

[54] CHANGEABLE TYPE HEAD

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[58] **Field of Search**..... **197/17, 35-37; 403/361, 374**

[56] References Cited

UNITED STATES PATENTS

265,747	10/1882	Briggs	403/374
1,206,972	12/1916	Anderson.....	197/36
2,171,470	8/1939	Munoz	197/36
2,862,592	12/1958	Redmond.....	197/36
3,263,792	8/1966	Snyder	197/36
3,308,916	3/1967	Canny et al.....	197/36

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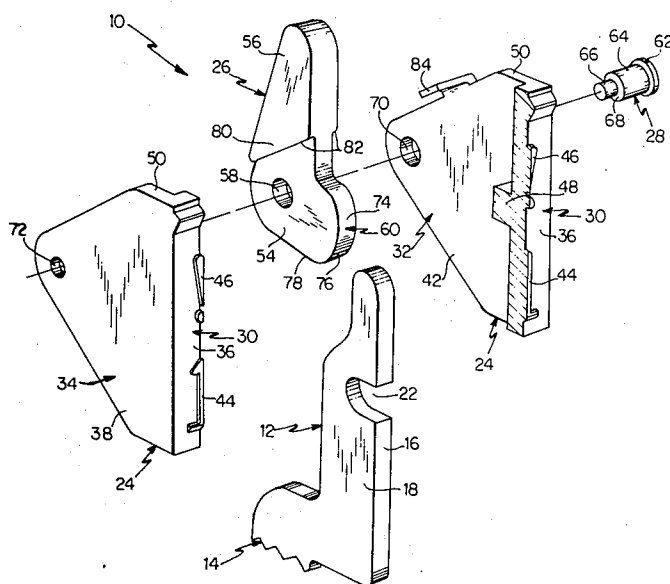
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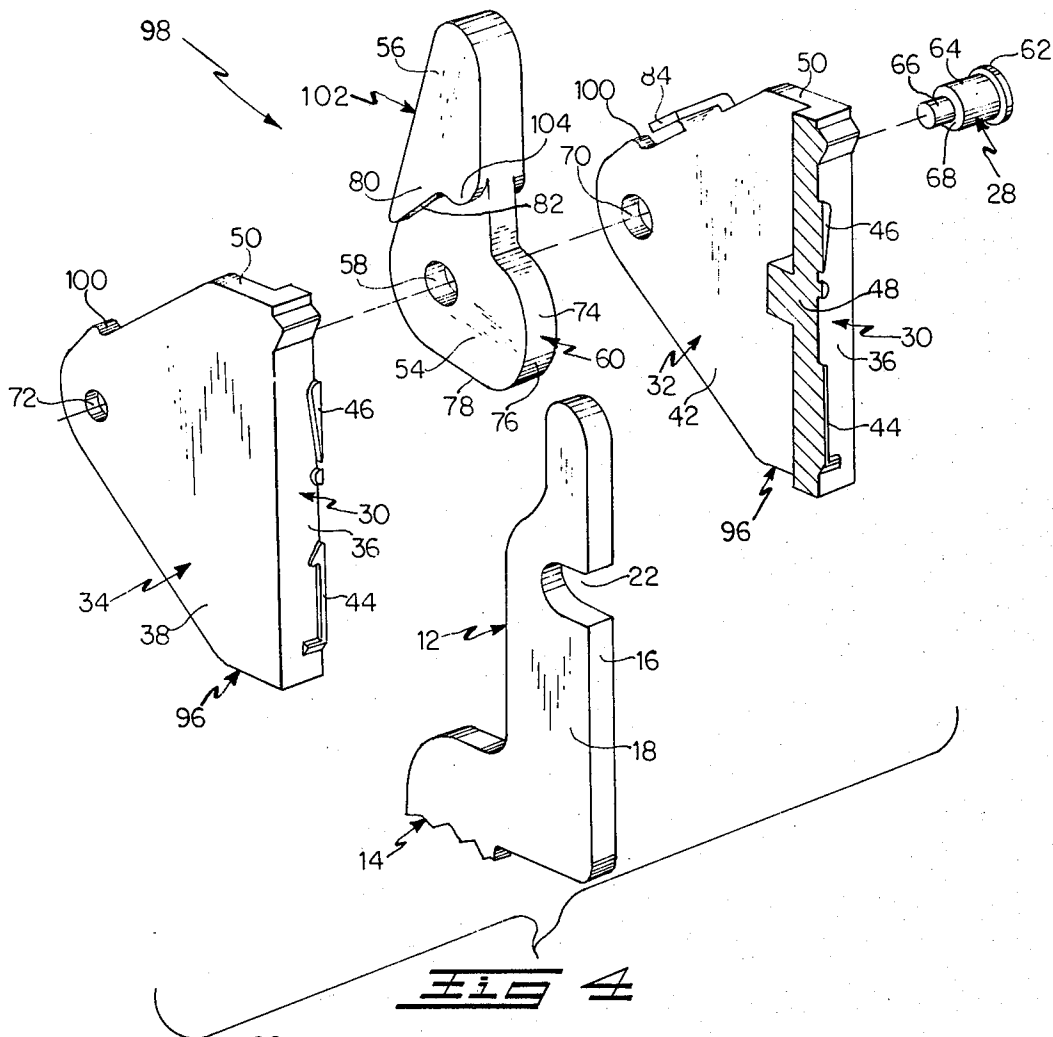
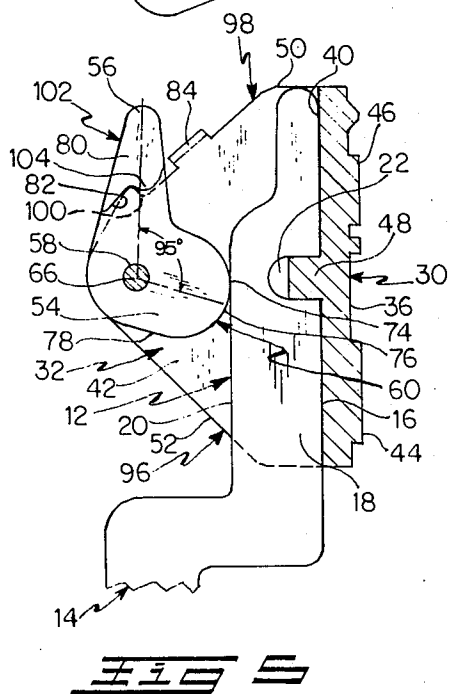
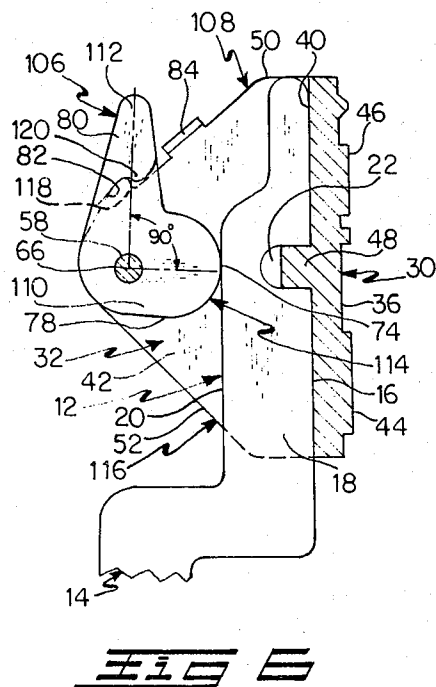
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ABSTRACT

A changeable type head is provided that can be positively locked on a typebar of a typing machine. The changeable type head includes a U-shaped body portion adapted to envelop the rear and side surfaces of the typebar. A lug in the apex of the U-shaped body portion seats in a notch in the rear surface of the typebar. Cooperating with the lug and mating notch is a lever pivotally mounted between the side walls of the U-shaped body portion. The lever has a handle and a cam surface that presses the typebar against the apex of the U when the lever is in a lock position as indicated by upward projection of the handle. The U-shaped body portion is triangular-shaped as viewed from the side to reduce moments of force upon impact of a type character.

7 Claims, 6 Drawing Figures





CHANGEABLE TYPE HEAD

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to changeable type heads for typing machines and more particularly to an improved changeable type head that can be locked on the end of a typebar better than prior changeable type heads.

2. Description of the Prior Art

Prior changeable type heads have exhibited a number of disadvantages, the most noticeable of which is the tendency to tilt upon impact of a type character and type a trace of another type character. In addition, the parts rapidly wear out, and after a short time the line of write changes so that the changeable type head type characters are out of line with the fixed type head type characters.

SUMMARY OF THE INVENTION

It is therefore a primary object of the invention to provide an improved changeable type head that will not tilt upon impact of a type character thus preventing typing of a trace of an additional type character.

Another object of the invention is to provide a changeable type head in accordance with the foregoing object in which the changeable type head is shaped to reduce moments of force upon impact of a type character thus further reducing the tendency to tilt.

Another object of the invention is to provide a changeable type head in accordance with the foregoing objects in which the changeable type head is composed of materials and designed to go through many typing cycles without substantial wear of the parts.

Another object of the invention is to provide a changeable type head in accordance with the foregoing objects in which the changeable type head will maintain the same line of write through many typing cycles.

Another object of the invention is to provide a changeable type head in accordance with the foregoing objects in which the changeable type head has very few parts and can easily be positively locked on the typebar without the use of a tool.

Another object of the invention is to provide a changeable type head in accordance with the foregoing objects in which the changeable type head is designed especially to resist the tendency to ride up on a typebar during impact.

Another object of the invention is to provide a changeable type head in accordance with the foregoing objects in which the changeable type head is substantially as wide as conventional fixed type heads so that a typebar carrying the changeable type head can occupy any position on a typebar segment in a typing machine.

In order to accomplish the objects of the invention, a changeable type head is provided that includes a body portion, a lever, and a rivet to pivotally connect the lever to the body portion. The body portion is U-shaped to envelop the rear and side surfaces of the distal end portion of a typebar. The distal end portion of the typebar has a notch in the rear surface, and the U-shaped body portion has a lug in the apex of the U to seat in the notch in the typebar. The lever has a handle and a cam end with a cam surface that bears against the front surface of the distal end portion of the typebar to press the rear surface of the distal end portion of the

typebar against the apex of the U when the lever is in a lock position as indicated by upward projection of the handle. The lock position of the cam surface provides a very positive lock to lock the changeable type head on the typebar without tilting upon impact of a type character, and the lug and mating notch physically block longitudinal movement of the changeable type head on the typebar. In addition, the body portion is triangular-shaped to reduce moments of force upon impact of a type character and thus further reduce the tendency to tilt.

In some embodiments of the invention, the cam surface on the lever has an overcenter position that presses against the front surface of the distal end portion of the typebar even more than does the lock position. Thus when the lever is in the lock position and the changeable type head tries to ride off the distal end portion of the typebar during impacts of the type characters, the press will increase. In other embodiments of the invention, the lever has a latch to assist in locking the lever in the lock position. The changeable type head is composed of materials and designed to be especially resistant to wear, and it is no wider than conventional fixed type heads so that it can occupy any position in a typing machine.

Other objects and a fuller understanding of the invention can be had by referring to the description of the preferred embodiments and the claims taken in conjunction with the accompanying drawing as hereinafter described.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an exploded perspective rear view of a changeable type head incorporating a first embodiment of the invention with an overcenter lever.

FIG. 2 is a section view taken substantially along the interior surface of one of the side walls of the changeable type head of FIG. 1 looking inward.

FIG. 3 is a section view similar to FIG. 2 of a second embodiment of the invention with a substantially perpendicular lever.

FIG. 4 is an exploded perspective rear view of a changeable type head incorporating a third embodiment of the invention with an overcenter lever and a latch.

FIG. 5 is a section view taken substantially along the interior surface of one of the side walls of the changeable type head of FIG. 4 looking inward.

FIG. 6 is a section view similar to FIG. 5 of a fourth embodiment of the invention with a substantially perpendicular lever and a latch.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawing, a first embodiment of the invention is shown in FIGS. 1 and 2. The first embodiment of the invention includes a changeable type head 10 that can be removably mounted on a distal end portion 12 of a typebar 14 of a typing machine such as a typewriter. The changeable type head 10 can of course also be used with any typing machine having a typebar 14 such as printers for computers, adding machines, and cash registers, for example.

The distal end portion 12 of the typebar 14 has a rear surface 16, two side surfaces 18, and a front surface 20. A recess or notch 22 is formed in the rear surface 16 of the distal end portion 12 of the typebar 14.

The changeable type head 10 includes a body portion 24, a lever 26, and a pivot in the form of a rivet 28 to pivotally mount the lever 26 on the body portion 24. The body portion 24 of the changeable type head 10 is U-shaped with a rear wall 30 and two side walls 32 and 34. The rear wall 30 and each of the side walls 32 and 34 has an exterior surface 36 and 38 respectively and an interior surface 40 and 42 respectively. Formed on the exterior surface 36 of the rear wall 30, or rear exterior surface 36 of the body portion 24, are a lower case type character 44 and an upper case type character 46.

The interior surfaces 40 and 42 of the rear and side walls 30, 32, and 34 serve as means for receiving the distal end portion 12 of the typebar 14. A lug 48 is formed on the interior surface 40 of the rear wall 30 of the body portion 24 to mate with the notch 22 in the rear surface 16 of the distal end portion 12 of the typebar 14. The lug 48 and mating notch 22 serve as means for blocking the changeable type head 10 against movement in a longitudinal direction on the typebar 14. Of course the lug 48 and mating notch 22 could be oriented differently between the typebar 14 and the body portion 24 of the changeable type head 10, or they could be reversed with the lug 48 on the typebar 14 and the mating notch 22 on the body portion 24.

Each of the side walls 32 and 34 of the body portion 24 of the changeable type head 10 also has a top surface 50 and a bottom surface 52. The top and bottom surfaces 50 and 52 of the side walls 32 and 34 tend to converge away from the rear exterior surface 36 of the body portion 24 making the body portion 24 triangular-shaped as viewed from the side. The triangular-shaped body portion 24 reduces moments of force upon impact of one of the type characters 44 or 46 to prevent tilting of the changeable type head 10 so that a trace of the other type character 46 or 44 will not also be typed.

In contrast to the body portion 24 of the changeable type head 10 which is composed of a metal or other suitable material, the lever 26 can be composed of a plastic such as forty percent glass-reinforced nylon. Forty percent glass-reinforced nylon is especially resistant to wear; however other plastics could also be used. The lever 26 includes a cam end 54 and means for pivoting the lever in the form of a handle 56 with a transverse hole 58 between the cam end 54 and the handle 56. A cam surface 60 is formed on the cam end 54 of the lever 26.

The lever 26 is pivotally mounted between the interior surfaces 42 of the side walls 32 and 34 of the body portion 24 of the changeable type head 10 by the rivet 28. The rivet 28 has a head 62, a collar 64, and a nose 66. Formed between the collar 64 and the nose 66 is a shoulder 68. The collar 64 of the rivet 28 extends through a hole 70 in one of the side walls 32 of the body portion 24 and through the transverse hole 58 in the lever 26. The shoulder 68 of the rivet 28 abuts the interior surface 42 of the other side wall 34, while the nose 66 of the rivet 28 extends through a small hole 72 in that side wall 34. The small hole 72 is smaller than the hole 70 in the side wall 32. In assembly the nose 66 of the rivet 28 is flattened in a conventional manner to form a second head, which is not shown, to prevent the rivet 28 from coming off of the body portion 24. The shoulder 68 on the rivet 28 prevents the side walls 32 and 34 of the body portion 24 from being bent together when the nose 66 of the rivet 28 is flattened.

The cam surface 60 on the lever 26 has a lock surface 74, an overcenter surface 76, and a release surface 78.

The overcenter surface 76 on the lever 26 is farther from the axis of the rivet 28 than is the lock surface 74, and the lock surface 74 is farther from the axis of the rivet 28 than is the release surface 78. Lock, overcenter, and release positions of the lever 26 are determined by which surface 74, 76, or 78 is closest to the front surface 20 of the distal end portion 12 of the typebar 14.

Overlapping the side walls 32 and 34 of the body portion 24 are portions 80 of the handle 56 with shoulders 82 overlapping the top surfaces 50 of the side walls 32 and 34. The shoulders 82 are means for stopping pivotal movement of the lever 26 farther away from the release position when the lever 26 is in the lock position. When the lever 26 is in the lock position, the handle 56 extends upward substantially parallel to the distal end portion 12 of the typebar 14. Of course the handle 56 could be formed to extend in some other direction such as downward when the lever 26 is in the lock position.

In the first embodiment of the invention, the cam end 54 of the lever 26 and handle 56 form an obtuse angle of approximately 95° so that the overcenter surface 76 on the lever 26 presses against the front surface 20 of the distal end portion 12 of the typebar 14 even more than the lock surface 74 presses when the lever 26 is in the lock position to provide an overcenter effect. Thus as the changeable type head 10 tends to ride off the distal end portion 12 of the typebar 14 during impacts of the type characters 44 and 46, the changeable type head 10 is actually held tighter on the typebar 14. When the lever 26 is in the lock position, the cam end 54 of the lever 26 is compressed between 0.0005 and 0.0125 of an inch. The lock surface 74 on the lever 26 and the lug 48 on the body portion 24 mating with the notch 22 in the typebar 14 combine to form a very positive lock of the changeable type head 10 on the typebar 14. The positive lock prevents tilting upon impact of one of the type characters 44 or 46 that causes typing of a trace of the other type character 46 or 44. The changeable type head 10 can be locked on the typebar 14 and removed from the typebar 14 without the use of a tool, and the exterior surfaces 38 of the side walls 32 and 34 are substantially the same distance apart as the exterior surfaces of the sides of conventional fixed type heads. Therefore the changeable type head 10 can be used in any position in the typing machine that a fixed type head can be used.

A bracket 84 extends from the top surface 50 of one of the side walls 32 across the distance between the interior surfaces 42 of the side walls 32 and 34 to prevent any attempt to install the changeable type head 10 upside down. The bracket 84 can be merely an extension of one of the side walls 32 that is bent approximately 90°.

Turning now to FIG. 3, a second embodiment of the invention is shown. The second embodiment is exactly like the first embodiment except that the second embodiment has a lever 86 on a changeable type head 88 with a cam end 90 and a handle 92 at an angle of 90° instead of the approximately 95° in the first embodiment and the second embodiment has a cam surface 94 on the cam end 90 of the lever 86 without the overcenter position of the first embodiment. All of the other parts and reference numerals are the same in both the first and second embodiments. The lug 48 on the body portion 24 and the mating notch 22 in the distal end portion 12 of the typebar 14 in cooperation with the

lock position of the lever 86 are enough to prevent the changeable type head 88 from riding off the distal end portion 12 of the typebar 14 during impacts of the type characters 44 and 46.

With reference to FIGS. 4 and 5, a third embodiment of the invention is shown. The third embodiment is exactly like the first embodiment except that a body portion 96 of a changeable type head 98 has recesses 100 in the top surfaces 50 of the side walls 32 and 34 and the stops or shoulders 82 on a lever 102 have latches 104 to mate with the recesses 100 in the body portion 96 to provide means for latching the cam surface 60 on the lever 102 in the lock position. All of the other parts and reference numerals are the same in both the first and third embodiments.

In FIG. 6, a fourth embodiment of the invention is shown. The fourth embodiment is exactly like the first embodiment except that it combines the features of both the second and third embodiments. As in the second embodiment, the fourth embodiment has a lever 106 on a changeable type head 108 with a cam end 110 and a handle 112 at an angle of ninety degrees instead of the approximately 95° in the first and third embodiments and the fourth embodiment has a cam surface 114 on the cam end 110 of the lever 106 without the overcenter position of the first and third embodiments. In addition, as in the third embodiment, the fourth embodiment has a body portion 116 with recesses 118 in the top surfaces 50 of the side walls 32 and 34 and the stops or shoulders 82 on the lever 106 have latches 120 to mate with the recesses 118 in the body portion 116 to provide means for latching the cam surface 114 on the lever 106 in the lock position. All of the other parts and reference numerals are the same in both the first and fourth embodiments.

In operation, in all four embodiments of the invention the changeable type head 10, 88, 98, or 108 is assembled to and disassembled from the typebar 14 in substantially the same manner. In assembly, the handle 56, 92, or 112 of the lever 26, 86, 102 or 106 is pivoted downward if it is not already down to place the lever 26, 86, 102, or 106 in the release position. The body portion 24, 96, or 116 of the changeable type head 10, 88, 98, or 108 is then placed over the distal end portion 12 of the typebar 14 with the lug 48 on the interior surface 40 of the rear wall 30 of the body portion 24, 96, or 116 positioned to mate with the notch 22 in the distal end portion 12 of the typebar 14. The bracket 84 on the top surface 50 of one of the side walls 32 of the body portion 24, 96, or 116 prevents installation of the changeable type head 10, 88, 98, or 108 upside down. The lug 48 on the body portion 24, 96, 116 is then seated in the notch 22 in the typebar 14, and the handle 56, 92, or 112 is pivoted upward until the lever 26, 86, 102 or 106 is in the lock position with the lock surface 74 pressing against the front surface 20 of the distal end portion 12 of the typebar 14 at which time the handle 56, 92, or 112 will be substantially parallel to the distal end portion 12 of the typebar 14. The shoulders 82 on the handle 56, 92, or 112 prevent the lever 26, 86, 102 or 106 from being pivoted any farther away from the release position.

In the first and third embodiments of the invention, the lever 26 is pivoted overcenter past the overcenter position. In the overcenter position the lever 26 actually presses against the front surface 20 of the distal end portion 12 of the typebar 14 harder than when in the lock position to cause the press to increase as the

changeable type head 10 or 98 tends to ride off the distal end portion 12 of the typebar 14 during impacts of the type characters 44 and 46. In the third and fourth embodiments of the invention, the latches 104 or 120 on the shoulders 82 on the handle 56 or 112 seat in the recesses 100 or 118 in the top surfaces 50 of the side walls 32 and 34 of the body portion 96 or 116 to further lock the lever 102 or 106 into the lock position.

In all four embodiments of the invention, the lock position of the lever 26, 86, 102, or 106 provides a very positive lock of the changeable type head 10, 88, 98, or 108 on the typebar 14 so that upon impact of one of the type characters 44 or 46 a trace of the other type character 46 or 44 will not also be typed because of tilting of the changeable type head 10, 88, 98, or 108. In addition, the triangular-shaped body portion 24, 96, or 116 reduces moments of force upon impacts of the type characters 44 and 46 to further reduce the tendency to tilt upon impact of one of the type characters 44 or 46. In order to physically block longitudinal movement of the changeable type head 10, 88, or 108 on the typebar 14, the lug 48 on the body portion 24, 96, or 116 of the changeable type head 10, 88, 98, or 108 seats in the notch 22 in the typebar 14.

In disassembly, the assembly steps are simply reversed. The handle 56, 92, or 112 of the lever 26, 86, 102 or 106 is pivoted downward until the lever 26, 86, 102 or 106 is in the release position whereupon the changeable type head 10, 88, 98, or 108 can be removed from the typebar 14 and replaced by another changeable type head 10, 88, 98, or 108 with different type characters 44 and 46 if desired. The changeable type head 10, 88, 98, or 108 can have as few as two or three separate parts, and the parts are composed of materials and designed especially to resist wear. The exterior surfaces 38 of the side walls 32 and 34 of the changeable type head 10, 88, 98, or 108 are substantially the same distance apart as the exterior surfaces of conventional fixed type heads. Therefore the changeable type head 10, 88, 98, or 108 can be used in any position in the typing machine that a fixed type head can be used.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made by way of example and that numerous changes in the details of construction and the combination and arrangement of parts can be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

Having thus set forth the nature of the invention what is claimed is:

1. In a changeable type head of the type having rear and side walls for enveloping rear and side surfaces, respectively, of a typebar; at least one type character on an exterior surface of the rear wall of the changeable type head; and means for blocking longitudinal movement of the changeable type head on the typebar; the improvement comprising, in combination:

- a. a pivot spanning the side walls of the changeable type head, substantially perpendicular to the side walls, and in front of the typebar;
- b. a lever on the pivot;
- c. a lock surface on the lever, the lock surface farther than a mating front surface of the typebar from the pivot when the typebar is against the rear wall of the changeable type head;

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- d. a release surface on the lever, the release surface closer than the mating front surface of the typebar to the pivot when the typebar is against the rear wall of the changeable type head; and
- e. a handle on an opposite end of the lever from the lock surface for pivoting the lever so that the lock surface faces the typebar to lock the changeable type head on the typebar in cooperation with the blocking means and for pivoting the lever so that the release surface faces the typebar to release the changeable type head from the typebar; and
- f. an overcenter surface on the lever, the overcenter surface farther than the lock surface from the pivot and located between the release and lock surface to provide an overcenter effect.
2. The changeable type head of claim 1, in which the lever is composed of a plastic.
3. The changeable type head of claim 1, in which top and bottom surfaces of the side walls of the changeable

type head taper toward the front of the changeable type head.

4. The changeable type head of claim 3, further comprising:

f. means for stopping movement of the release surface on the lever away from the typebar when the lock surface faces the typebar.

5. The changeable type head of claim 4, in which the stopping means includes a portion of the handle that overlaps at least one of the side walls.

6. The changeable type head of claim 3, further comprising:

f. means for latching the lever when the lock surface faces the typebar to prevent pivotal movement of the lever.

7. The changeable type head of claim 6, in which the latching means includes a latch on the handle and a mating recess in at least one of the side walls.

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