

(Model.)

3 Sheets—Sheet 1.

O. M. PETERSON.

MACHINE FOR SETTING AND OBTAINING IMPRESSIONS FROM TYPE.

No. 306,423.

Patented Oct. 14, 1884.

Fig. 1

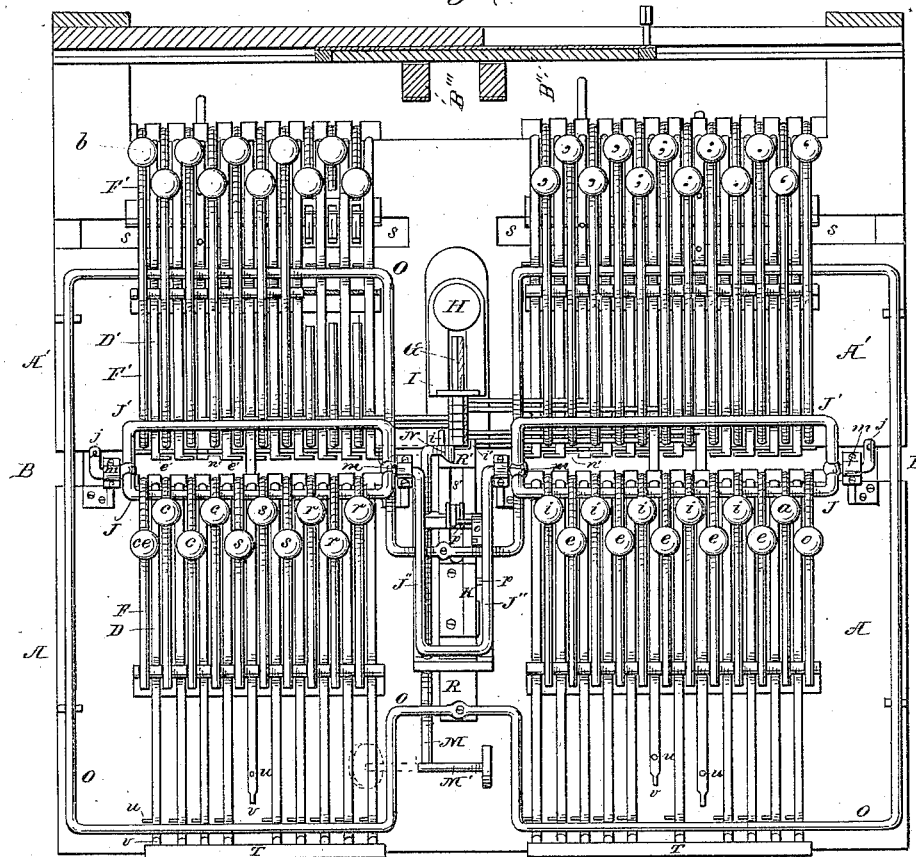
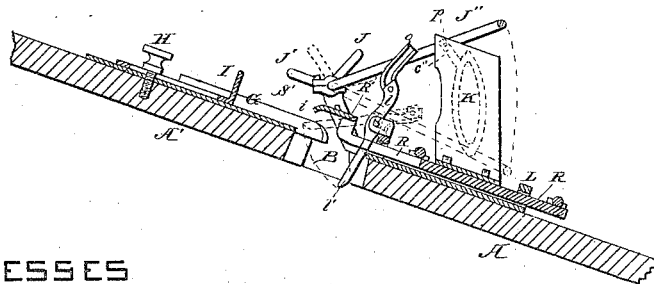


Fig. 4



WITNESSES

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(Model.)

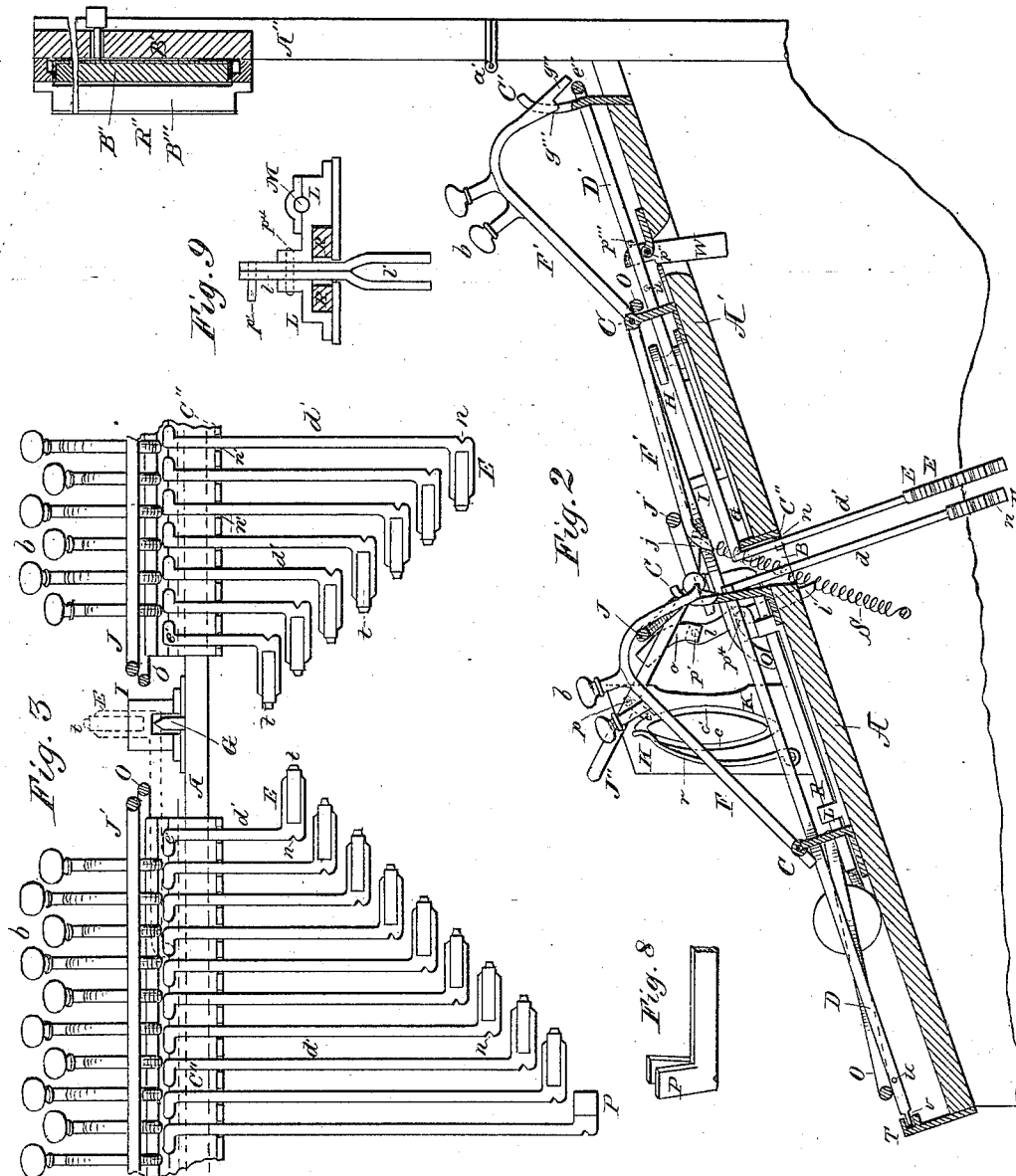
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3 Sheets—Sheet 2.

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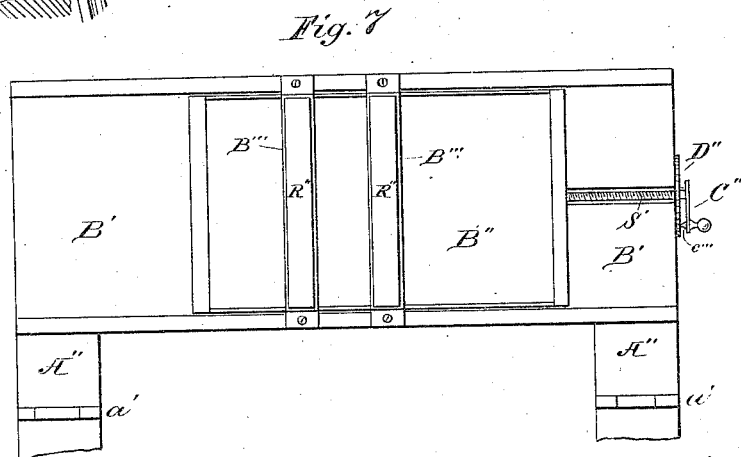
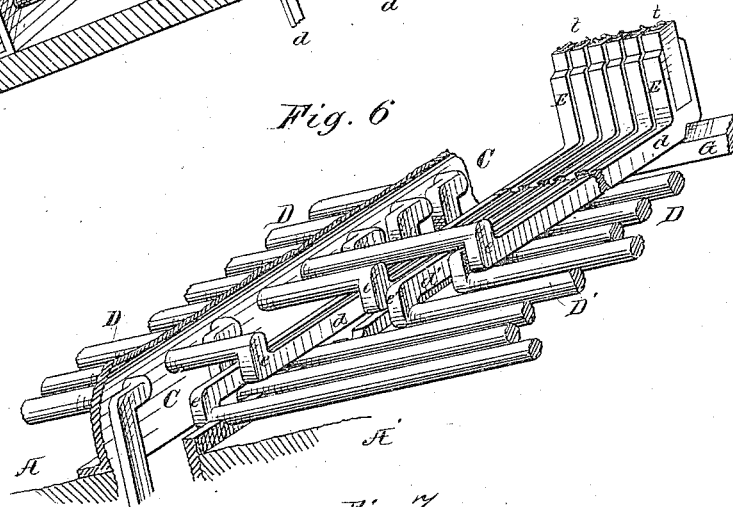
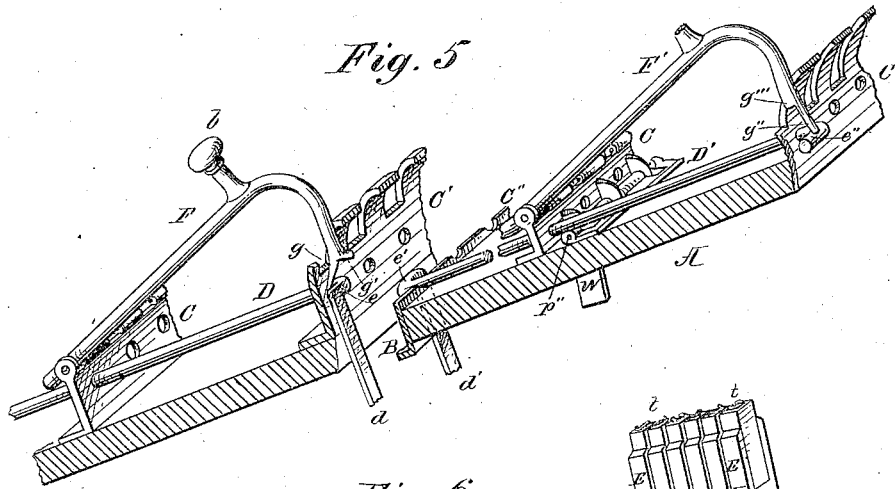
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MACHINE FOR SETTING AND OBTAINING IMPRESSIONS FROM TYPE.

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UNITED STATES PATENT OFFICE.

OLE M. PETERSON, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TYPOGRAPH MANUFACTURING COMPANY, OF ILLINOIS.

MACHINE FOR SETTING AND OBTAINING IMPRESSIONS FROM TYPE.

SPECIFICATION forming part of Letters Patent No. 306,423, dated October 14, 1884.

Application filed June 27, 1879. Renewed October 4, 1881. Again renewed January 19, 1884. (Model.)

To all whom it may concern:

Be it known that I, OLE M. PETERSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Setting and Obtaining Impressions from Types; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an apparatus for setting, taking impressions from, and distributing types; and it consists in the several devices and combinations of devices hereinafter described and claimed.

The letters employed in the drawings severally indicate corresponding parts in the several figures, excepting those letters which appear on the circular knobs in Figure 1, which indicate the letters or types carried by the moving parts of the machine operated by the several knobs.

Fig. 1 is a top view of my apparatus, in which are shown a limited number of rods to which type-arms are attached, together with their operative mechanisms, but a sufficient number to illustrate the arrangements and movement of the parts. Fig. 2 is a vertical transverse section near the center of the machine. Fig. 3 is a fragmentary longitudinal section through the central space shown in Figs. 1 and 2. Fig. 4 is a fragmentary vertical transverse section through the center of Fig. 1. Fig. 5 is a fragmentary perspective view showing the special parts. Fig. 6 is also a fragmentary perspective view, specially designed to show how any number of the type-bearing bent arms may be thrown into position to bring the types into line. Fig. 7 is an elevation of the hinged impression-bed. Fig. 8 is a detached view of one of the expansible "spaces" employed in the machine. Fig. 9 is a detached view of a forked lever used to finally lift the type-arms to proper height, as will be explained.

A and A' are two sections of an inclined table, supported on a suitable frame at proper

height, and separated by a central longitudinal space.

B, C, and C' are longitudinal supports, perforated to receive the rods D and D', arranged in two series parallel with each other on the respective sections A and A' of the table, said rods having free movement in said supports, so as to both rotate and slide longitudinally therein. These rods are provided with arms, which, when not in use, are pendent through the central space, B, of the inclined table, each of said arms being set at a right angle with the rod to which it is attached. These arms are shown pendent in Figs. 2 and 3. At the extremity of each arm is formed a head, E, directed at a right angle with the arm, into which head is set and secured a type. When the machine is at rest and the arms pendent, the arms of each series and their heads are in the same longitudinal inclined plane, as shown in Fig. 2. These heads and the type which they bear are to be thrown up at a common point in the space B, in order to form a line, as will be hereinafter explained. The arms to which the types are attached therefore require to be of increased length, according to the remoteness from such point of the rods upon which they severally rotate into place. They thus hang with their extremities or heads in oblique lines, as shown in Fig. 3.

G represents a supporting guide-piece or composing-bed fixed to the section A' of the table, running upward from and at right angles with the lower edge of said section. The several types and the heads to which they are attached are raised through the space B opposite the end of this guide-piece, and are slid along thereon to form a straight line. For this purpose the upper margin of said guide-piece is made A-shaped, as shown in Fig. 3, and the lower end of each head is correspondingly notched at n.

It is intended that the machine shall be provided with several types of each letter of the alphabet, both capital and small letters, several spaces, and several of each of the characters and punctuation-marks used in print-

ing, so that a single line of any desired length, according to the purpose of the machine, may be set up.

Now, in order that the types may be selected and brought into line in the almost infinite number of changes or orders of arrangement required for this purpose, there are formed at the juncture of the rods D and D' with the arms *d* and *d'* offsets *e* and *e'*, turned in opposite directions in the upper and lower series, by which, as shown in Fig. 6, the arms of both series, when rotated into horizontal positions to support the types in line on the guide or bed G, take their places in a common plane intermediate between the planes occupied by D and D', respectively, the former of which is shown in said figure and in Fig. 2 to be somewhat higher than the latter. Each of the arms is thrown up, or the rod to which it is attached is rotated, by means of movable keys, the finger-pieces or knobs of which are generally indicated by the letter *b*.

The manner in which I have chosen to operate the arms of the several series is separately and more distinctly shown in Fig. 5, wherein the knobs *b* are attached to bent arms F and F'. Said arms are pivoted to the parts C, F being the key-arms of the lower series, and F' the key-arms of the upper series. The free end of each of the key-arms F, as shown in Fig. 5, is provided with a backwardly-inclined projection, *g*, and the forward projection, *g'*. The projection *g* rests in such a position as to fall, when the key-arm is depressed, behind the offset *e*, and its operation is first to throw the arm and the rod D, to which the arm is attached, forward to a point midway in the space B of the table. At this point the projection *g'* rests upon the offset or shoulder *e*, and further depression of the key-arm F operates to rotate the bar D and to swing the arm *d* upward into horizontal position.

To prevent rotation of the bar in the first or horizontal movement mentioned, the lower end of the bar (not shown in Fig. 5, but shown in Figs. 1 and 2) is squared or provided with the flat end *v*, which lies in a groove formed in the head T, fastened to the lower margin of the section A of the table, it being arranged that the squared end *v* shall escape the groove in head T when the arm shall have been thrown out the proper distance midway of the space B, so that said arm may be rotated or thrown up into horizontal position, as described, without coming in contact with other arms of either series. As the offset *e'* of the upper-series is turned in a direction opposite to that of the offset *e* in the lower series, it is not available to rotate the arm to bring the type into place, and I, therefore form a bent projection, *e''*, on the upper end of the rod D', to serve as a crank or lever, through which the proper movements are given to the arm *d'* of this series by the key-arm F'. Said key-arm is pivoted to the guide C, and has on its free end the inclined projection *g''* and the horizontal projection or shoulder *g'''*. The in-

clined projection *g''* is arranged with reference to the bent end *e''* of bar D' to first throw the bar longitudinally downward and bring the type-arm *d'* to a point midway of the space B. When thus thrown downward, the projection or shoulder *g'''* strikes the bent end *e''* of the bar D', and by further depression of the key-arm F' said bar is rotated and the type-arm *d'* is thrown up into horizontal position to bring its type into place. Rotation of the rods D' during their longitudinal movement is prevented by means of notches *n'*, formed on a horizontal flange of the metal strip C'', fastened to the lower edge of the upper section, A', of the table, which strip has the further purpose of supporting the lower ends of the bars D'. In what manner the type-arms *d'* are drawn upward and held in these notches will be hereinafter explained in connection with the distributing process.

For the purpose of accommodating the numerous type-arms and types in the machine, and to avoid the use of longer type-arms than necessary, the whole number of types, arms, and other mechanisms for their individual manipulation is divided about equally, one half being placed at the right and the other half at the left of the central point of the table, at which point the line of type is to be set up.

Fig. 6, to which reference has been made, shows the direction of the offsets *e* and *e'* in the double series at the right.

It is plain that, in order to bring the types of the double series at the left upward at the same point with those at the right, the offsets *e* and *e'* of the type-arms at the left will be on sides of the arms opposite those at the right. As each type is lifted by the mechanism described into the central position opposite the supporting bed-piece G it is pushed upward upon said guide-piece, and held while the succeeding types are brought into place upon the guide-piece until the line is completed. The length of the line is determined by a sliding gage, I, held by the thumb-nut H. (Clearly seen in Fig. 4.)

The mechanism by which the types are successively pushed upward and held on the bed-piece G consists in the devices next described.

R is a sliding bar arranged upon the lower section, A, of the table and opposite the composing-bed G. Said bar is held in place beneath the guide L, and is given a reciprocating movement by means of a cam-plate, K, secured thereto in a vertical position, as shown in Figs. 2 and 4. On one side of said plate is cut a cam-groove, *c* and *c'*, having a branch, *c''*, as shown in said figures. J and J' are parallel parts of rocking frames, one on each side of the center of the table. Each frame is pivoted in bearings *m*, and the two are centrally connected, as shown in Fig. 1. The part J of each frame extends beneath the curved key-bars F of the lower series, as more plainly shown in Figs. 1 and 2, and the part J' extends over the lower prolongations of the key-bars F' of the upper series, as appears plainly

in Fig. 2. At the ends of the frames near the center of the machine the journal of each is extended to form the lever J'' , which moves vertically in proximity to the vertical cam-plate K, and is provided with a pin, p , which rests in the cam-groove of said plate.

In Fig. 2 the pin p upon lever J'' is shown in the branch groove c'' , which is its proper position when the types are to be distributed.

10 When setting type, said pin will be in the upper extremity of the continuous groove c' , and the arm is held up by means of the spring S, connected to a fixed point beneath the table, and to a short arm, j , upon the other extremity of the journal of the rocking frame. By depressing either of the key-arms the frame $J J'$ is rocked, and the lever J'' is depressed, carrying the pin p downward in the groove c' of the plate K. The direction of this groove is such that during about half the downward movement of the lever J'' the bar R is retreated or removed from the bed G, and during the remainder of its downward movement said bar is again advanced to its original position. When the pressure upon the key-arm is relieved, the lever J'' is lifted by the spring S, the pin p rising in the groove c , which is an arc drawn from the center of movement of the lever J'' . No movement of the bar R, therefore, takes place when the lever J'' rises. The key-arms F and F' are also restored to their former position by the operation of the spring S.

To insure that the pin p shall pursue the circuit of groove $c c'$, as described, the pin is flattened and obliquely placed on the lever J'' , and, if necessary, a spring, r , is so placed at the extremity of the throw as to give the pin its proper direction. These or other familiar devices for this purpose may be used.

The bar R is provided at its upper end with a head, R', which strikes the type-heads E and slides them successively upon the bed G.

The retreating movement of the bar R and the head R', above described, is to permit each successive type to rise, and during its retreat the types already in position upon the bed G are temporarily held there by a projecting arm, N, on the end of the rocking shaft M. This projection N bears against the edge of the type-head last pushed into place. When a succeeding type rises, it is thrown upward by the rising type-head, and again falls to hold this latter in place when the head R' shall have pushed it forward with those before it upon the bed G.

The arm N is supported in proper position by the head R', which is provided with a projection, i , for the purpose of continuing this support of N when the head is retreated. The bar M has also a longitudinal movement, whereby the arm N may be carried forward to finally sustain less than a full line.

As an auxiliary to the reciprocating bar R and head R', which push the type-head upon the supporting-bed G, I employ a rigid frame, O, secured to the bar R, and extending in

proximity to each and every one of the bars D and D', for the purpose of moving them forward simultaneously with the first forward movement of the type-head as it is pushed upon the bed G. This effect is produced by means of short pins u , projecting horizontally from the bars D and D' when the latter are at rest or not in use, but which assume a vertical position when said bars are rotated in setting the type. These pins are so placed with reference to the frame O that the frame will strike them at the same time that the head R' strikes the type-head E, and thus avoid bending the type-arms. I also employ an auxiliary device for lifting the type-heads into proper position to be moved forward upon the bed G, which consists of a lever, $l l'$, pivoted to a piece fixed to the bed on which the bar R runs at p' . The upper arm, l , of this lever is provided with a pin, p' , which runs in a grooved cam-piece, o , secured to the arm J'' , already described. The lower arm, l' , is forked, as shown in the detached view, Fig. 9.

The cam-groove is so constructed and arranged with reference to the pin p' that when the type-head has been raised by the key-arm nearly into position the lower arm, l' , of the forked lever rises beneath the type-head and lifts it to the proper height.

The arm l' is forked for the purpose of catching the type-head rising from either the right or left hand section of the machine.

For the purpose of properly spacing or regulating the distance between the words set up, and insuring at the same time lines of equal length, I employ expansible or compressible spaces attached to the arms in the position of types already described. These spaces consist of a V-shaped head formed of flat spring metal of proper width and about half the height of the type. More properly, their height may be described as being such that their bearing-point will be in the line of pressure between the gage I and the arm N, between which the type are finally held. Enough type being always set in a line to compress the spaces in some degree, the types will obviously form a compact line between I and N.

After using the line of type for any of the purposes suggested or hereinafter described, the same is distributed by first tilting the arm M' over into the position denoted by the dotted lines, Fig. 1, thus releasing the types from the arm N, and thereafter directing the pin p into the branch groove c'' by manipulation of the lever J'' . The type-heads may then be pushed off the supporting-guide G and allowed to drop downward into place. By making the table of proper inclination—say about twenty degrees—toward the operator, the parts being constructed with proper accuracy, the type-heads will by their own gravity slide off the support G. The force of gravity will also be sufficient to carry the ends v of the bars D back into the groove of the head T.

As a means for drawing the bars D' backward and upward and carrying their several

arms into the notches n' of the flanged plate C'' , I have provided the weighted levers W , pivoted at p'' , Figs. 2 and 5, the upper short arms of which are beveled on their upper curved end, as shown in Fig. 5. A pin, p''' , (more clearly shown in Fig. 2,) projecting from each arm D' , strikes the beveled top of the adjacent lever W near the point, and in rotating in obedience to the gravity of arm d' to a horizontal position said pin tilts the upper end of said weighted lever forward; but when said pin has reached a horizontal position it no longer bears against the beveled face, and the reaction of the lower or weighted end of the lever W serves to throw the bar D' upward, bringing its type-arm d' into its appropriate notch n' . When the type-line is in position upon the supporting-bed G , it may be inked and an impression taken from it on a sheet of paper, or an impression may be taken from it in wax or other suitable substance, to serve as a negative for an electrotype or other printing-plate, or to form a plate from which to print directly, according to the form of the type and the nature of the material.

I have chosen to herein show and describe a device for taking successive impressions in wax of any number of individual lines that may be successively set up. For this purpose A'' is a frame, hinged at a' to suitable standards rising from the back of the table already described, having the bed B' affixed thereto. Upon this bed I have arranged a removable sliding secondary bed-piece, B'' , upon which may be secured, in any suitable manner, a body of wax or other impressible substance.

The bed-piece B'' is moved by any proper mechanism or by hand. I have herein shown a long screw, S' , having a fixed position with reference to B' , and arranged to carry the sliding bed B'' by means of a clamp-nut or other equivalent device adapted to engage with the thread of the screw S' . The screw is rotated by means of the flexible crank C''' , having the pointed pin c''' projecting inwardly from its extremity.

D'' is a disk located about the shaft of the screw, near the flexible arm C''' , and fixed to the end of the bed B' , which disk has any desired number of holes in position to receive the pointed pin c''' . By these means the sliding bed B'' may be advanced any determinate distance required.

In operating my machine for the purpose of taking impressions in wax, the bed B'' is moved to the right to bring its left-hand end in proper position over the point of the table at which the type are set up. The first line of type being in place, the frame A'' is swung forward over the table, the line of type striking the wax and embedding itself therein. Suitable stops are provided on the table to strike the bed, or vice versa, to determine the depth of the impression. The impression-bed is then raised into its former position, the line of type is distributed, another is set up, the sliding bed is moved to the left by the screw S' the

proper distance to give the required space between the lines, another impression is made, and so on.

For the purpose of holding the line of type firmly in position and with their faces even while taking an impression from them, cross-bars B'' are fixed to the main bed B' , as shown in Fig. 7, on the faces of which cross-bars are secured the yielding rubber cushions R'' . When the frame bearing the impression-bed is tilted forward, one of these cross-bars falls on each side of and close to the type-heads, and rests by its cushioned face upon the type-arms near the heads. The pressure is only such as will be sufficient to hold the type-heads firmly upon the supporting-bed G , and not enough to bend the arms. The elasticity of the rubber will also operate to detach the type readily from the wax. Should the force required to make the impression be greater than can be conveniently applied directly by hand, any suitable form of clamping device may be used for the purpose. After taking all the impressions required, or for which there is room in the body of wax upon the sliding bed B'' , the latter is removed and another bed substituted in its place.

In arranging the types in the machine I propose to have reference somewhat to the thickness of such type, since the type-arms cannot be thicker than the types themselves. I propose, therefore, to place the thinner types nearest the center of the machine, where the arms to which they are attached, being the thinner, will also be the shorter, and therefore less liable to bend.

In order to place the type-mountings, composed of the rods D , arms d , and heads E , as near as possible to each other, I locate the knobs by which the key-arms are operated in the alternate relation shown in Fig. 1. I will locate all the corresponding types—as, for example, all the commas—in a group by themselves, and may think it desirable to indicate the types on the finger-knobs belonging to them. I have done this in Fig. 1. I may also think it desirable to make the knobs of alternating groups of types of different colors—as, for example, one group white and the next black.

I have estimated that a machine containing two hundred and eighty types and spaces, properly apportioned among the several capitals, small letters, figures, &c., will afford all the letters and characters required in setting any line of average book length. This would require the machine-table to be about forty inches long, the longest arms being eighteen and one-fourth inches, and the bars to which the arms are attached one-fourth inch apart.

It is obvious that by placing in each of the right and left hand sections a sufficient number of types two lines may be set up, one made up wholly from the types at the left and one from types at the right; but not more than two lines can be set in proper proximity. Two lines would be such a limited body of

types as would fall within the purpose of my following claims.

I claim—

1. In a machine for the purpose stated, the combination, with each other, of two or more type-mountings, composed each of the arm *d* and rod *D*, and having the offset *e* at the junction of the arm and rod, said rods *D* being arranged side by side, and having both rotary and longitudinal movement, and said arms being of unequal length, according to the distance of the respective rods apart, whereby said arms may be revolved into juxtaposition in a common plane to bring their types side by side in any desired order of arrangement, substantially as described.

2. In a machine for the purpose stated, the reciprocating bar *R*, having the head *R'*, in combination with the type-heads *E* and the composing-bed *G*, substantially as described.

3. In a machine for the purpose stated, the combination of the vibrating rod *M*, having the arm *N*, with the support *G*, stop *I*, and reciprocating bar *R'*, substantially as and for the purposes set forth.

4. The combination, with the type-head *E*, the reciprocating bar *R*, and the composing-bed *G*, of mechanism, substantially as described, whereby the bar *R* is thrown forward to carry the type-head upon the support when brought into place before it, being actuated at the proper moment through connection with the mechanism by which the type is brought into place, substantially as described.

5. In combination with the rod *D*, having the type-arm *d* and offset *e*, the pivoted arm *F*, provided with the inclined projection *g* and shoulder *g'*, arranged with reference to the offset *e* to first throw the rod *D* forward and then rotate the same and raise the type-arm, substantially as described.

6. In combination with the series of pivoted knob-arms *F*, adapted and arranged to actuate the several type-arms *d*, as described, and the rocking bar *J*, having attached thereto the lever *J''*, provided with the pin *p*, the cam-plate *K*, secured to the sliding bar *R*, and provided with the continuous groove *e e'*, substantially as and for the purpose stated.

7. In a machine for the purpose stated, the combination, with pivoted type-arms, mechanism, substantially as described, for raising said arms to bring the type up at a common point, and a composing-bed for the reception of the types after being so raised, of auxiliary lifting

mechanism adapted to engage the arms when nearly raised to the level of the bed, and to positively sustain the same at the level of the bed preparatory to their being moved forward thereon, substantially as described.

8. In combination with the type-arms *d d'* and composing-bed *G*, the lever *l l'* and arm *J''*, actuating said lever, substantially as and for the purposes set forth.

9. In a machine for the purpose stated, the two series of rods *D* and *D'*, located in different planes, and having their type-arms offset or bent at *e* and *e'* in opposite directions, said series being arranged to have their arms proximate and to lie in the same intermediate plane when raised, so as to bring their types into juxtaposition in a line, substantially as set forth.

10. In combination with the numerous rotating and longitudinally-moving rods *D*, having type-arms *d*, which depend in the same plane when at rest, the strip *T*, having a groove adapted to receive the squared ends *v* of the rods *D*, whereby said rods are held from rotating while being longitudinally moved, substantially as described, and for the purpose set forth.

11. In combination with the rods *D'*, having the pins *p'''*, of the upper inclined series of type-mountings shown, the weighted vibrating levers *W*, beveled on their upper arms, and operating, substantially as described, to draw the arms *d'* backward into the notches *n'*, when said arms have fallen to a perpendicular.

12. The pressure-bars *B'''*, in combination with the movable bed *B'* and type-arms *d*, substantially as and for the purpose set forth.

13. The combination, with the reciprocating bar *R* and rotating and longitudinally-moving rods *D D'*, provided with pins *u*, as shown, of the rigid frame *O*, extending in proximity to the several rods, substantially as described, and for the purpose stated.

14. In a machine for the purpose stated, the compressible space *P*, attached to the extremity of the type-arm *d*, in combination with the type-bearing arms and the bars *I*, *N*, and *B'''*, for locking the line, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

Witnesses: OLE M. PETERSON.

M. E. DAYTON,
JESSE COX, Jr.