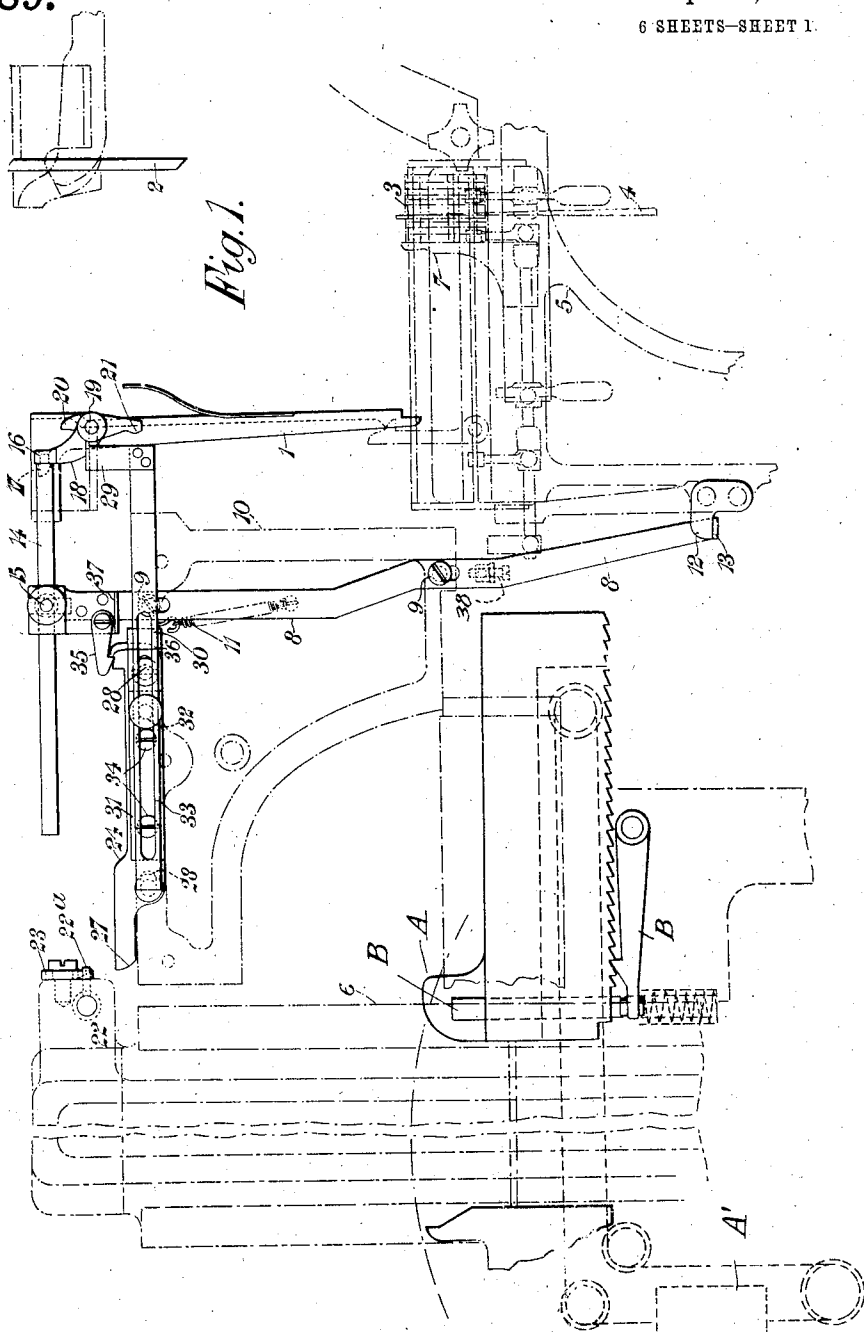


H. PEARCE & J. E. BILLINGTON.
QUADDING APPARATUS OF TYPOGRAPHICAL COMPOSING MACHINES.
APPLICATION FILED NOV. 1, 1909.

990,289.

Patented Apr. 25, 1911.

6 SHEETS—SHEET 1.



Witnesses
L. E. Harrison
W. H. H. H.

Inventors
Herbert Pearce
per J. E. Billington
Rogers & Kennedy Attorneys

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6 SHEETS—SHEET 2.

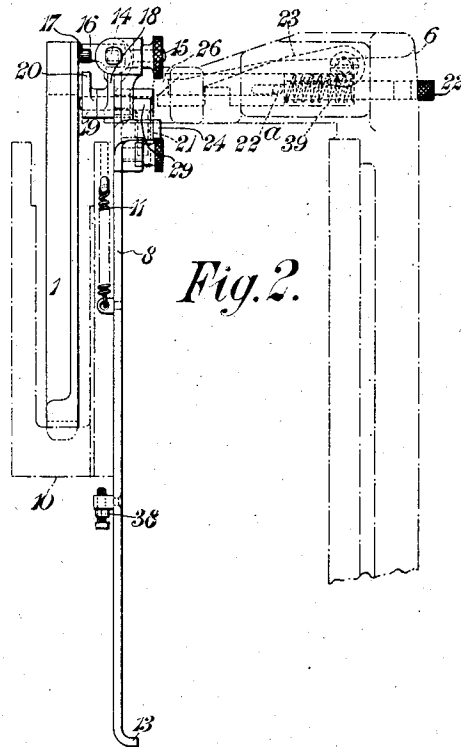


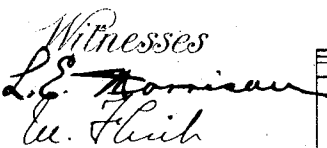
Fig. 2.

Witnesses
L. L. Morrison
W. H. Hark

Inventors
Herbert Pearce
J. E. Billington
per Rogers & Kennedy Attorneys.

990,289.

6 SHEETS—SHEET 3.



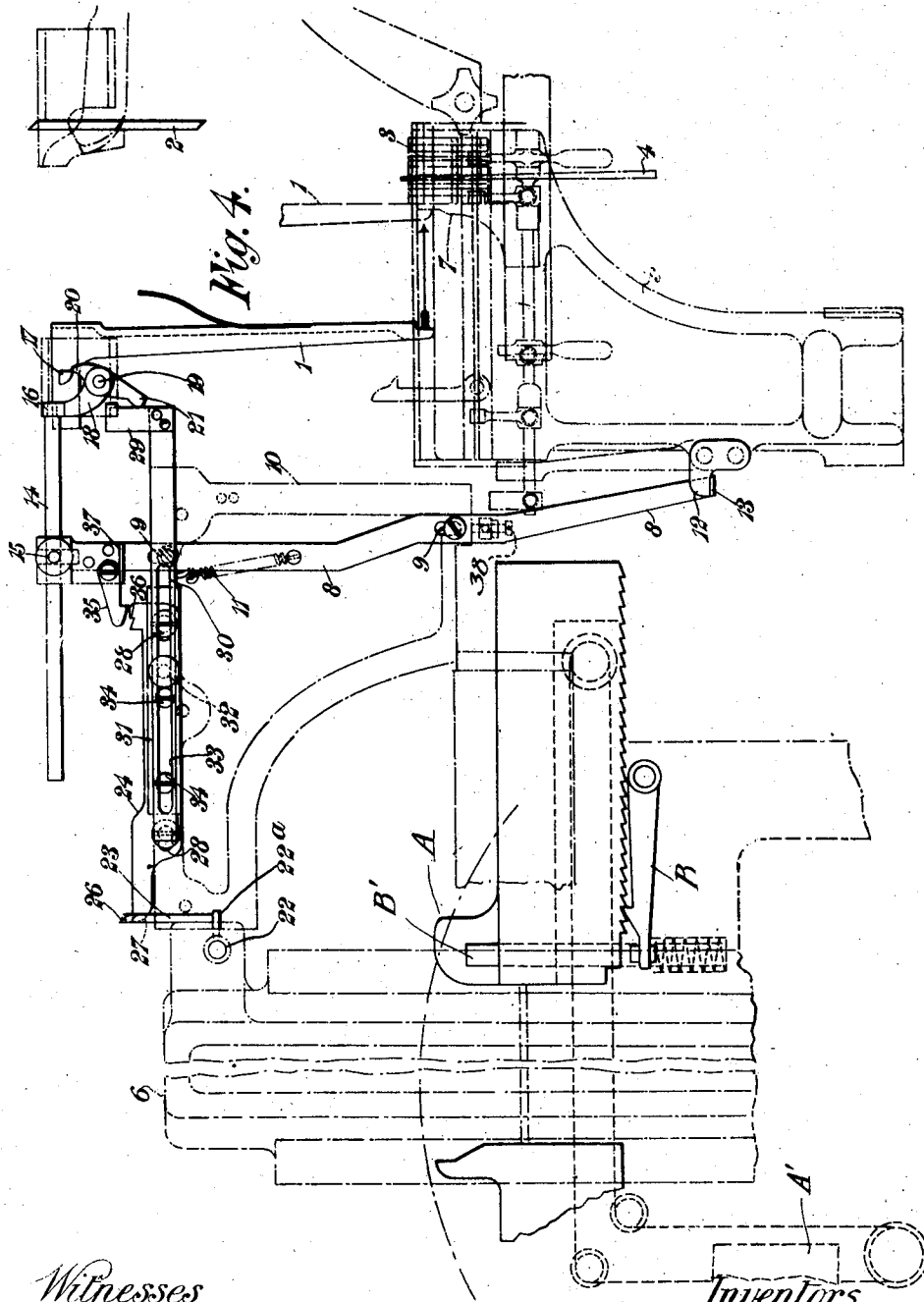
Inventors,
Herbert Pearce
J. E. Billington
per
Rogers & Kennedy Attorneys.

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6 SHEETS-SHEET 4.



Witnesses
L. E. Morrison
W. Fleish

Inventors
Herbert Pearce
J. E. Billington
 per *Rogers & Kennedy Attorneys*

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6 SHEETS—SHEET 5.

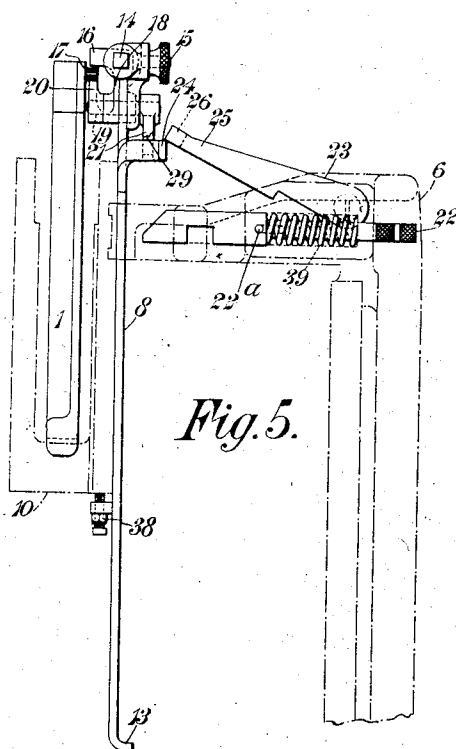


Fig. 5.

Witnesses
L. E. Morrison
W. F. Lusk

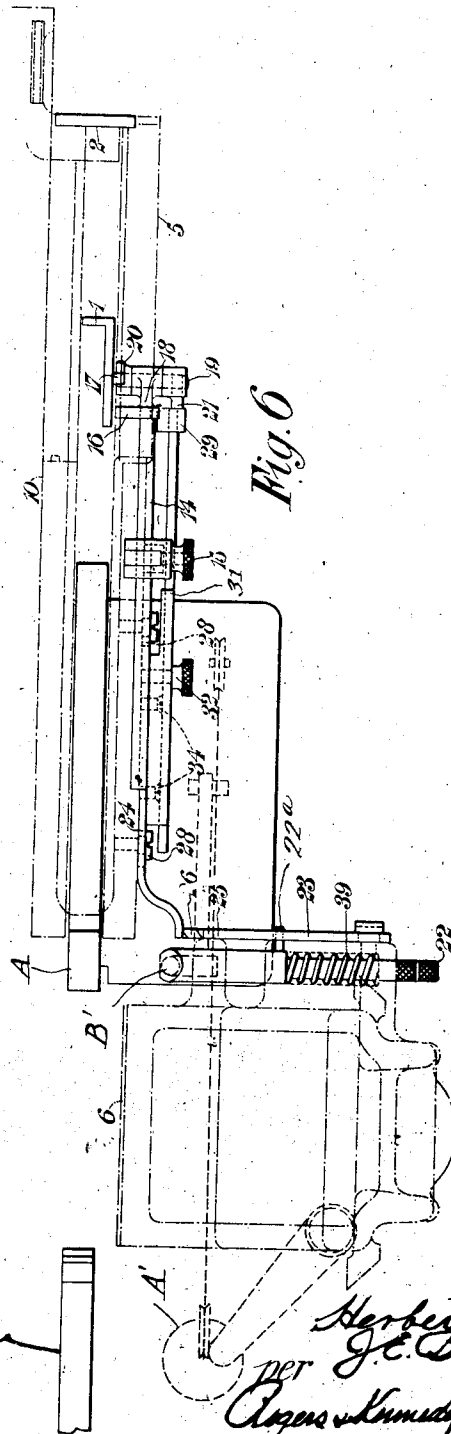
Inventors—
Herbert Pearce
J. E. Billington
per Rogers & Humedy Attorneys—

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6 SHEETS—SHEET 6.



Witnesses
L. C. Morrison
W. Fleish

Inventors
Herbert Pearce
J. E. Billington
per
Capers & Kennedy Attorneys—

UNITED STATES PATENT OFFICE.

HERBERT PEARCE AND JOHN ERNEST BILLINGTON, OF BROADHEATH, ENGLAND,
ASSIGNORS TO LINOTYPE AND MACHINERY LIMITED, OF LONDON, ENGLAND.

QUADDING APPARATUS OF TYPOGRAPHICAL COMPOSING-MACHINES.

990,289.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed November 1, 1909. Serial No. 525,717.

To all whom it may concern:

Be it known that we, HERBERT PEARCE and JOHN ERNEST BILLINGTON, subjects of the King of the United Kingdom of Great Britain and Ireland, and residing at Linotype and Machinery Works, Broadheath, in the county of Chester, England, have invented new and useful Improvements in the Quadding Apparatus of Typographical Composing-Machines, of which the following is a specification.

This invention relates to improvements in the quadding apparatus of typographical composing machines, and although it is specially applicable to the well-known linotype machine described in the specification of Letters Patent No. 436,532—in which connection, as a convenient example it is hereinafter described—it is to be understood that the invention is not limited to that particular application.

All quadding apparatus as heretofore suggested or constructed has, so far as we are aware, necessitated some act on the part of the operator, to make the said apparatus ready for quadding, the performance of this act causing a diversion of the operator's attention from the keyboard of the machine and thereby prejudicially affecting the output of such machine.

The object of the present invention is to provide quadding apparatus of typographical composing machines, with detector and releaser devices, the former endowed with a capacity for automatically detecting whether or not quadding is necessary, and the latter for automatically causing the quadding apparatus to effect any such quadding as may be so found to be necessary.

Quadding apparatus capable of attaining this result may be constructed in diverse ways, and that being so it will be understood that the invention is not limited to the arrangement hereinafter described and illustrated in the accompanying drawings, which arrangement is given merely as a convenient example.

In these drawings which are to be taken as part of this specification and read therewith:—Figure 1 is a front elevation of quadding apparatus constructed according to the present invention, with adjacent parts of a linotype machine represented in dot-and-dash lines; Fig. 2 is an elevation as seen

from the left-hand side of Fig. 1; Fig. 3 is a plan of Fig. 1; and Figs. 4, 5 and 6 are views respectively substantially similar to Figs. 1, 2 and 3 showing parts of the apparatus in positions differing from those in which they are respectively shown in those figures; and Figs. 7 and 8 are respectively a front elevation and a plan, showing, on an enlarged scale, an alternative or modified construction of a part of the apparatus shown in the other figures.

In the linotype machine as hitherto constructed, and, as represented in the accompanying drawings, there are provided what are known as two line-shifter fingers 1, 2, the function of which is to transfer the assembled or composed line of matrices 3 and space bars 4 from the assembler elevator 5 to the first elevator 6, the said assembled line being introduced between the shifter fingers 1, 2, by the ascent of the assembler elevator 5. The left-hand shifter finger 1, is adjustable relatively to the right-hand shifter finger 2, according to the length of line to be composed, and, during the composition of the line, the said finger 1 is temporarily locked in its leftmost position at a distance from the finger 2 approximately corresponding to this standard length of line, the release or unlocking of the left-hand shifter finger 1 being effected by the ascent of the assembler elevator 5. The composition of a line moves a line resistant 7 leftward toward the left-hand shifter finger 1, and when later, the said finger 1 is released, it is moved rightward up to the line resistant 7, as indicated by the arrow in Fig. 4, for the purpose of giving the necessary support to the matrices after they shall have been raised clear, and thereby been deprived of the support, of the line resistant 7.

According to the specification of Letters Patent 945,892, the just mentioned release of the left-hand shifter finger 1, is effected by means of a rod vertically slidable on the front of the matrix delivery channel, and raised by a spring and depressed by a projection or bracket fast to the assembler elevator, the said rod having adjustably secured to its upper end, a horizontal rod carrying a rearwardly-extending lug adapted to be moved into and out of the path of a stud on the left-hand shifter finger.

In the example illustrated in the accom-

panying drawings, devices similar to those mentioned in the last preceding paragraph are employed, 8 representing the vertical rod which, by two screws and slots 9, is held to the front of the matrix delivery channel casting 10 so as to be vertically movable thereon.

11 is the spring which raises the rod 8; 12 the bracket fast to the assembler elevator 5, which, by bearing on the forwardly-projecting lower end 13 of the rod 8, depresses the latter; 14 the horizontal rod which, by an eye bolt and nut or equivalent 15, is secured to the upper end of the vertical rod 8, with a capacity for horizontal adjustment therein, and 16 is the rearwardly-extending lug or stop adapted to be moved into and out of the path of the stud 17 fast to the left-hand shifter finger 1, which latter, in this example, is utilized in the capacity of the before mentioned detector.

According to the present invention, rightward travel of the detector 1, beyond a certain pre-determined limit, as hereinafter more particularly explained, is caused to impart motion to a releaser device which, in turn, effects the release of the quadding mechanism. In the arrangement illustrated, the releaser device comprises among other details, the horizontally adjustable rod 14; a downwardly-extending bearing bracket 18 rigidly secured to the right-hand end of the rod 14; a short rock shaft 19 turnable in the bracket 18; an upwardly-projecting lever arm 20 fast to the rear end of the shaft 19, and a downwardly-projecting lever arm 21 fast to the front end of the said shaft. The lever arm 20 is so arranged that when the horizontally adjustable rod 14, is raised to disengage its rearwardly-extending lug 16 from the stud 17 on the finger 1, it—the said arm—is moved into the rightward path of, and is struck by, the said stud, with the result that the downwardly projecting arm 21 is swung toward the left, as indicated in Fig. 4.

The left-hand face of the arm 20 is situated at a known distance from the engaging or left-hand face of the lug 16, this distance depending more or less upon the length of the composed line and the number of space bars 4 assumed to be inserted in such line; this arrangement of the composed line is purely an arbitrary matter and it is merely as a matter of convenience that it is herein assumed that the length of line is five inches and the number of space bars 4 inserted in that line is fifteen. On the assumption that these fifteen space bars are capable of expanding the line nine-sixteenths of an inch, this is the distance or substantially the distance between the before-mentioned left-hand faces of the arm 20 and lug 16 respectively. As, however, as hereinbefore stated, the said distance is dependent upon the

length of the composed line and the number of space bars 4 contained in such line, means may be provided whereby the said distance may be increased or decreased to suit composed lines of various lengths and composition; for instance, as hereinafter explained with reference to Figs. 7 and 8, the bearing bracket 18 may be adjustable so as to enable the rock shaft 19 to be moved laterally nearer to and farther from the vertical plane containing the left-hand face of the lug 16.

In the before mentioned Letters Patent 945,892 there has been described a means for effecting the release of the right-hand vise-jaw, the said means, among other devices, comprising:—(a) a bolt (corresponding to 22 in the accompanying drawings) slidable forward and backward on the first elevator 6 and which bolt effects the said release only when it is in its rearmost position, and (b) a latch (corresponding to 23 in the accompanying drawings) capable of retaining the bolt (22) in its foremost position, as when no quadding is necessary, and which latch engages a stud (22^a) fast to and projecting laterally from the bolt, and is manually disengaged from such stud to allow the bolt to assume its rearmost position for effecting the quadding.

In the specification of application for Letters Patent Serial Number 509843 there is described a means of effecting the disengagement of the latch or detent (23) from the stud (22^a) by means of a bar horizontally slidable on the front of the matrix delivery channel (10) and the right-hand end of which is acted upon by a cam on a vertically movable rod similar to the before-described rod 8. This cam serves to move the horizontally slidable bar leftward to bring its left-hand end beneath a rearward extension of the latch (23) so that, at the next descent of the first elevator (6), the latch is disengaged from the stud (22^a). At the next ensuing ascent of the first elevator (6) a cam surface on the just mentioned rearward extension moves the horizontally slidable bar rightward to its normal position.

According to the present invention a horizontally slidable bar 24, may be used (similarly to that before mentioned) for effecting the disengagement of the latch or detent 23 from the stud 22^a, the said latch, for this purpose, being provided with the rearward extension 25 with which the bar 24 engages, and the said bar may be returned to its normal position (as in the before mentioned arrangement) by a cam 26 on the rear end of the latch extension 25, which cam, during the ascent of the first elevator 6, engages with the curved end 27 of the bar 24. The bar 24 is slidably held to the front of the casting 10 by screw and slot connections 28. Unlike the former ar-

rangement however, the left-ward movement of the bar 24 is effected by the right-ward movement of the line-shifter finger 1, for which purpose it is preferred to provide the said bar with a rightward extension 29 adapted normally to bear against the bearing bracket 18, as shown in Figs. 1 and 3, and to be also acted upon by the before-described lever arm 21. The extension 29 is adjustably attached to the bar 24, conveniently by its horizontal slotted part 30 being guided thereon in a channel piece 31 and being made fast thereto in adjusted position by a screw 32 the stem of which passes through the slot 33 of the part 30 and screws into the bar 24. In the drawings, the channel piece 31 is represented as secured to the bar 24 by two screws 34, but this arrangement is adopted merely for convenience of manufacture and may be substituted by one in which the channel piece or the parallel members thereof is or are integral with the bar 24.

The vertically movable rod 8 has pivoted to it, a catch or detent 35 capable of engaging with a tooth 36 provided on the upper part or edge of the bar 24, for retaining the latter in its right-most position, as shown in Figs. 1 and 3. A rib 37 or other equivalent stop, fast to the rod 8, limits the downward pivotal movement of the detent 35 on the rod 8 as shown in Fig. 4, and when the bar 24 is moved to its right-most position the said detent automatically effects engagement with the tooth 36, this engagement ceasing when the ascent of the rod 8 raises the detent sufficiently, that is to say, to the height in which it is represented in Fig. 4.

The rod 8 is preferably provided with an adjustable stop 38 adapted to contact with the lower part of the casting 10, for limiting the upward movement of the said rod to the extent necessary for allowing the stud 17 to become disengaged from the lever arm 20 as soon as the rock shaft 19 has been turned sufficiently to effect the full leftward movement of the bar 24.

When a line which has been composed and is then standing in the assembler elevator 5, is of standard length or approximately so, the line resistant 7 is in contact with, or close to the left-hand shifter finger 1, so that, when the elevator 5 is raised and, in consequence thereof, through the spring 11, rods 8 and 14, and lug 16, the finger 1 is released, the said finger will either have no rightward travel at all, or so little as, in its capacity of detector, to have no effect upon the horizontally slidable bar 24. When, however, the composed line falls short of the standard length by an appreciable extent, as shown, for example in Figs. 1 and 4, the finger 1 has longer to travel before it reaches the line resistant 7 and by this

longer travel, and through the releaser devices, effects the release of the quadding mechanism, the engagement of the lug 17 with the lever arm 20 effecting the turning of the rock shaft 19 to an extent sufficient to move the bar 24 leftward, as indicated in Fig. 4, so that when the first elevator 6 next descends to present the composed line in front of the casting mold, the latch 23 will be disengaged from the bolt 22, which, through its spring 39, will be projected rearward and thereby caused to release the right-hand vise jaw to enable it to effect the necessary quadding movement.

In the before mentioned adjustable devices represented in Figs. 7 and 8, the bracket 18, instead of being rigidly secured to the rod 14, and formed integral with the lug 16, as in the before described example, is fitted to the said rod by means of a collar or sleeve 40, formed independently of the lug 16 which latter is itself directly riveted or otherwise rigidly attached to the end of the said rod.

The sleeve 40 is capable of being moved along the rod 14 so as to enable the before mentioned distance between the left-hand faces of the arm 20 and lug 16 to be varied for the purpose previously explained, and when its position on the rod has been decided upon it may be secured in such position by means of a pinching screw 41.

For the purpose of defining certain elements as referred to in the claims, the "quadding" mechanism properly speaking comprises the movable jaw A and the means for closing it in upon the short line when in the casting position, these means being substantially the same as those set forth in the previously mentioned Letters Patent No. 945,892, and partially represented herein and indicated by the letter of reference A' (see Figs. 1, 3, 4 and 6). The releasing mechanism or releaser comprises the spring-actuated detent B, which holds the jaw A in its normal position, the rod or piece B' which acts upon the detent B, and the previously described bolt 22, mounted and arranged so that in the event of a full line being presented, it is held in the position shown in Fig. 3 and does not actuate the rod B'; but in the event of a short line being presented, and through the connections to the detector as previously explained, it assumes the position shown in Fig. 6, so that in the further operation of the machine it will act upon and depress the rod B' and thus trip the detent B, permitting the jaw A to close in upon the short line presented to the casting position.

We claim:—

1. In a typographical composing machine, the combination with quadding mechanism, of a detector adapted to automatically detect whether or not quadding is necessary, and a

releaser adapted to retain the quadding mechanism out of operation and to automatically release it when quadding is so found to be necessary.

2. In a typographical composing machine, the combination with quadding mechanism, of a detector adapted to automatically detect whether or not quadding is necessary, and a releaser cooperating with the detector adapted to retain the quadding mechanism out of operation and adapted by the said cooperation to automatically release the quadding mechanism when quadding is so found to be necessary.
3. In a typographical composing machine, the combination with quadding mechanism and with the left-hand line shifter finger, of a releaser cooperating with the said finger adapted to retain the quadding mechanism out of operation and adapted by the said cooperation to release the quadding mechanism.
4. In a typographical composing machine, the combination with quadding mechanism and with the left-hand line shifter finger, of a releaser cooperating with the said finger adapted to retain the quadding mechanism out of operation and adapted by the rightward movement of such finger to release the quadding mechanism.
5. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of a detector adapted to automatically detect whether or not quadding is necessary, and devices operatively connecting the detector and detent, and adapted to automatically release the detent when the detector detects the necessity for quadding.
6. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, and an adjustable bar adapted in one position to release the detent, of a detector adapted to automatically detect whether or not quadding is necessary, and devices operatively connecting the detector and the adjustable bar, and adapted to move the latter into its detent-releasing position when the detector detects the necessity for quadding.
7. In a typographical composing machine, the combination of quadding mechanism having a detent adapted to retain it out of operation, an adjustable bar adapted in one position to release the detent, a movable detector the extent of whose movement in one direction serves to indicate whether or not quadding is necessary, and devices operatively connecting the detector and the adjustable bar, and adapted to move the latter oppositely to the detector, into its detent-releasing position when the detector detects the necessity for quadding.
8. In a typographical composing machine, the combination of quadding mechanism

having a detent adapted to retain it out of operation, an adjustable extensible bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary, a stop adapted to arrest the detector, means operatively connected with the stop adapted to disengage it from the detector, and lever devices operatively connected with the stop and adapted to be moved by the detector and to move the bar into its detent-releasing position.

9. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of an adjustable bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary, a stop adapted to arrest the detector, means operatively connected with the stop adapted to disengage it from the detector, lever devices operatively connected with the stop and adapted to be moved by the detector and to move the bar into its detent-releasing position, a tooth on the adjustable bar, and a detent operatively connected with the aforesaid means adapted to engage the tooth, to retain the bar in position.

10. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of a movable bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary, a stud fast to the detector, a stop movable into and out of the path of the stud, a rock shaft operatively connected with the stop, and lever arms on the shaft, one adapted to be struck by the stud and the other adapted to move the bar into its detent-releasing position.

11. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of a movable bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary, a stud fast to the detector, a stop movable into and out of the path of the stud, a rock shaft operatively connected with the stop, means adapted to adjust the rock shaft relatively to the stop, and lever arms on the shaft, adapted one to be struck by the stud, and the other to move the bar into its detent-releasing position.

12. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of a movable bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary,

a stud fast to the detector, a stop movable into and out of the path of the stud, a rod fast to the stop, a bracket adjustable on the rod, a rock shaft turnable in the bracket, lever arms on the shaft, one of which is adapted to be struck by the stud, and an extension operatively connected with the movable bar, adapted to be moved by the other lever arm.

13. In a typographical composing machine, the combination with quadding mechanism having a detent adapted to retain it out of operation, of a movable bar adapted, in one position, to release the detent, a movable detector adapted to automatically detect whether or not quadding is necessary, a stud fast to the detector, a stop movable into and out of the path of the stud, a rod fast to the stop, a bracket adjustable on the rod, a rock shaft turnable in the bracket, lever arms on the shaft, one of which is adapted to be struck by the stud, an extension adjustable on the movable bar, adapted to be moved by the other lever arm, a tooth on the movable bar, and a detent operatively connected with the rod, adapted to engage the tooth, to retain the bar in position.

14. In a typographical composing machine, the combination with quadding mechanism of independent automatic means for detecting a shortness in the line and throwing the quadding mechanism into and out of action.

15. In a typographical composing machine, the combination with quadding mechanism, of independent automatic means for detecting a shortness in the line and connections for throwing the quadding mechanism into and out of action.

16. In a typographical composing machine, the combination with quadding mechanism and assembling devices, of automatic means for detecting a shortness in the line

during assemblage and for throwing the quadding mechanism into and out of action.

17. In a typographical composing machine, the combination with quadding mechanism and assembling devices, of automatic means for detecting a shortness in the line during assemblage and connections therefrom for controlling the action of the quadding mechanism.

18. In a typographical composing machine, the combination of a movable vise jaw, and independent automatic means for detecting a shortness in the line and for controlling the movements of the vise jaw.

19. In a typographical composing machine, the combination of a movable vise jaw, and independent automatic means for detecting a shortness in the line and connections therefrom to control the movements of the vise jaw.

20. In a typographical composing machine, the combination of quadding mechanism comprising a movable vise jaw, and assembling devices, with automatic means for detecting a shortness in the line during assemblage and for controlling the movements of the vise jaw.

21. In a typographical composing machine, the combination of quadding mechanism comprising a movable jaw, and assembling devices, with automatic means for detecting a shortness in the line during assemblage and connections therefrom for controlling the movements of the vise jaw.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

HERBERT PEARCE.

JOHN ERNEST BILLINGTON.

Witnesses:

ROBERT BRIGGS,

HAROLD SOUTHWORTH.