No. 614,590. Patented Nov. 22, 1898.

# F. J. WICH.

## TRIMMING MECHANISM FOR LINOTYPE MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

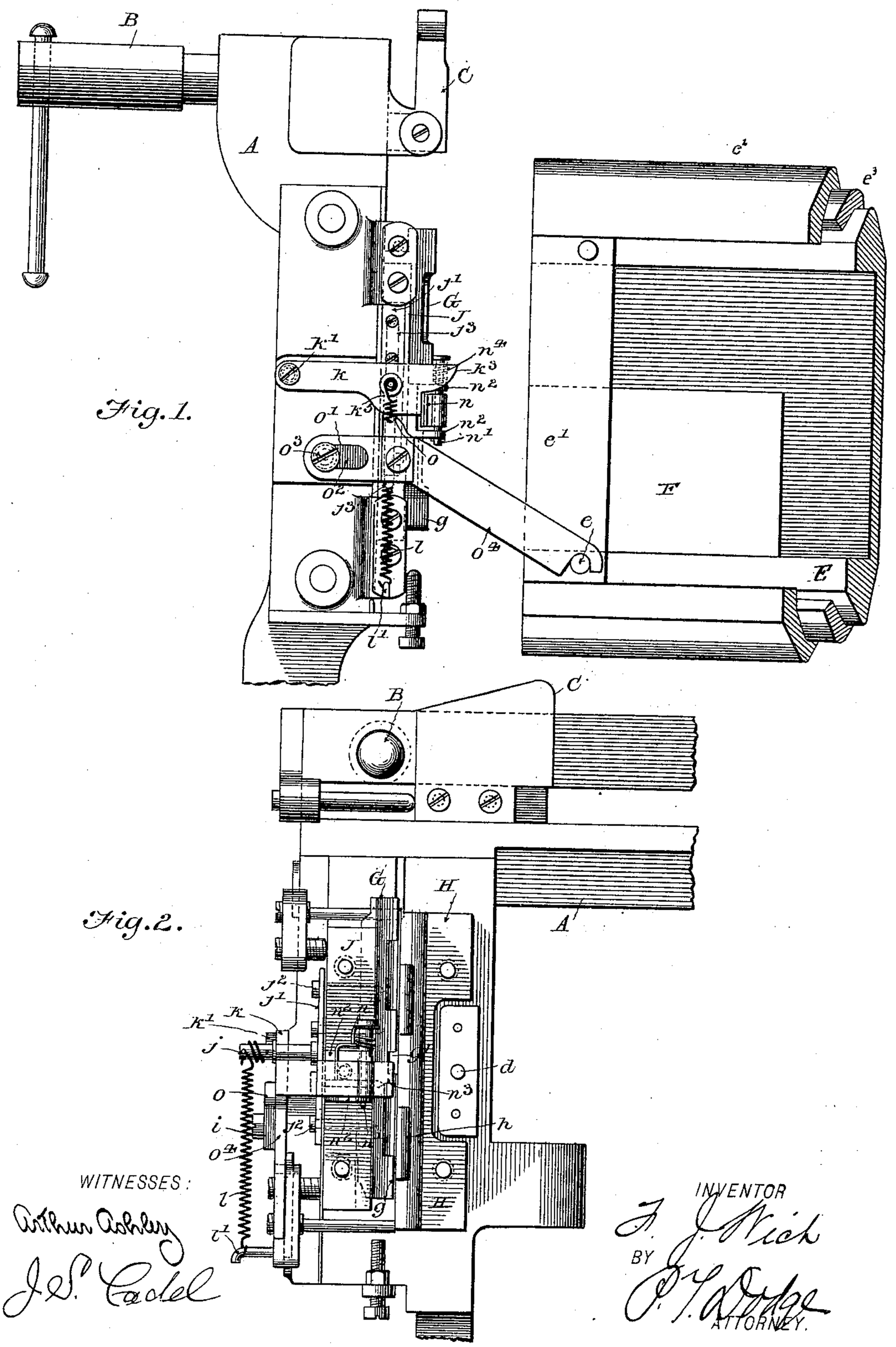


Fig. 2.

WITNESSES:

Arthur Ashley

J. S. Cadel

INVENTOR

F. J. Wich

BY

C. J. Dodge

ATTORNEY.

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# F. J. WICH.

## TRIMMING MECHANISM FOR LINOTYPE MACHINES.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

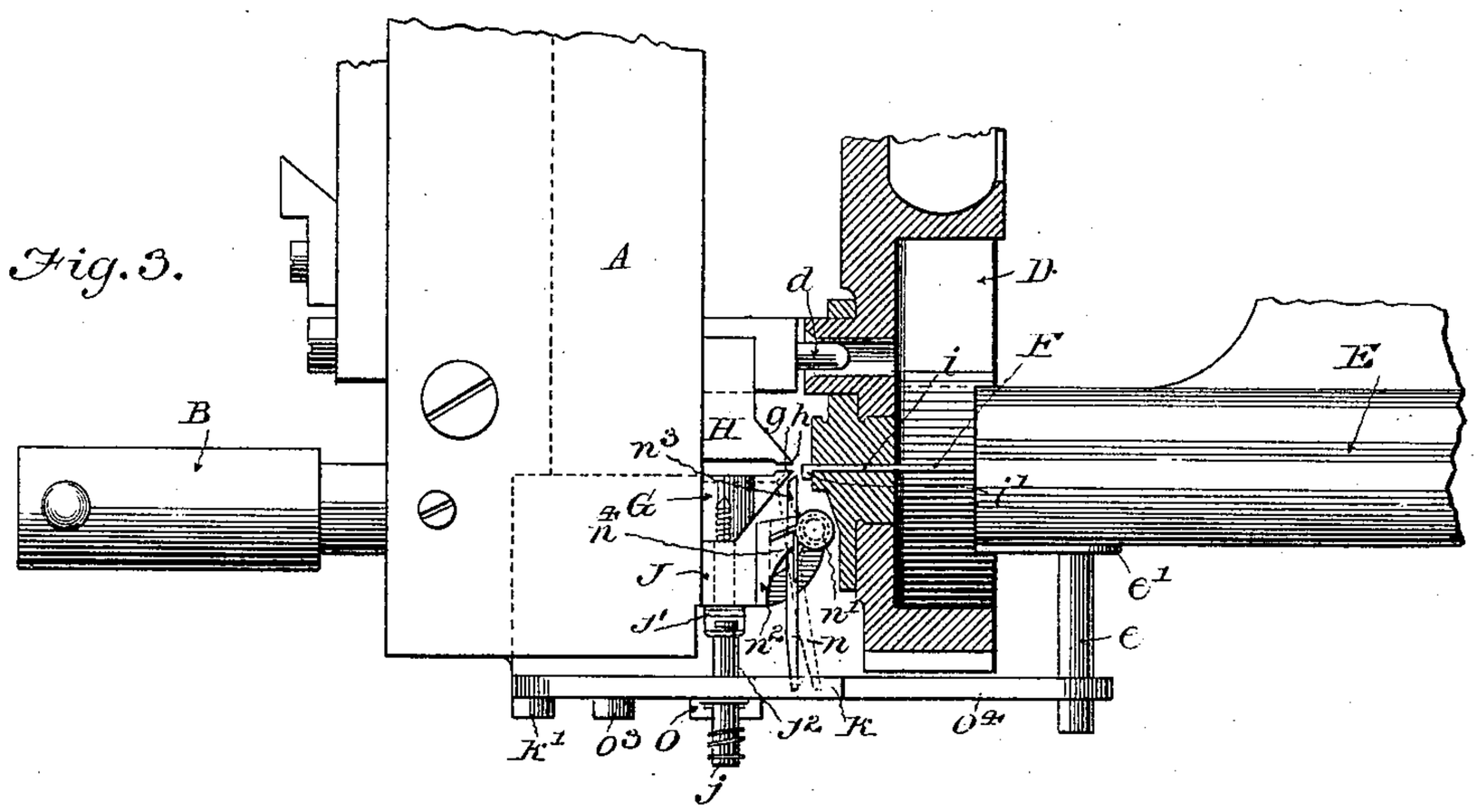



Fig. 4.

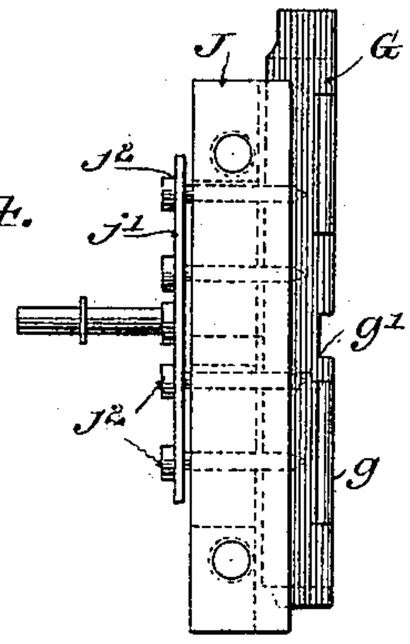



Fig. 5.

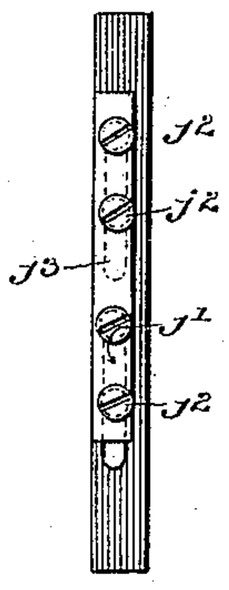



Fig. 6.

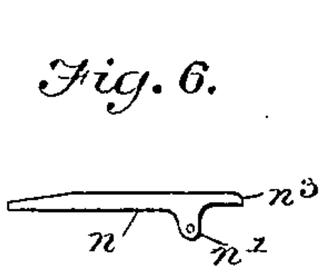



Fig. 7.

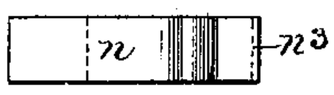
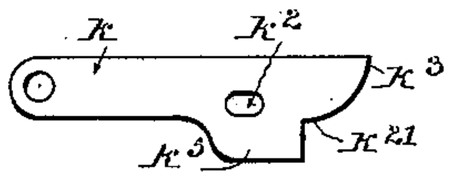



Fig. 8.




WITNESSES:

Arthur Ashley

J. S. Cadell

INVENTOR

F. J. Wich

BY

P. G. Dodge

ATTORNEY.

# UNITED STATES PATENT OFFICE.

FERDINAND J. WICH, OF MANCHESTER, ENGLAND, ASSIGNOR TO THE MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

## TRIMMING MECHANISM FOR LINOTYPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 614,590, dated November 22, 1898.

Application filed December 31, 1897. Serial No. 665,105. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND JOHN WICH, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at Manchester, England, have invented certain new and useful Improvements in the Trimming Mechanism of Linotype-Machines, (for which I have obtained a patent in Great Britain and Ireland, No. 1,389, dated January 21, 1895;) and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being made to the accompanying 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 the trimming mechanism of linotype-machines; and the object of it is to prevent loss and damage and to expedite work when the machine is engaged in producing linotypes some of which begin with two-line capitals.

Those who are familiar with the machine production of linotype or printing bars are aware that there is a certain amount of trimming to be done to both their sides. The two-line capital at the head of a linotype has the lower half of it projecting beyond the adjacent side of the linotype. Such projection or apron therefore renders the trimming of the sides of such linotype by its being passed between a pair of parallel trimming-knives as long as itself impracticable, for the reason that such passage would result in the lower half—the above-mentioned projection or apron—of the capital being shorn off. To prevent such shearing off, it has been proposed to make the respective knife end capable of being moved out of the way before the advance of the two-line-capital linotype toward the trimming mechanism has brought it up to the cutting edges of the latter and of being replaced in its normal position before the advance of the next normal linotype. The provision at present in use for so moving the said knife end out of the way has been essentially of a type for hand manipulation only and for that reason one demanding alert attention on the part of the mind, the eye, and the hand of the operator, or loss of time and material, damage to linotypes, and delayed output are more or less inevitable.

The details of the provision above mentioned will be found in the specification of Letters Patent No. 8,258 of 1894 and are as follows: The respective knife end is in a separate piece from the rest of the knife; but it is pivoted thereto, so as to be capable of being turned by a winch through a quarter of a circle and that in the plane of the whole knife. The pivot is so positioned that the tail of the knife end—*i. e.*, the piece of the latter on the side of the pivot opposite to the trimming edge—stands, after the winch-handle has been turned through the distance stated, at a distance from the rest of the knife greater than the width of the projection or apron of the two-line capital, thereby establishing a clear way for the passage of such projection or apron; but if the operator does not turn the winch-handle at the right moment the two-line-capital linotype will lose the said projection or apron, and if he does not turn the winch-handle back in time the next normal linotype will be imperfectly trimmed.

The present invention consists, broadly, in an automatic provision for moving the knife above described out of the way and for bringing it back again. This provision consists in the combination of a trip-lever adapted to be tripped through a short but certain distance by the naturally small but sufficient rigidity of the projection or apron on the end of the linotype-bar in the sense of being moved out of the path of a stud or block on or connected to the said knife, a device constantly urging the said knife in the direction of its edge out of the way of the advancing projection or apron aforesaid, and mechanism for completing the motion of the knife and also for returning the latter.

Referring to the accompanying drawings, Figure 1 is a side elevation from the right hand of the operator of part of the vise-frame, one of the knives, the mechanism for actuating it, the ejector-blade, and part of the mold-wheel slide. Fig. 2 is a rear elevation corresponding with Fig. 1, but omitting the ejector-blade and the mold-wheel slide. Fig. 3 is a plan of Fig. 1, including the mold-block and part of

the mold-wheel, both in section. Fig. 4 is a rear elevation of the movable knife and knife-guide. Fig. 5 is a side elevation from the right hand of the knife-guide. Fig. 6 is a plan of the trip-lever. Fig. 7 is a rear elevation thereof. Fig. 8 is a side elevation from the right hand of the stop-lever.

A is part of the pivoted vise-frame; B, one of the fastening screws of the top of the latter; C, the stationary jaw of the vise; D, the mold-wheel; E, the mold-wheel slide, and F the ejector-blade. These parts are substantially the same as are described in the specification of Letters Patent No. 436,532 of 1890.

The mechanism for actuating the mold-wheel slide and the ejector-blade are both omitted from the figures for the reason that they, as well as the members they actuate, are outside the present invention.

G H are the two trimming-knives, and *g h* their cutting edges. They are both supported on the rear face of the vise-frame A in a vertical position parallel with each other and at the proper distance apart, as heretofore, for the passage of the linotype *i* and the ejector-blade F; but instead of both being stationary, as heretofore, only one of them, the one on the left hand, (looking at the machine from the front,) is stationary, the other, G, being movable. The reason why it is the right-hand knife that is movable is that the two-line-capital linotype *i* presents itself to the trimming-knives with its projection or apron *i'* projecting to the right hand.

The knife G is movable in the direction of its cutting edge *g* in a guide J. The latter may be of any suitable construction. It is made fast to the same surface of the vise-frame as the knife H. It is obvious that the length of the travel in the guide which the knife G must be capable of may not be less than the width of the apron *i'*, measuring across it in the direction of the length of the linotype. This dimension presents itself in a vertical sense in connection with the accompanying figures. The apron *i'* being at the top of the linotype the travel of the movable knife G to clear the said apron must be downward, and its return travel to its normal position, so as to be ready to trim the respective side of the next linotype, which would be one not having a two-line capital, must be upward.

*j* is a stud projecting laterally from the right-hand side of the movable knife G, to which it must be made fast, so that one cannot move without the other. According to the construction illustrated the stud is fast to a plate *j'*, which is itself made fast to the knife G by a series of holding-screws $j^2$ $j^2$, passed through a vertical slot $j^3$ in the guide J.

*k* is the stop-bar. It is pivoted on a stud *k'*, standing in front of the stud *j*, and points toward the rear of the machine past the side of the knife G, the stud *j* engaging in a slot $k^2$ in the bar *k*. Provided that the bar *k* is held in a horizontal position, it obviously acts as a stop against the downward motion of the knife G.

*l* is a spiral spring in tension between *l'*, its fixed point or that from which it pulls, and the outer end of the stud *j*, to which its opposite end is made fast and on which it pulls constantly. The action of this spring is therefore to constantly urge the knife G in the direction of its cutting edge *g*, out of the way of or to clear the path of the apron *i'*, and the device in question may for the purpose of the present invention be replaced by any other capable of doing the same work.

The device for holding the knife G up in its normal position for trimming the adjacent side of an ordinary linotype consists of a horizontal part $k^{21}$ of the under side of the front end of the stop-bar *k*, which horizontal part merges in a convex contour $k^3$, extending upward to the rear end of the said bar, and a trip-lever *n*, the right-hand end of which stands under the said horizontal part $k^{21}$ of the stop-bar *k*, thereby holding up the knife G so long as the said lever is not tripped. This trip-lever *n* has its fulcrum in a vertical pivot *n'*, supported in horizontal brackets $n^2$ $n^2$, projecting from the rear face of the guide J. The opposite end $n^3$ of the trip-lever *n* stops short of the cutting edge *g*, so as not to stand in the path of the linotype proper, *i*, but it presents its rear face full to the apron *i'*. The position of this rear face is such with reference to the linotype *i* and the knife-edge *g* as will provide for the motions leading up to the downward travel of the knife G being effected before the linotype proper, *i*, reaches the knife-edge *g*.

$n^4$ is a spiral torsion-spring about an upward continuation of the pivot *n'* and adapted by having one edge of it made fast to a fixed point and the opposite end to the lever *n* at a suitable distance from the axis of the latter to return it to its normal position after it has been tripped and as soon as the upward travel of the convex contour $k^3$ has made it possible for its right-hand end to again stand under horizontal part $k^{21}$ of the stop-bar *k*.

The mechanism for returning the knife G to its normal position, or, in other words, for imparting to it its upward travel already explained, consists of a downward extension $k^5$ of the stop-bar *k*, an upward extension *o* of a bar *o'* adapted to stand under the extension $k^5$ and in touch with it so long as the knife G is in its normal position and the molding mechanism in its rearward position, a horizontal slot $o^2$ in the bar *o'*, a fixed stud $o^3$ projecting laterally from the right-hand side of the vise-frame A through the slot $o^2$, thereby serving as a guide for the motion of the bar *o'*, and a link $o^4$ establishing a connection between the bar *o'* and the mold-wheel slide E through a stud *e*. The latter is one of a pair holding the vertical bar *e'* to the said slide. The latter slides to and fro in $e^2$, part of the frame of the machine, $e^3$ being an intermedi-

ate bushing. The link $o^4$ is detachable from the slide E by means of the hasp-like connection between the two. (Indicated in Fig. 1.)

The trip-lever $n$ serves as one detent to hold the mold-knife G up against the pull of the spring $l$ and the upward extension $o$ as a second one. The former is the one relied on for the purposes of the present invention.

The bottom front corner of the extension $k^5$ and the top front corner of the extension $o$ being destined to rub over each other are convex to each other, so as to smooth their mutual contact.

The action of the invention is as follows: The advance to the front of the mold-wheel slide E pushes the detent $o$ to the front away from under the downward extension $k^5$ of the pivoted bar $k$, thereby leaving the movable knife G held up only by the trip-lever $n$ against the pull of the spring $l$. The said advance has also brought the said wheel and a subsequent partial revolution of the mold-wheel D about its own axis into the position illustrated in Fig. 3, in which it is held steady by its engagement with the steadying-pin $d$, the advanced position of the mold-wheel slide E being indicated in dotted lines. The ejector-blade F is next pushed to the front, as indicated in the same figure, by its actuating mechanism and pushes the linotype $i$ forward. The apron $i'$ on the latter engages the end $n^3$ of the trip-lever $n$ and trips the latter, throwing it into the position indicated in dotted lines in the said figure. The knife G is pulled down by the spring $l$ before the apron $i'$ reaches the vertical plane in which stand the cutting edges $g$ and $h$. The completion of the forward motion of the ejector-blade F pushes the linotype $i$ past the edges $g$ and $h$, thereby effecting the trimming of both its sides, while the apron $i'$ passes unharmed either over the top of the knife or through a notch therein. It is explained farther on how the clearway over the top of the knife or that through the notch are the equivalents of each other. The return motion of the mold-wheel slide E makes the upward extension or detent $o$ engage the downward extension $k^5$ on the pivoted bar $k$ and, by raising it, put the knife G through its upward travel. As soon as the said knife has attained its normal position the torsion-spring $n^4$ swings the trip-lever $n$ under the above horizontal part $k^{21}$ of the stop-bar $k$, thereby holding the said knife up in its normal position. It will thus be seen that it is the two-line capital that compels the knife G to modify its position so as to spare the apron $i'$ and some one of the cycle of casting operations that replaces the adjusted knife, so that the machine itself keeps its trimming apparatus always set for normal linotypes and changes it only when the two-line capital has made its presence felt, so demanding no attention whatever from the operator.

From the foregoing it will be gathered that so long as the construction and operation of the machine present the linotype $i$ to the trimming-knives with the projection $i'$ at the top so long must the latter pass over the top of the adjusted knife G, excepting when the knives G and H are much longer than the linotypes of the series of which the two-line-capital linotypes being made in the machine are individual members. In the latter case the formation of a square notch or grating $g'$ in the edge $g$ in the proper position provides for the passing of the projection $i'$, the bottom of the notch being treated by the said projection as if it were the top of the movable knife.

It must be understood that I do not limit myself to the detents or to the mechanism for returning the movable knife to its normal position in the precise forms illustrated and described, as any modification thereof may be used, provided that they are capable of discharging the respective functions specified. Further, it must be borne in mind that the bar $o'$ may be linked to any member of the machine other than the one illustrated and described, provided that it reciprocates regularly with the casting mechanism.

I claim—

1. The combination with the trimming mechanism of a linotype-machine, of automatic mechanism for moving one knife out of the path of the projection or apron on a two-line-capital linotype, said automatic mechanism being adapted to be operated by the advance of such projection or apron, and a mechanism for returning the said knife to its normal position, operated by the linotype-machine itself.

2. The combination with the trimming mechanism of a linotype-machine, of automatic mechanism for moving one knife out of the path of the projection or apron on a two-line-capital linotype, said automatic mechanism being adapted to be operated by the advance of such projection or apron; mechanism for holding the said knife to its normal position, operated by the linotype-machine itself, and an automatic device for holding the knife up in its normal position.

3. The combination of fixed trimming-knife; trimming-knife capable of motion in the direction of its cutting edge; an automatic device for moving it in that direction so as to clear the path of the projection or apron on a two-line-capital linotype; trip-lever adapted to support a stop for the movable knife and to be tripped by the retiring molding mechanism to return the stop; and an automatic device for returning the trip-lever under it.

In witness whereof I have hereunto affixed my signature, in presence of two witnesses, this 11th day of March, 1896.

FERDINAND J. WICH.

Witnesses:
FRANCIS D. JACKSON,
W. H. BURLING.