

No. 614,589.

Patented Nov. 22, 1898.

F. J. WICH & C. L. IRELAND.

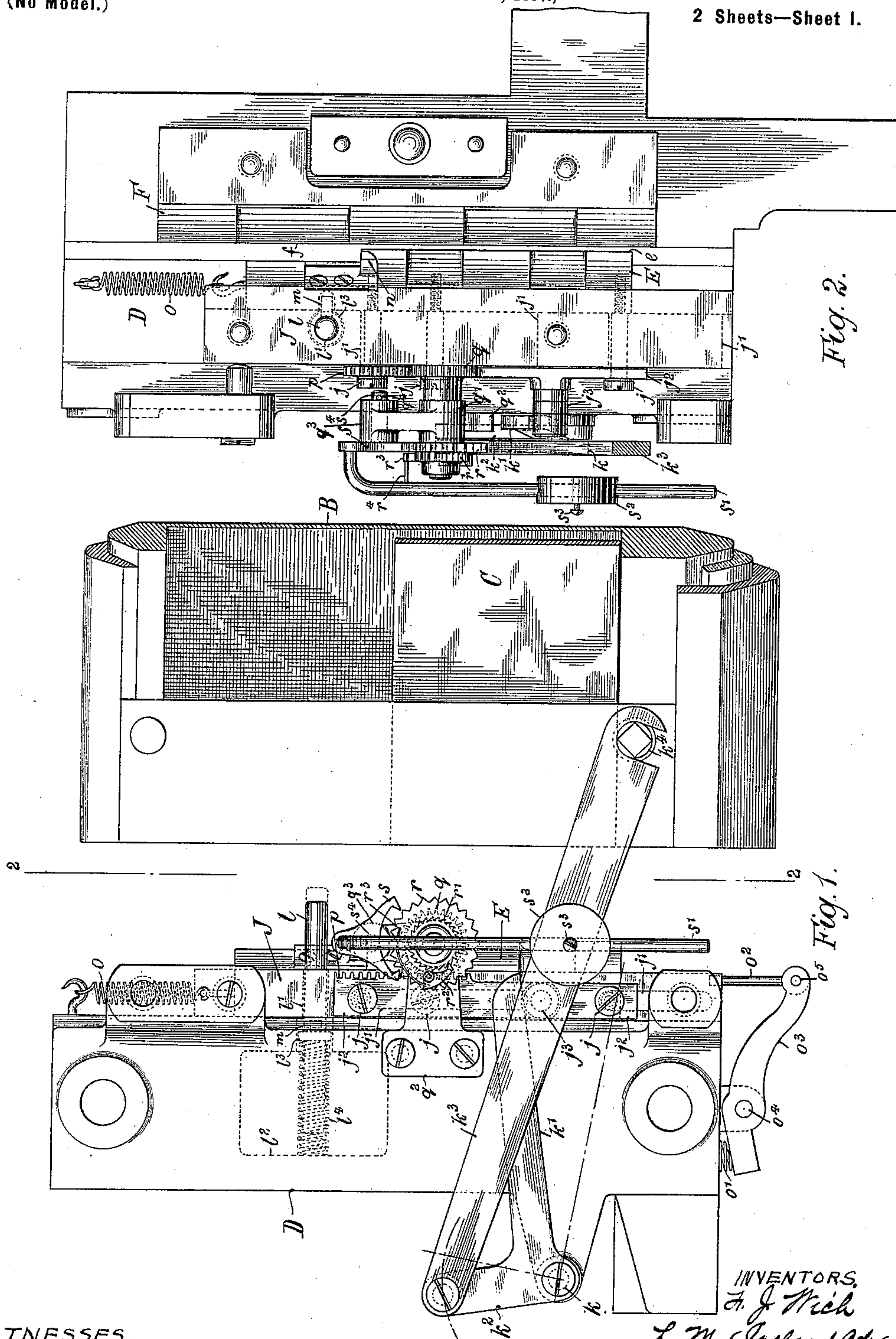
L. M. IRELAND, Administratrix of C. L. IRELAND, Dec'd.

TRIMMING MECHANISM FOR LINOTYPE MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES.
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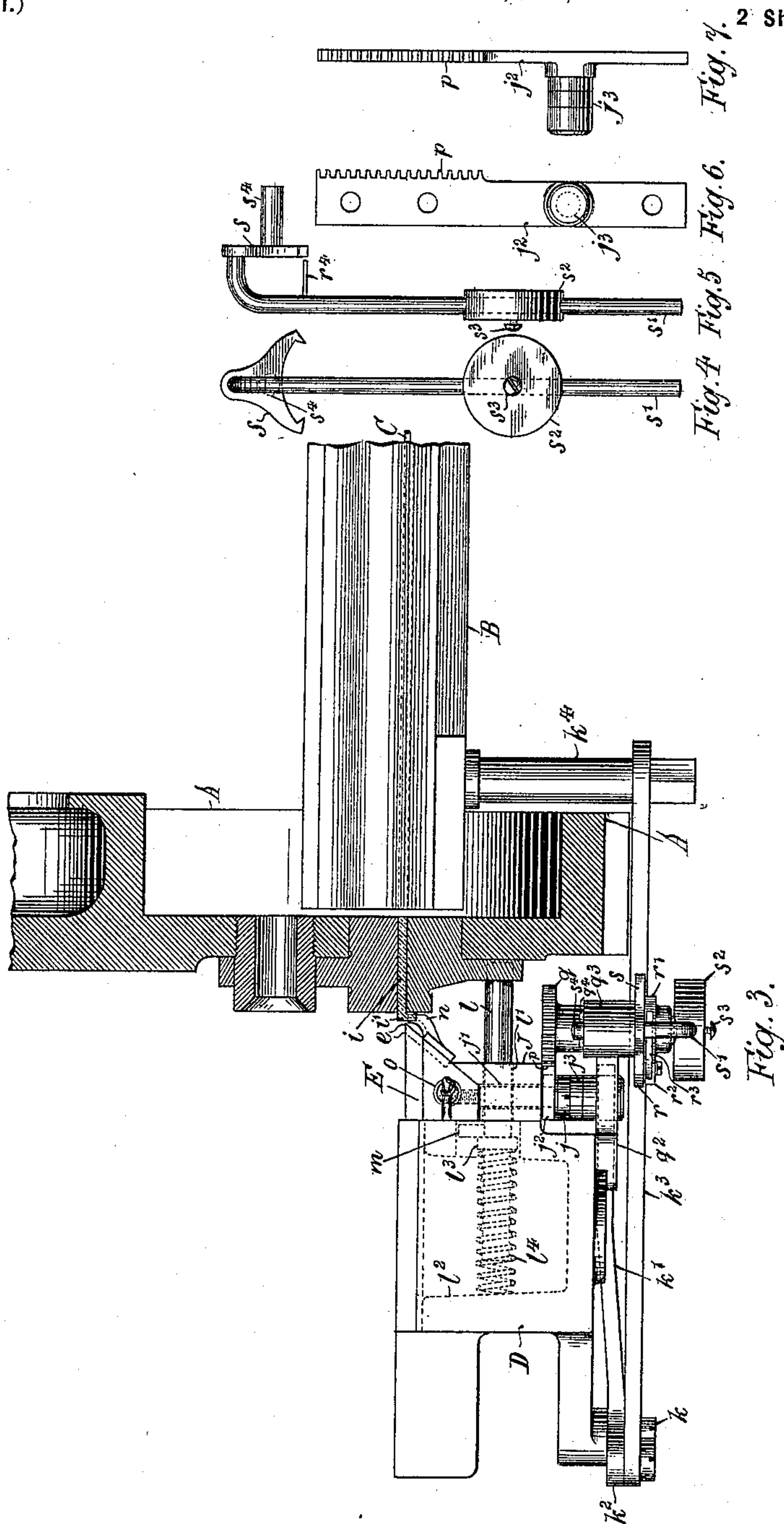
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UNITED STATES PATENT OFFICE.

FERDINAND JOHN WICH, OF MANCHESTER, ENGLAND, AND LOTTIE M. IRELAND, OF NEW YORK, N. Y., ADMINISTRATRIX OF CHARLES L. IRELAND, DECEASED, ASSIGNORS TO THE MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

TRIMMING MECHANISM FOR LINOTYPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 614,589, dated November 22, 1898.

Application filed December 31, 1897. Serial No. 665,102. (No model.)

To all whom it may concern:

Be it known that FERDINAND JOHN WICH, a subject of the Queen of Great Britain and Ireland, residing at Manchester, in the county of Lancaster, England, and CHARLES LEWIS IRELAND, late a subject of the Queen of Great Britain and Ireland, and a resident of Manchester, in the county of Lancaster, England, but now deceased, invented certain new and useful Improvements in the Trimming Mechanism of Linotype-Machines, (for which Letters Patent have been obtained in Great Britain and Ireland, No. 20,318, dated October 28, 1895,) of which invention the following is a full, clear, and exact specification, reference being made to the accompanying drawings, which are to be taken as part thereof and read therewith, and one which will enable others skilled in the art to which it appertains to make and use the same.

The 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 linotypes 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. The expression "two-line-capital linotype" must be understood as including three-line-capital linotype or the like, as it is evident that the particular size of the capital letter does not affect the matter. Such projection 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 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 to the

trimming mechanism 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 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 British Letters Patent No. 8,258, dated April 26, 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-handle 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 of the two-line capital, thereby establishing a clear way for the passage of such projection; but if the operator does not turn the winch-handle at the right moment the two-line-capital linotype will lose the said projection, and if he does not turn the winch-handle back in time the next normal linotype will be imperfectly trimmed.

It has been proposed to perfect the mechanism for trimming a two-line-capital linotype by providing for the automatic withdrawal of the knife in the direction of its edge, for the introduction into the space so vacated of the projection of the two-line capital, for the return of the knife along its line of withdrawal, for the apron acting as a stop to it by standing as an abutment against the end of the knife, for the restoration of the knife to its normal position, and for the disconnection of the withdrawing mechanism when the following linotype is an ordinary one.

It is well known that in the linotype machine the mold for the linotype is a slot in a mold-wheel, that the latter is carried on an axle which is part of the mold-slide, that this slide is capable of a motion up to and away from the casting position, that the mold is advanced to the casting position against the matrices and withdrawn therefrom for a short distance after the casting operation, that the mold-wheel then makes a partial revolution, thereby bringing the mold and linotype in it opposite the ejector-blade, that the latter is moved forward into the mold, ejects the linotype, and is then withdrawn from the mold, and that the mold-wheel then rotates into its normal position. Perfecting mechanisms of the type described will be found fully described in the specifications of British Letters Patent No. 1,389, dated January 21, 1895, and No. 14,047, dated July, 23, 1895; but experience in the working out and practical application of such perfecting mechanisms has demonstrated that the automatic return motion of the knife is apt to be too strong for the projection; that the latter cannot always be relied on to act as a stop, for the top of the knife will shear off the projection of a narrow capital, such as "I," and may sometimes do the same for the lower half of a "W."

The present invention consists, broadly, in providing an additional mechanism adapted to brake or retard the return motion of the knife so far as to bring it within the opposing or stopping power of the projection.

Our invention does not limit us in respect of the particular type of brake or retarding device which we may employ.

We have found that a graduated let-off mechanism, consisting of a modified pendulum escapement, gives a satisfactory result, and for that reason we have selected it for illustration and detailed specification; but it must be understood that the combination of an alternative brake mechanism of either of the four types mentioned above or of any other equivalent type with the movable trimming-knife is within the scope of the present invention.

Referring to the accompanying drawings, Figure 1 is a side elevation from the right hand of the machine of the right-hand knife-block, the mold-wheel slide, and the ejector-blade. Fig. 2 is a rear elevation taken along the line 2 2 of Fig. 1, but omitting the buffer device. Fig. 3 is a plan of Fig. 1, but including part of the mold-wheel with the two-line-capital linotype in it advanced to the trimming mechanism far enough to unlock the movable trimming-knife. Fig. 4 is an elevation from the right hand of the pendulum escapement. Fig. 5 is a rear elevation corresponding therewith. Fig. 6 is an elevation from the right hand of the rack-plate. Fig. 7 is a rear elevation corresponding therewith.

A is the mold-wheel; B, the mold-wheel

slide; C, the ejector-blade, and D the trimming-block, to which the trimming-knives are made fast. These parts are substantially the same as are described in the specification of the United States Patent No. 436,532, dated September 16, 1890. The mechanisms 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 which they actuate, are outside the scope of the present invention.

E F are the two trimming-knives, and *e f* their cutting edges. They are made according to British Letters Patent No. 22,921, dated November 26, 1894—*i. e.*, with portions of the edge in advance of the remainder. Both knives are held to the rear face of the trimming-block parallel with each other and at the proper distance apart, as heretofore, for the passage of the linotype *i* and the ejector-blade C. The right-hand knife E is movable in the direction of its length as and for the reason explained in the specification of the British Letters Patent No. 1,389, aforesaid. This motion is a reciprocating vertical one and takes place in a guide J, which may be of any suitable construction. The one illustrated is a block made fast to the rear face of the trimming-block D.

j j j are headed pins or screws fast to the knife E and projecting horizontally to the right through vertical slots *j' j'* in the guide-block J, the length of the said slots being adjusted to the length of the above-mentioned motion of the knife E. *j*² is a plate adapted to slide smoothly upon the right-hand face of the guide-block. It has all the pins *j* made fast to it, and, further, carries a stud *j*³, which is fast to it, and projects laterally from it to the right hand.

k is a pin screwed into a forward extension of the trimming-block for the purpose of providing the fulcrum of a bell-crank lever. One arm *k'* of the latter extends to the rear and rests upon the stud *j*³. The other and shorter arm *k*² stands up above the arm *k'* and has its outer end connected by a link *k*³ to a stud *k*⁴, projecting from the right side of the ejector-slide.

l is a push-pin adapted to move to and fro in a horizontal bearing *l'* and cavity *l*² in the guide-block J and the trimming-block D, respectively. It has a shoulder *l*³ fast on it and a spiral spring *l*⁴ surrounding its front portion and adapted by bearing against the front of the cavity *l*² to keep the shoulder *l*³ up to the back of the block J and the nose of the pin *l* protruded as far to the rear as the length of the pin to the rear of the said shoulder permits of.

m is a block fast upon the pin *l* in a certain position thereon—to wit, the one which will permit it to stand over the front right-hand corner of the knife E (supposing that were its lower position) when the shoulder *l*³ is up

to the block J. This block is in fact a spring-actuated stop adapted to lock the knife E down in the said lower position.

n is a rearward projection from the knife E, so positioned and dimensioned as to stand under the projection i' of the two-line capital at the head of the linotype i at or during the first portion of the travel of the mold-wheel A to the front, as well as a little to the rear of and also a little to the right of the cutting edge e of the knife E, as illustrated in Fig. 3.

o is a returning-spring adapted to pull the knife E up again after its depression by the bell-crank lever above mentioned, and o' a buffer-spring against the downward motion of the same knife, which motion reaches it through an upstanding thrust-pin o^2 and a lever o^3 , the latter having its fulcrum at o^4 intermediate of the pivoted connection o^5 between it and the pin o^2 on the one hand and the buffer-spring o' on the other.

All the mechanism described above is the same as in the before-mentioned Patent No. 14,047 of 1895.

p is a vertical rack fast to the knife E by being in the rear edge of the plate j^2 , above mentioned.

q is a spur-pinion gearing with the rack p . It is fast on an axle which has its bearing in a boss q' , carried by an arm q^2 , fast to and projecting to the rear from the trimming-block D.

r is an escapement-wheel having angular teeth of the contour shown. It is loose on the axle of the pinion q .

r' is a ratchet-wheel fast on the same axle and adapted to prevent the rotation of the escapement-wheel r in one direction by means of a pawl r^2 , pivoted on the said wheel and held in engagement with the ratchet-wheel r' by a spring r^3 . The latter may be kept in action by an arm r^4 , fast to the pendulum-rod mentioned farther on, or in any other convenient way.

s is an anchor-escapement, s' a pendulum-rod fast to it, and s^2 a pendulum-bob adjustable on the said rod by means of a set-screw s^3 . The escapement-pivot s^4 has its bearing in a second boss q^3 , carried by the arm q^2 , above mentioned.

q^4 is a stop-pin adapted to keep the anchor-escapement s in engagement with the escapement-wheel r .

The present invention acts in conjunction with the mechanism described above, as reproduced from Patent No. 14,047 of 1895, as follows: The link k^3 having been connected to the stud k^4 immediately before the rearward motion of the mold-wheel slide, the said motion will have the effect of pulling the knife E down into its lowest position, whereupon the locking-block m is made to stand immediately over its front right-hand corner, thereby locking it down. Neither the gearing of the spur-pinion q with the rack p nor

the engagement of the pawl r^2 with the ratchet-wheel r' have any tendency to stop the said motion of the knife E, because of the pinion q being loose on its axle and because of the set of the pawl r^2 and teeth of the ratchet-wheel r' . The rearward motion of the push-pin l projects its nose as far to the rear as is necessary for it to be engaged by the mold-wheel A at the proper moment for unlocking the block m from the knife E. After the cast the mold-wheel A moves to the front and, engaging the nose of the push-pin l , pushes it into its socket for a short distance, as indicated by the dotted lines in Figs. 1 and 3, and at the same time places the projection i' vertically over the projection n . It has been already explained that the downward motion of the knife e takes it down into its lowest position. This lowest position holds the projection n some distance beneath the path of the linotype projection i' . The continued motion of the mold-wheel A pushes the block m off the knife E, which is then free to be raised by the spring o . It is at this point that the present invention comes into operation by imposing a brake on the first portion of the upward motion of the knife E. The pull of the spring o and the contour of the teeth of the escapement-wheel r set the pendulum-bob s^2 swinging, because the pawl r^2 locks the escapement-wheel r to the pinion q , with the result that the said portion of the knife's motion is a step-by-step one with a pause between each, each step being no more than the distance of only one tooth of the rack p for each oscillation of the pendulum. The projection n therefore comes up against the linotype projection i' gently enough to obviate the risk of the latter being shorn off. The last-mentioned projection i' is next pushed to the front, along the top of the knife E, by the ejecting motion of the ejector-blade C, whereupon the second or completing portion of the upward motion of the said knife is completed by the pull of the spring o , opposed, it is true, by the pendulum-brake; but the action of the brake during this completing portion of the upward motion is not essential to the invention and occurs only because it is considered unnecessary to provide for the disconnection of the pawl r^2 and ratchet-wheel r' .

What is claimed is—

1. The combination with the movable trimming-knife of a linotype-machine and mechanism for moving it out of the way before the advance of a two-line-capital linotype or the like and for replacing it in its normal position, of a mechanism adapted to brake or retard the return motion of the said knife, as set forth.

2. The combination with the movable trimming-knife of a linotype-machine and mechanism for moving it out of the way before the advance of a two-line-capital linotype or the like and for replacing it in its normal position, of a pendulum escapement adapted to

brake or retard the return motion of the said knife, as set forth and illustrated in the accompanying drawings.

In witness whereof I, the said FERDINAND JOHN WICH, have hereunto affixed my signature, in presence of two witnesses, this 3d day of February, 1897.

FERDINAND JOHN WICH.

Witnesses:

CHAS. S. WOODROFFE,
ROBT. A. BLAKE.

In witness whereof I, the said LOTTIE MARY IRELAND, have hereunto affixed my signature, in presence of two witnesses, this 23d day of December, 1897.

LOTTIE M. IRELAND,
Administratrix of the estate of Charles Lewis Ireland, deceased.

Witnesses:

PHILIP T. DODGE,
J. F. GEORGE.