

(No Model.)

C. HOLLIWELL.

KNIFE FOR TRIMMING TYPE, PRINTING BARS, &c.

No. 560,000.

Patented May 12, 1896.

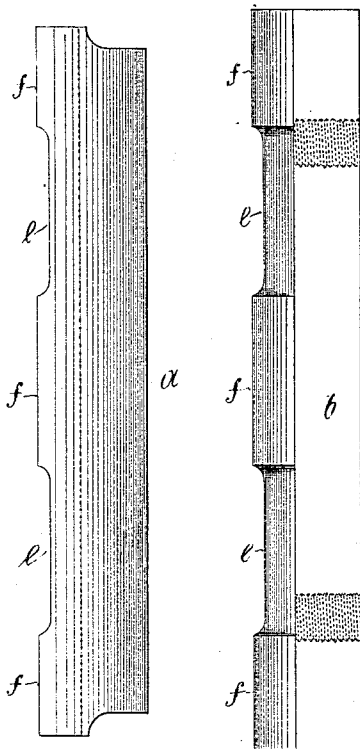


Fig. 1.

Fig. 2.

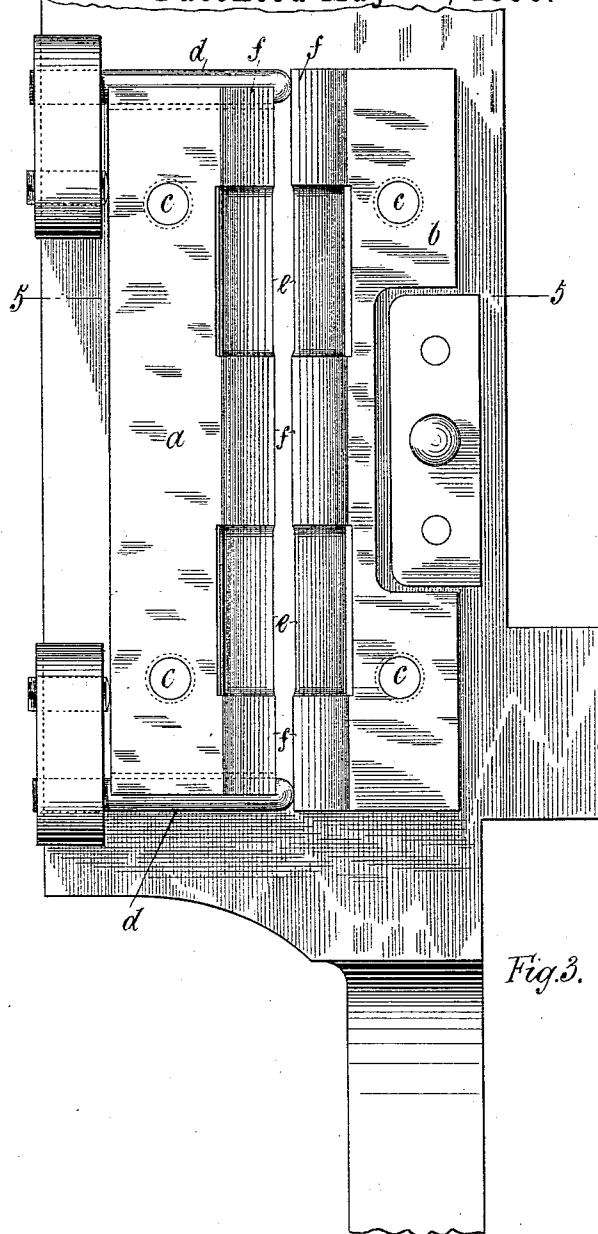


Fig. 3.

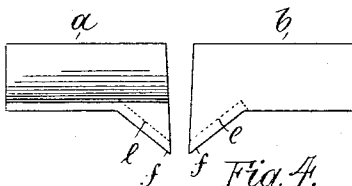


Fig. 4.

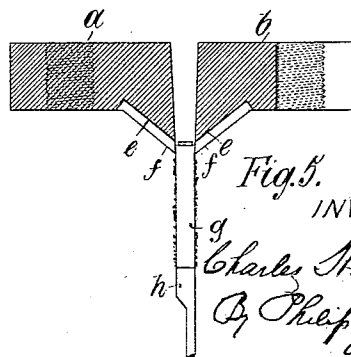


Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES HOLLIWELL, OF MANCHESTER, ENGLAND, ASSIGNOR TO THE
MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

KNIFE FOR TRIMMING TYPE, PRINTING-BARS, &c.

SPECIFICATION forming part of Letters Patent No. 560,000, dated May 12, 1896.

Application filed December 12, 1895. Serial No. 571,897. (No model.) Patented in England November 26, 1894, No. 22,921.

To all whom it may concern:

Be it known that I, CHARLES HOLLIWELL, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at No. 166 Ashton New Road, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Knives for Trimming Type, Printing-Bars, and Linotypes, (for which I have obtained
5 a patent in Great Britain and Ireland, No. 22,921, dated November 26, 1894;) and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being made to the accompanying
10 drawings, which are to be taken as part of this specification and read therewith, and one which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in
20 knives for trimming type, printing-bars, and linotypes; and the object of it is to prevent the piece operated on being delivered cut (*i. e.*, trimmed) on the taper. It is applicable to all machines for casting type, printing-
25 bars, and linotypes; but it has been worked out with more particular reference to the machine known as the "linotype-machine" for the following reasons: (*a*) the product of this machine being a printing-bar as distinguished
30 from a printing-type the risks of strain or stress transverse to the length of the bar are greater than in the case of a printing-type, because of the considerable difference between the lengths of the two, and (*b*) because
35 the linotype-machine is the only machine for making printing-bars which is practically known to the printing trade of this country.

For the purpose of this specification I take the present construction of the linotype-trimming knives as indicative of the state of the
40 art which the present invention is intended to improve. After the linotype is cast it is pushed in a horizontal direction, edge on and end up, up to and between the two parallel
45 vertical knives. When the linotype has been pushed past these knives, it is found to be cut or trimmed on the taper, its back or base being thinner than its front or top. It is not pretended that the amount of taper is linearly
50 considerable in a single linotype; but it is ob-

vious that as all the linotypes trimmed are equally affected the total taper amounts to enough to prevent a column of linotypes presenting that parallelism between their opposite planes which is an assumed condition
55 precedent to the locking up of the form.

The production of the taper above described is due, primarily, to the fact that the two knife-edges in question being rectilinear each
60 knife-edge gets into cut along its entire length at the same moment and simultaneously with its fellow.

According to the present invention some portions of the edge of each knife are set back, so that the entire edge gets into cut gradually.
65 The direct results of this getting into cut gradually are that the linotype is put under stress gradually, that the knives are put under strain gradually, that those portions of the linotype and of the knives which are
70 the first to get under and into cut serve, by their mutual and combined engagement, to prevent other portions springing, and, finally, the linotype is delivered from the knives having its two sides cut parallel with each other.
75

Referring to the accompanying drawings, Figure 1 is a side elevation of the shorter of the two trimming-knives of a linotype-machine, looking at it from the left hand of the machine. Fig. 2 is a side elevation of the
80 longer of the two trimming-knives of a linotype-machine, looking at it from the left hand of the machine. Fig. 3 is a rear elevation of the same two trimming-knives, including the set-screws, looking at them from behind the
85 machine. Fig. 4 is a plan of the same knives, excluding the ends of the set-screws. Fig. 5 is a horizontal section on the line 5 5 of Fig. 3, and includes in plan a linotype undercut and the nose of the ejector-blade, which is
90 pushing it through between the knives.

a is the shorter and *b* the longer of the two knives.

c c are the screw-threaded holes for the set-screws, by which they are held to the machine.
95 The difference in the lengths of them is caused by the presence of the two set-screws *d d*, which are used to set the cutting edge of the knife *b* exactly parallel with that of the shorter one *a*.
100

e e are those portions of the cutting edges of each knife which are set back behind the remaining portions *f f*. When the linotype *g* is pushed up to the knives by the ejector-blade *h*, it is the front portions *f f* that get into cut first, and after they have got fairly in cut then the set-back portions *e e* get into cut, but not before. The amount of set back may be varied, as may be desired, but that illustrated is a satisfactory one under average circumstances. It will be evident from what has been said about the way in which the present invention achieves the prevention of springing that the relative positions of the leading and the set-back portions *f* and *e*, respectively, may, under favorable circumstances, exert a marked influence upon the amount of prevention achieved. As a rule, much depends upon this relative position. I consider that the one illustrated in the figures is the best that can be adopted. The two ends and the middle portions of the cutting edges get into cut first because they are the leading portions. This means that both knives are in cut along their extremities and over their middle portions before the intermediate portions are called upon, but it means something of more importance still—viz., that there are intermediate portions of both cutting edge and linotype which have time to adjust themselves under the general strain before they are under actual and maximum strain. Further, it means that the strains along the two lines where the portions *f f* are in cut are not continuous, but separated by the interposition of the set-back portions *e e*. So, likewise, with the lines where the last-mentioned portions are in cut. It is obvious that it is better that there should be a respectively odd and even number of leading and set-back portions, for then there will be a leading portion at each end. In fact, to have both in even numbers would go far to defeat the object of the invention.

Another relation in respect of dimension is that between the length of a set-back and that of a leading portion. A set-back portion *e* is shown as longer than an end leading portion *f* and of the same length as the central leading portion. The relation in question is of secondary importance only and may be decided according to the circumstances of each particular case. At the same time I have to

point out that the relation illustrated is a very satisfactory one.

The figures show the cutting edge of one knife as the counterpart of that of the other one, (excepting as to the trivial shortening caused by the presence of the set-screws *d d*.) I prefer this correspondence and recommend that it be always provided for.

It is to be understood that my invention is constructed and arranged to produce a flat surface on the linotype. Although the front edge of my knife is broken—that is to say, has certain portions in rear of other portions—the entire cutting portion acts in the same or substantially the same plane, as clearly shown in Fig. 5. In other words, the forward cutting edges are acting to dress to a common plane portions of the surface of the slug or linotype, while the rear cutting edges following after finish the remaining or intervening portions of the surface of the slug flush with the portions finished by the forward edge.

I am aware that ribbed or toothed knives have been constructed in arts entirely foreign to type-casting for the purpose of cutting parallel grooves or channels, and this I do not claim.

What I claim as my invention is—

1. In a linotype-machine, a knife constructed and arranged to dress the surface of a linotype to a common plane, said knife having portions of its cutting edges set in advance of the remaining portions as described and shown.

2. In a linotype-machine, the combination of two opposing trimming-knives between which the slug is delivered, each of said knives having at the front leading cutting portions *f* and following cutting portions *e*, the leading and following portions of each knife arranged to dress the surface to a common plane.

3. In a linotype-machine, a trimming-knife having its cutting edge composed of leading portions and following portions *e* and *f*, both arranged to act in the same plane.

In witness whereof I have hereunto affixed my signature, in presence of two witnesses, this 12th day of November, 1895.

CHARLES HOLLIWELL.

Witnesses:

FRANCIS I. JACKSON,
JOHN ALLAN STREET.