 110 type can be pushed out, pushing bars for pushing the type out of the supply receptacle operated by keys arranged so as to form a convenient key board, a compound stick formed with a separate place to receive the several 115 types as they are pushed out of the supply receptacle, means for gathering the several types set together so as to form the line and place the same in the galley, consisting in a comb formed piece so placed as to slide the 120 type to one end of the horizontal races forming the compound stick, automatically actuated type supporters for letting the type down to a position from which it is convenient to push it into the galley, an automatically op- 125 erated line pushing device for placing the line in the galley, and an automatically moved galley, the whole combined and operated substantially as described.

2. In a type setting machine, the combination with the channel ways having shoulders 130 at their bottoms to support the columns of type, and an exit opening for said type, of a type pusher having a spring on its upper face

for engaging the type, and having a rack on its under side, a sector wheel for engaging said rack, and means for actuating said sector wheel; substantially as and for the purposes described.

3. In a type setting machine, type pushing bars for pushing the type out of the vertical receptacles, suitably supported, formed with a spring actuated pushing catch, sliding in suitably cut grooves immediately under the column of type in the vertical type receptacles, and operated by the depression of a key through intermediate gearing and connecting rods, substantially as described.

4. In a type setting machine, a frame work of horizontally placed slats or bars forming a compound stick of the several channels or races for receiving the type when pushed out of the type receptacles, the whole rigidly secured together and sliding in suitable grooves permitting of a vertical movement of the compound stick immediately in front of the openings in the type receptacle so that the different races can be placed in a position convenient to receive the type when pushed out of the receptacles and supporting mechanism for the whole so as to permit of such different positions relative to the openings in the type receptacles, substantially as described.

5. In a type setting machine, a vertically moving compound stick or frame of horizontal type races open at the back and front and at one end, in combination with supports for the same consisting in a strap or straps secured to the frame and carried over a spring actuated drum or drums, the springs tending to and being capable of raising the frame, a connecting strap or straps between the frame and a spring actuated drum, the tendency and the strength of the spring being able to lower the frame against the raising spring or springs, a retaining pawl engaging a ratchet wheel governing the rotation of the lowering spring drum and a spring pushing pallet, for forcing the ratchet wheel a step forward so as to allow the frame to move a race upward, attached to a pivotally secured cradle frame so placed as to be depressed, and the pallet actuated by the keys when they are operated to push the type out of the type receptacle, substantially as described and for the purposes specified.

6. In a type setting machine, a vertically moving frame of horizontal type receiving races, in combination with a comb shaped piece which has its teeth extending into and across the type races and moves with the frame and a handle piece mounted on a sleeve sliding on a horizontal guide bar, substantially as and for the purposes described.

7. In a type setting machine, a vertically moving frame of type receiving races, in combination with a comb shaped piece for gathering the types set in the different type races, a handle for operating the comb, springs carrying lugs or projections on their ends which

are normally in a position to leave an open space between them and the ends of the bars or slats forming the horizontal type races and when pushed in against the frame when it is down to form a continuation of the same, a rocking frame for pushing the springs in actuated, through intermediate cams, gears, racks and wheels, by the movement of the comb handle, a vertically moving bar for releasing the springs from their normal position actuated, through intermediate gearing, by the movement of the comb handle and a spring supported frame for receiving the line of type when it is dropped from the spring lugs, substantially as described.

8. In a type setting machine, a line pushing piece sliding in grooves in the frame work of the machine for pushing the line of type from the supporting frame, onto which it has been dropped after being gathered together, into the galley, operated, through intermediate gear wheels and racks, by the comb handle, substantially as described.

9. In a type setting machine, the combination with a rod and a spiral thereon, of a series of "step by step" ratchets on said rod, pallets for actuating said ratchets, and an indicator having a depending arm for engaging the spiral, whereby the indicator will show how much of the line is set, when the line is word full, and how much space there is to justify: substantially as and for the purposes described.

10. In a type setting machine, an indicator for showing how much of the line has been set in combination with an endless screw for operating said indicator, a ratchet wheel mounted on the shaft of said screw, a pallet for operating said ratchet wheel secured to a pivotally secured cradle frame which is operated by the type setting key bars, substantially as described.

11. In a type setting machine, the combination of a compound stick moving in vertical grooves, supported and governed in such movement by being secured to spring operated drums, with a wheel, secured to the same shaft as the governing spring drums, supplied with pins which are thrown into a position of interference with a locking bar by the depression of the key bar used to set the spaces between words, thereby marking or locating the place or race in the compound stick in which to insert the justifying spaces in the descent of the compound stick, substantially as described.

12. In a type setting machine, a galley rigidly secured to a platform sliding in grooves or ways so as to present different portions of the galley in a position convenient to receive the line of type when set and gathered together, the movement of said platform being caused and governed by a rack attached to the platform engaging a gear wheel to the shaft of which is attached a spiral spring, against the tension of which the platform is forced and to the said shaft of which is attached

a ratchet wheel, the unlocking or tripping of which is operated by the same mechanism that operates the device for pushing the line of type into the galley, through intermediate
5 racks, gears and pinions, permitting the platform with attached galley to move a step or line forward subsequent to each movement thereof, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 1st 10 day of May, 1890.

JOHN I. HAYNES.

Witnesses:

PAUL BAKEWELL,
A. RAMEL.