

No. 636,001.

Patented Oct. 31, 1899.

C. L. IRELAND, Dec'd.

L. M. IRELAND, Administratrix.

TRIMMING MECHANISM FOR LINOTYPING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

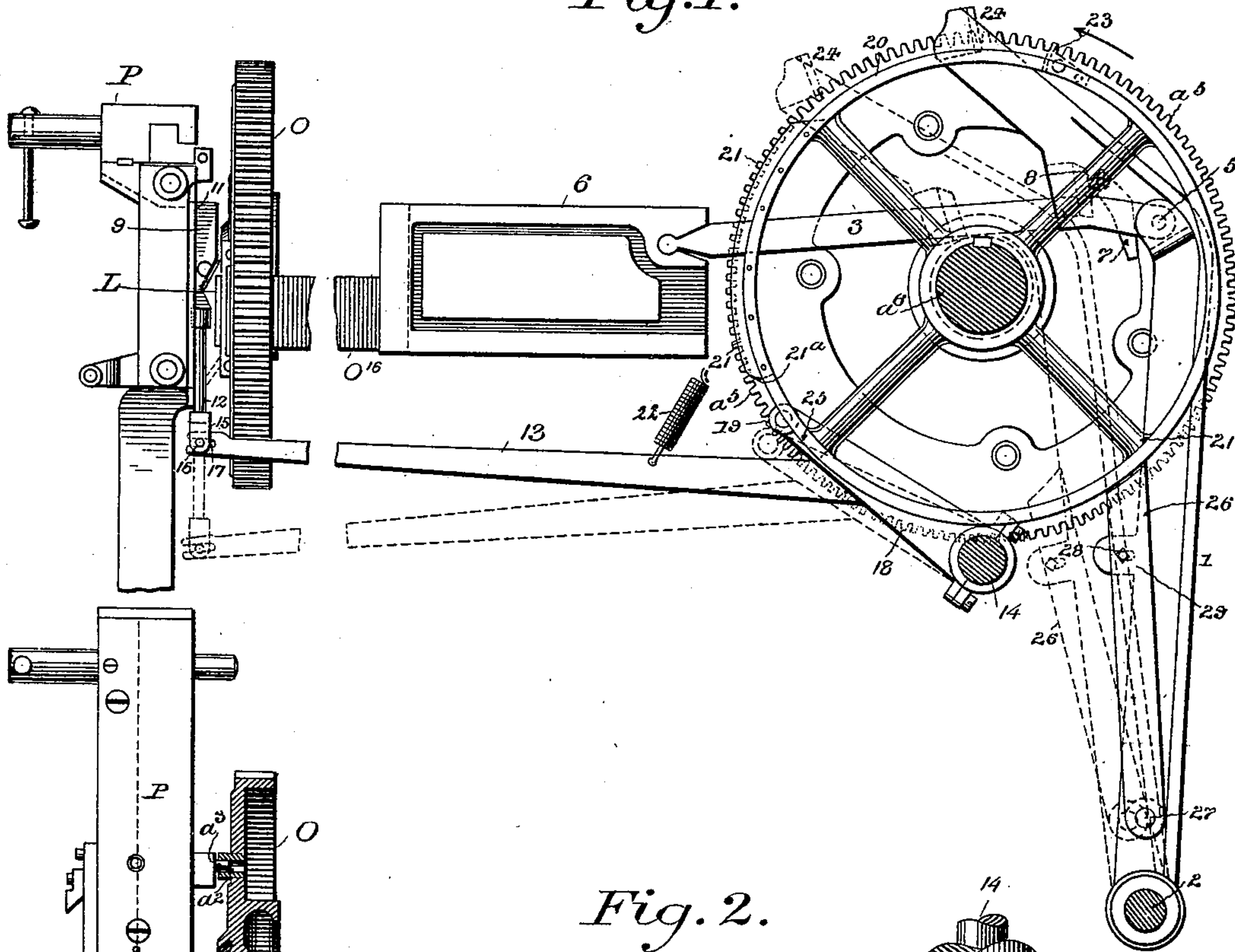
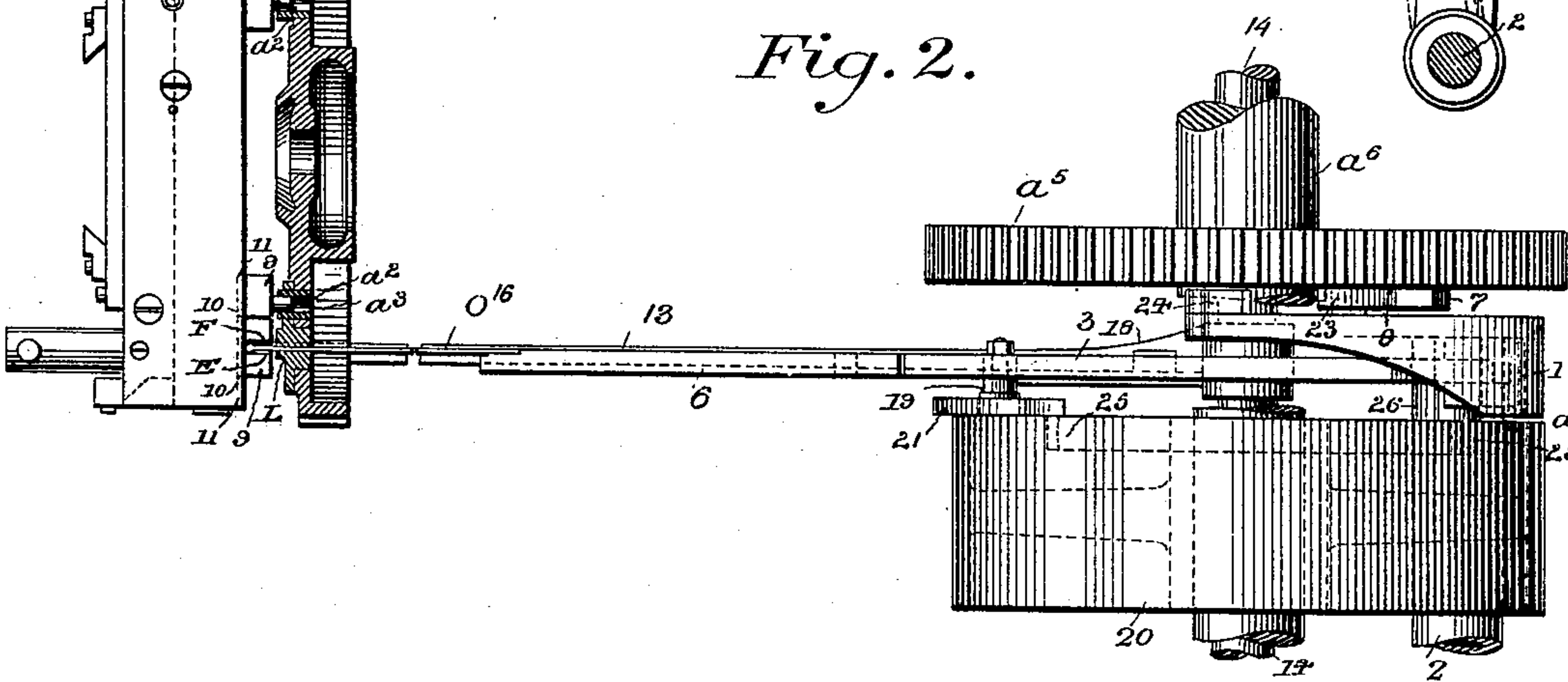


Fig. 2.



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Fig. 3.

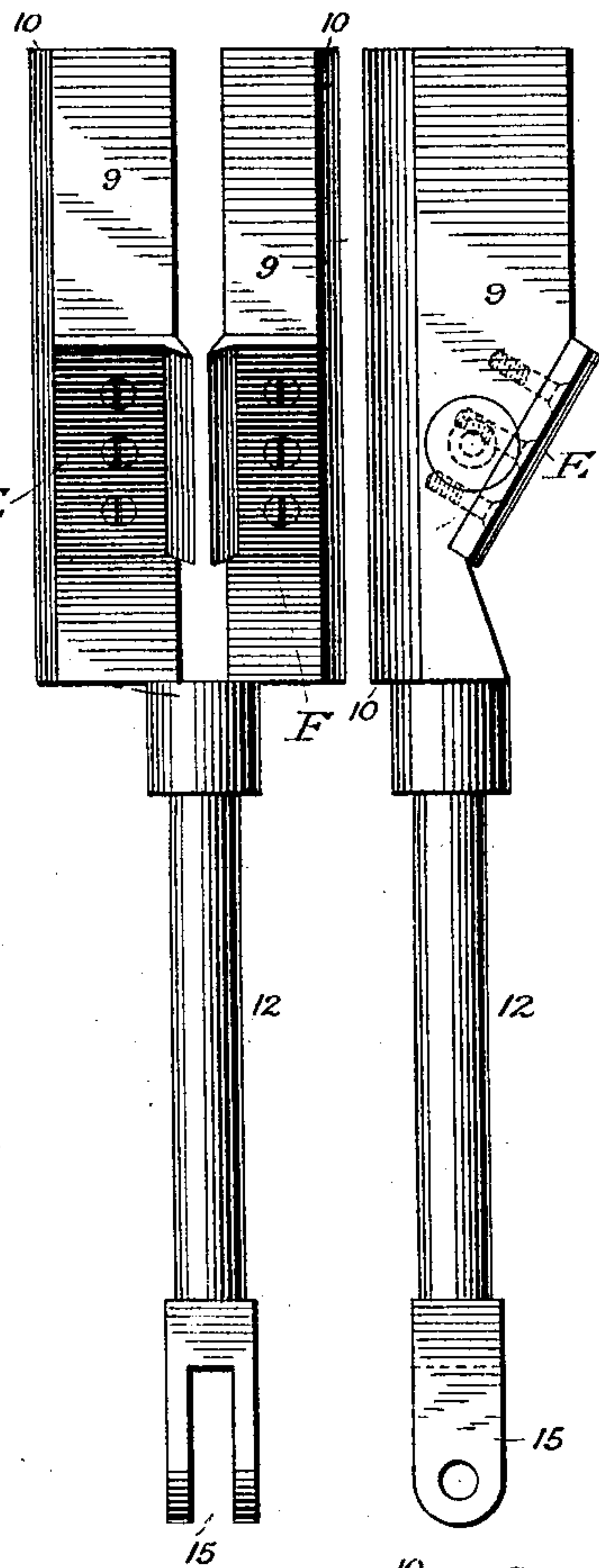


Fig. 4.

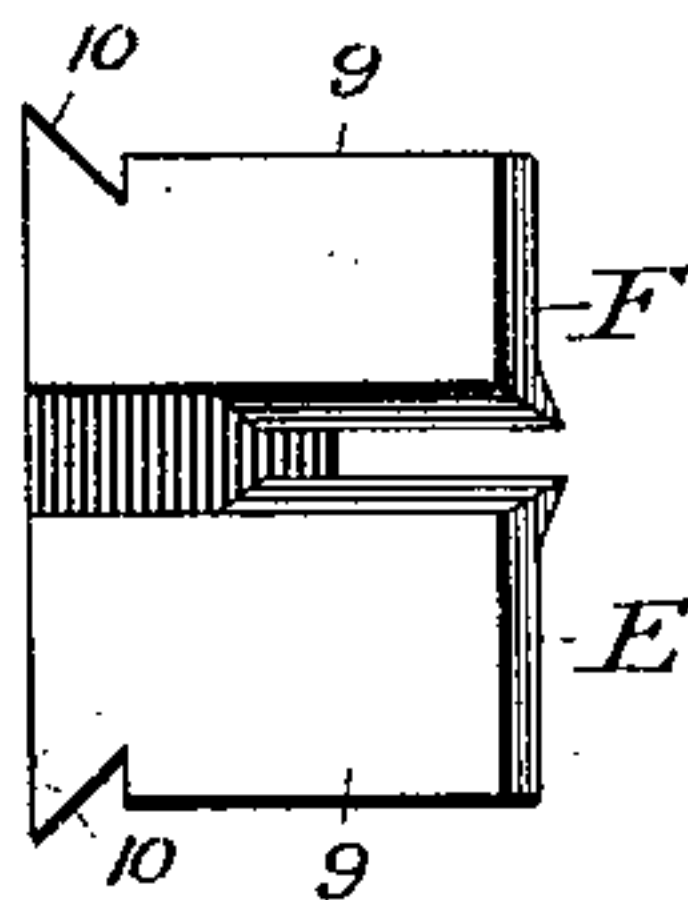


Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## TRIMMING MECHANISM FOR LINOTYPING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 636,001, dated October 31, 1899.

Application filed December 31, 1897. Serial No. 665,188. (No model.)

*To all whom it may concern:*

Be it known that CHARLES LEWIS IRELAND, late a subject of the Queen of the United Kingdom of Great Britain and Ireland, and a resident of Manchester, England, but now deceased, invented a certain new and useful Improvement in the Trimming Mechanism of Linotype-Machines, (for which Letters Patent of the United Kingdom of Great Britain and Ireland, No. 9,438, dated May 4, 1896, have been granted,) and that the following is a full, clear, and exact specification of the said invention and one that will enable any person skilled in the respective art to make and use the same.

The present invention relates to improvements in the trimming mechanism of linotype-machines.

The accompanying figures illustrate the application of the invention to the Mergenthaler linotype-machine described in the specification of Letters Patent of 1890. It must, however, be borne in mind that the said invention is applicable to the trimming mechanism of any linotype-machine. It is only because it has been conceived and developed with special reference to the Mergenthaler linotype-machine and because that machine is the only linotype-machine in practical use in this country that the application of it thereto has been selected for illustration and detailed description. In that machine the linotype is cast in a mold situated in a vertical wheel. The mold is a slot parallel with a diameter of the wheel and nearer to the periphery of it than to the edge. The cast takes place at a time when the mold-wheel is standing with the mold in a horizontal position. It is then turned until the mold is in a vertical position. The two trimming-knives are stationary and their edges are straight, vertical, and parallel. The distance separating them is rather less than the thickness of the linotype. When the mold is in the vertical position just mentioned, the linotype is opposite the edges of the trimming-knives and the space between them. The trimming consists in shaving the two sides of the linotype as much as may be required. It is effected by the forward motion of a so-called "ejector"

pushing the linotype before it out of the mold, between the knives, and through the space between them into a galley in the front of the machine.

There are many objections to the method of trimming described above. One of these objections, and perhaps the principal one, is that during the travel of the linotype between the knives the cutting edges of the latter tend after the manner of cutting edges in general to "follow their own lead," so to speak, and to cut so deeply into the respective sides of the linotype that the latter emerges from the act of being trimmed tapered from top to bottom—that is, narrower across its foot than across the top of its body.

The object of this present invention is to obviate all the objections above referred to; and it consists in the trimming-knives being capable of a motion at right angles with that of the ejector and of the motions of the two—ejector and knives—alternating each other. It includes any suitable automatic mechanism by means of which the ejector on the one hand or the trimming-knives on the other is actuated only during the time that the other is stationary.

Heretofore the motion of the ejector of the Mergenthaler linotype-machine has been regular and the trimming-knives have been stationary. According to the present invention the ejector comes to a rest as soon as it has projected about a third or less of the linotype beyond the mold above mentioned. As to the knives, they stand normally above the linotype instead of in front of it and in opposition to each other in order that they may act on opposite sides of the linotype. Further, instead of being vertical they are inclined so that their edges overhang the protruded portion of the linotype, and instead of being stationary they are capable of a reciprocating vertical motion not less than the length of a linotype, so that one downward motion suffices to trim the said protruded portion on both sides. The return motion of the knives does not commence until after the ejector has been retracted. The ejector is driven by constantly-revolving cam devices, as heretofore; but they are modified so as to impart the in-



termittence required by the present invention. The knife-block—that is, the block to which the two trimming-knives are made fast, as heretofore—has a slide incorporated with it.

5 This slide is connected by a rod to the front end of a horizontal lever, which is depressed at the proper moment by a projection on the cam before mentioned, kept in that position by an arcual continuation of the projection, and returned to its normal position by a spring after the said continuation has passed the lever.

The present invention includes the variation to any extent of the details of the cam and lever mechanisms by which both the ejector and the knife-block are respectively worked. They may be varied to any extent, provided their respective capacities for imparting the several motions described are retained.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a side elevation illustrating the invention in its entirety. Fig. 2 is a plan corresponding therewith, but showing the mold-wheel in section. Fig. 3 is a rear elevation of the knife-block, the two trimming-knives, and the connecting-rod. Fig. 4 is a side elevation corresponding with Fig. 3. Fig. 5 is a plan of the knife-block and the two knives.

$a^5$  is a spur-wheel fast on the shaft  $a^6$ , one of the shafts of the driving mechanism of the machine. It receives a regular motion in the direction indicated by the arrows in Figs. 1 and 2 from a gear-wheel underneath it. This gear-wheel is omitted from the figures.

1 is a vertical lever having its fulcrum upon a fixed shaft 2.

3 is a connecting-rod having its rear end pivotally connected to the lever 1 on a stud 5, fast to and projecting laterally from the lever 1. Its front end is pivotally connected to the rear end of the ejector-slide 6.

45  $o^{16}$  is the ejector-blade, held fast and projecting to the front of the machine from the front end of the ejector-slide 6. This latter organ is so called because it slides to and fro in suitable guides in the machine-frame.

50 7 is a lateral projection fast on the side of the wheel  $a^5$  about midway of the axis and the periphery of the latter. 8 is a lateral projection fast on the side of the lever 1 and standing in the path of the projection 7. The relative positions of the arcs of these two projections 7 and 8, as well as their respective contours, are such that the projection 7—the one on the wheel—will soon after the commencement of their engagement pass the projection 8 and leave the lever 1 standing still. The engagement of the two makes the ejector-blade  $o^{16}$  go through the first part of its motion of ejection. The slide  $o^{16}$ , slide 6, and rod 3 together constitute the ejector. At the moment when the lever 1 is left standing the ejector-blade rests, leaving as much of the

linotype L as is to be trimmed protruding beyond the front of the mold and standing still.

P is a so-called “vise-head.” It is really an abutment, and in it stand the guides 11 11 for the knife-block to slide in.

9 9 are the two portions of the knife-block, and E F the two trimming-knives held by screws to the rear faces thereof, respectively, as heretofore.

The V-shaped extensions 10 10 of the front face of the knife-block constitute the slide above mentioned as being incorporated with it. The slide works between the guides 11 11. The upper portions of the rear faces of the two portions 9 9 stand just clear of the front face of the mold, as shown in Fig. 1. The lower portions of the said rear faces are equally inclined to the front from the plane in which stand the upper portions, and it is to these inclined portions that the knives E F are respectively fastened. This fastening is effected by screws in the same manner as heretofore. Their cutting edges overhang. The degree of inclination is regulated according to the width of the protruded portion of the linotype.

O is the vertical wheel, shown as standing with the mold in the vertical position.

L is the linotype, shown as occupying and partially protruded from the mold.

$a^3 a^3$  are studs projecting to the rear from the vise-frame and engaging in sockets  $a^2 a^2$  on the mold-wheel O to hold the latter steady.

12 is a tail-rod fast to the two portions 9 9 or knife-block and hanging vertically therefrom.

13 is the longer arm of a bell-crank lever extending from the bottom end of the tail-rod 12 toward the rear of the machine and having its fulcrum in a horizontal rod or shaft 14. The front end of the arm 13 and the bottom end of the rod are connected by any device capable of transforming the arcual motion of the said front end into a vertical one in the knife-block 9 9. The one illustrated consists of a fork 15—the bottom end of the tail-rod 12—carrying a transverse pin 16 and a second fork 17, being the front end of the arm 13, embracing the said pin.

18 is the shorter arm of the bell-crank lever above mentioned. It is bent toward the front of the machine and terminates in an antifriction-roller 19.

20 is a drum fast on the shaft  $a^6$ , and 21 is an arc fast on the side of it. The roller 19 stands in the path of the arc 21. The latter is really a cam. Its nose 21<sup>a</sup> is radial to make the action of the cam sudden and is slightly rounded off toward the outer edge or periphery of the cam to make its engagement with the roller 19 easy. The cam 21 occupies such a position on the drum 20 that the nose of it comes into contact with the roller 19 as soon as the above-described partial protrusion of the linotype L has been effected. The projection of the cam—i. e., the distance of its



periphery from the axis of the drum 20—is adapted to put the knives E F through the trimming stroke and the length of it to keep them down at the lowest point of such stroke until the ejection has been completed and that of retraction of the ejector-blade  $o^{16}$  effected. The position in which the lever 13 18, tail-rod 12, and knives E F are held by the said length of the cam 21 is indicated by dotted lines in Fig. 1. As soon as the said cam has cleared the lever 13 18 the knives E F are returned to their original position—the one illustrated in Fig. 1—by a returning-spring 22 pulling from some fixed point upon the lever-arm 13.

The completion of the ejection of the linotype is completed and the retraction of the ejector-blade  $o^{16}$  effected as heretofore.

23 is a lateral projection fast on the side of the gear-wheel  $a^5$ .

24 is a lateral projection from the top of the lever 1. It stands in the path of the projection 23. The top of the said lever is bent and continued to the front and has the projection 24 fast to the front end of it in order that the engagement between the two projections may begin and end at the proper moments, respectively. The end of such engagement coincides with the divergence of the respective paths of the two projections, such divergence being due to the marked non-coincidence of the axis of the shafts  $a^6$  and 2 and takes place when the lever 1 is in the position illustrated by dotted lines in Fig. 1. The retraction of the ejector-blade  $o^{16}$  is effected, as heretofore, by the engagement of an abutment 25, being one end of a recess in the edge of the drum 20, with the nose of a lever 26, pivoted on a stud 27, which is fast on the side of the lever 1 and duly presented in the path of the said abutments for that purpose. The amount of arcual motion on the stud 27 of which the lever 26 is capable is small, being limited by the engagement of a stop-pin 28, fast to the lever 26, in a short slot 29 in the lever 1. The only object of the recess is to provide the abutment 25 and room for the nose of the lever 26 to be swung into its path. To meet the latter necessity, the leading end  $25^a$  of the recess is far enough in advance to be out of the way of the said nose at the moment that the lever 1 is started through the first arc of the motion of ejection. The abutment 25 is so placed as to come up to and engage the said nose just before the retraction of the blade  $o^{16}$  must begin and to clear it at the moment that the retraction of the ejector-blade  $o^{16}$  is completed.

What is claimed is—

1. The combination in a linotype-machine, of an ejector; a lever having the said ejector pivotally connected thereto; a wheel having a lateral projection on its side; a lateral projection on the said lever adapted to be overtaken, pushed through a certain arc and then passed by it; a second lateral projection on the said wheel having a longer radius than

that of the one first mentioned; and a second lateral projection on the said lever likewise adapted to be overtaken, pushed through a certain arc and then passed by it.

2. The combination in a linotype-machine, of an ejector; a lever having the said ejector pivotally connected thereto; a wheel having a lateral projection on its side; a lateral projection on the said lever adapted to be overtaken, pushed through a certain arc and then passed by it; a second lateral projection on the said wheel having a longer radius than that of the one first mentioned; a second lateral projection on the said lever likewise adapted to be overtaken, pushed through a certain arc and then passed by it, and a cam and lever coöperating therewith adapted to actuate the trimming-knives between the two actuations of the said lever.

3. The combination in a linotype-machine, of an ejector; a lever having the said ejector pivotally connected thereto; a wheel having a lateral projection on its side; a lateral projection of the said lever adapted to be overtaken, pushed through a certain arc and then passed by it; a second lateral projection on the said wheel having a longer radius than that of the one first mentioned; a second lateral projection on the said lever likewise adapted to be overtaken, pushed through a certain arc and then passed by it, a cam and lever coöperating therewith adapted to actuate the trimming-knives between the two actuations of the said lever and a cam mechanism for retracting the ejector.

4. In a linotype-machine, the combination of a mold wherein the linotype is formed, means for partly ejecting the linotype from the mold, and two opposing trimming-knives, arranged to move lengthwise of the mold and act on the two opposite sides of the linotype while the latter is held by the mold.

5. In a linotype-machine, the combination of a mold wherein the linotype is formed, means for partly ejecting the slug therefrom, a reciprocating carrier provided with two knives to act on opposite sides of the protruding slug, and means, substantially as shown, for adjusting one of said knives to and from its companion, whereby the knives may be caused to trim the slug to one thickness or another as required.

6. In a linotype-machine a combination of means for holding the linotype.-knives arranged to act on opposite faces of the linotype and mechanism for moving said knives lengthwise of the linotype substantially as described.

Signed at New York city, State of New York, this 23d day of December, 1897.

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*Administratrix of the estate of Charles Lewis Ireland, deceased.*

Witnesses:

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