(No Model.) 3 Sheets—Sheet 1.

F. RUSSELL.

TYPE SMOOTHING MACHINE.

No. 342,386. Patented May 25, 1886.

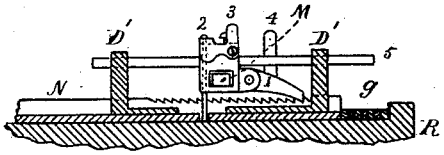

Fig. 10.

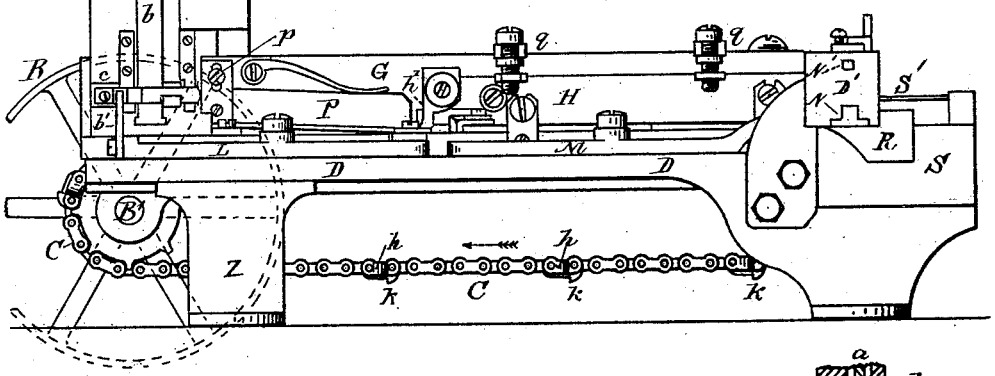

Fig. 1.

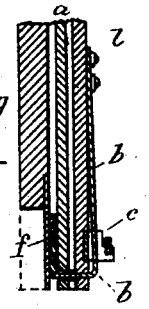

Fig. 3.

Fig. 9.

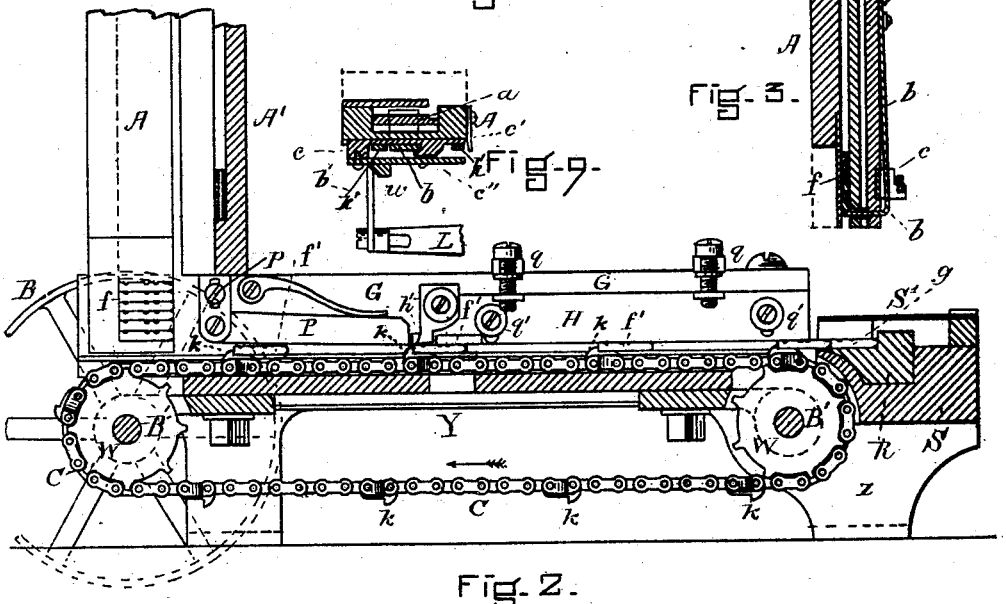

Fig. 2.

WITNESSES

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INVENTOR

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(No Model.) 3 Sheets—Sheet 2.

F. RUSSELL.

TYPE SMOOTHING MACHINE.

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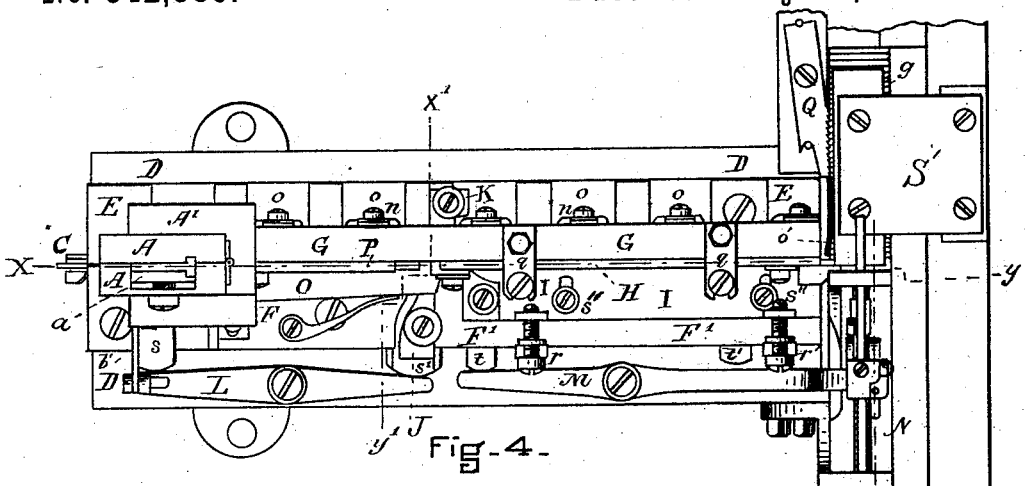

Fig. 4.

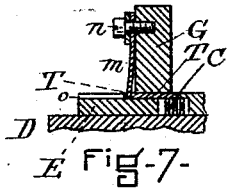

Fig. 7.

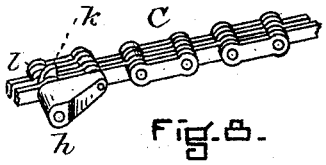

Fig. 8.

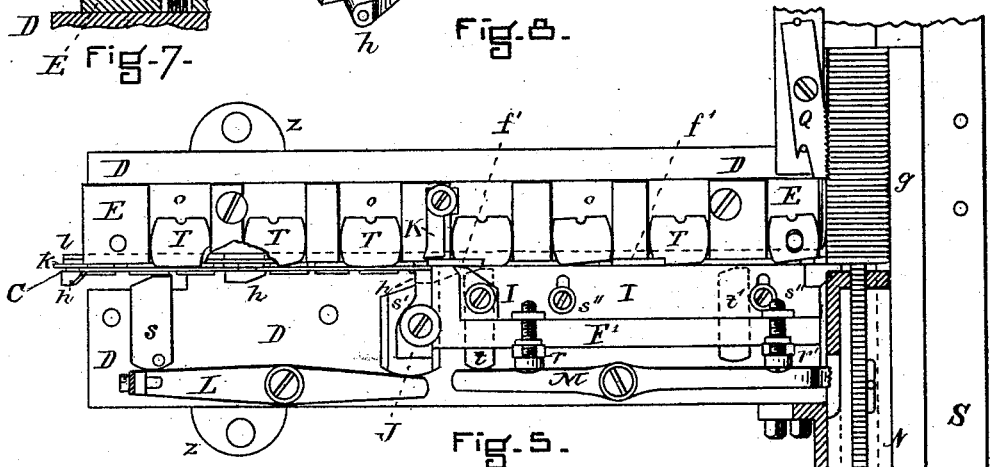

Fig. 5.

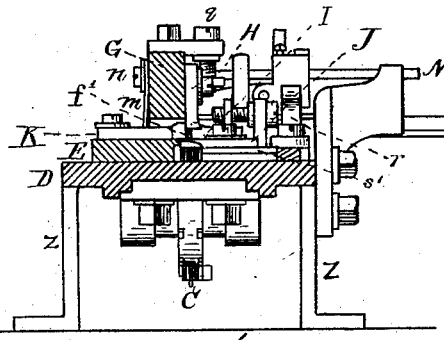

Fig. 6.

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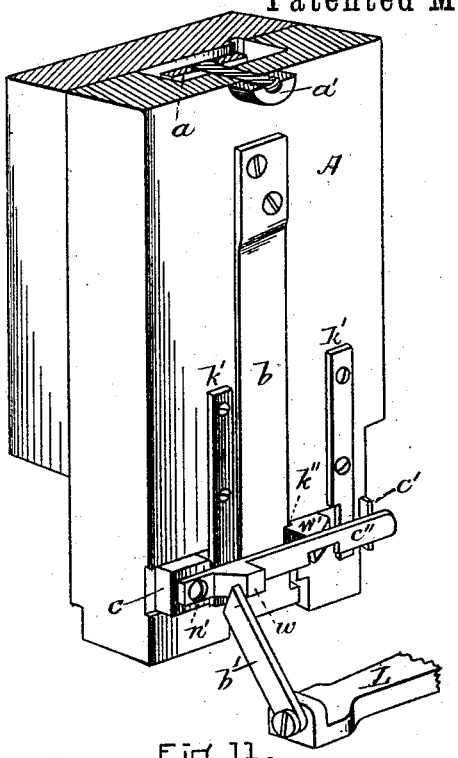

Fig. 11.

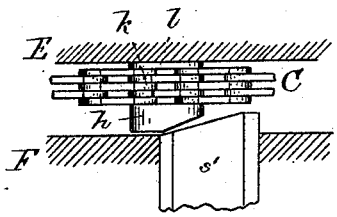

Fig. 12.

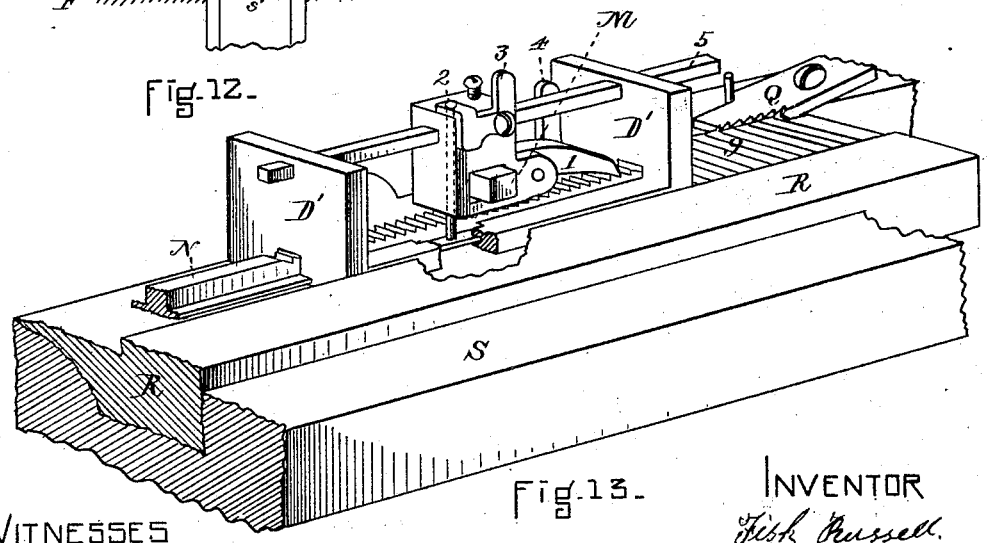

Fig. 13.

WITNESSES
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UNITED STATES PATENT OFFICE.

FISK RUSSELL, OF CAMBRIDGEPORT, MASSACHUSETTS.

TYPE-SMOOTHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,386, dated May 25, 1886.

Application filed February 19, 1885. Serial No. 156,465. (No model.)

To all whom it may concern:

Be it known that I, FISK RUSSELL, residing in Cambridgeport, county of Middlesex, and Commonwealth of Massachusetts, have invented a new and useful Type-Smoothing Machine, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section on the line *x y* of Fig. 4. Fig. 4 is a top view of the machine; Fig. 5, also a top view, with a back rest, G, and the parts attached thereto, F *b'*, right type-guide O, hopper A, and pressure-bar S' removed, and sectional view on line of the top of N of the ratchet N and attachments. The object of this view is to show the position and operation of the plates T. Fig. 6 is a cross-section of the machine on the line *x' y'* of Fig. 4. Fig. 7 is a detailed sectional view of back rest, G, and chain-guide E, to show position of plate T and spring *m*. Figs. 8 and 12 are detailed views of the chain C. Figs. 3, 9, and 11 are detailed views of the hopper A. Fig. 10 is a vertical sectional view of the ratchet N and attachments operated by lever M. Fig. 13 is the same in perspective.

The object of my invention is to provide a type-smoothing machine adapted, first, to feed the type to be smoothed to the type-smoothing device; second, to remove the fins or projecting edges of the type made by casting; third, to remove the roughness or gate upon the end of the type; fourth, to automatically arrange the type on a receiving-stick, so that they shall be ready for inspection and paging.

Hitherto the fins and gates have been smoothed off generally by hand, but in some cases by machines, which have been, so far as I know, practically unsuccessful by reason of breaking and injuring the face of the type and partially and imperfectly doing the work sought to be done.

My machine is an improvement on all other type-smoothing machines known to me, and will accomplish the labor of many hand-workers in any given period of time.

The accompanying drawings on Plates 1 and 2 are made on a scale two-thirds the size of a machine constructed by me, adjustable for the purpose of smoothing different classes of type varying from one-sixteenth to five-sixteenths of an inch in width. For type of a greater or less width the proportions of the machine would be correspondingly modified.

The practical operation of the machine and its several parts is as follows, like letters referring to like parts throughout the several views: The hopper A is made of wood or metal in two parts, adapted to fit together, but preferably connected by hinges, and in practice any number of hoppers may be used, being removable for convenience in filling the empty hoppers while the machine is in operation. One part of the hopper A is broadly grooved its entire length on the inside, and in this groove a steel side, *a*, (see Fig. 11,) is placed, which is adjustable, to allow the reception of type of different widths, by means of the screws *a'*, as shown.

In use, the side *a* having been adjusted to the required position, the retaining-spring *b* is pressed in and held in place by the rabbet *k''* in the boss *w'* on sliding catch *c*. The end of *b* projects through a slot in the lower end of *a* (see Fig. 3) in such a manner as to retain the type in the hopper. The type *f* are so placed in the hopper that when it is inserted in the hopper-holder A', and the machine is in operation, the type *f* shall fall from the holder with the nick side either up or down and the letter end toward the receiving-stick R.

After the hopper is filled the sides are closed, and it is ready for insertion in the hopper-holder A'. This holder A' may be either of wood or metal, of such shape as to allow the hopper to be inserted or removed at pleasure, and so constructed as to hold the hopper A, when in position on the machine, firmly against the end of the top type-guide, P, and to allow the bottom of the holder to rest on the chain-guides. There is a channel running through the bottom of the hopper, to allow the passage of the carriers *k* and the exit of a single type. When the hopper is in position, this channel is over the space between the two chain-guides, which space allows the passage of the carriers.

The operation of the parts about the spring *b* is as follows: *b* is held in its position, as before stated, by the rabbet *k''* in the sliding catch *c*, which is held up to its work by spring

c'. Latch c'' is connected with c by pin n', and before the hopper is fastened to the holder latch c'' is turned up and back, so as to clear it from the action of the dog b'. After the hopper is placed in the holder and the machine is ready for operation, latch c'' is turned down upon boss w', the latch having a rabbet which allows it to rest in a horizontal position when so turned down. Power is applied to the wheel B, chain-wheels W on shafts B' revolve, and chain C moves through the space between the two chain-guides and under the space through which the carriers move. On the chain, at regular intervals, are cams h and carriers k, as shown. These cams strike against the slides s s' t t', which in turn work the levers L and M, so as to give a reciprocating motion to the levers, for purposes to be explained. When any cam h strikes a slide, s', the end of the lever L nearest s' is moved out, causing the opposite end of L to move toward the hopper A, thereby forcing the dog b', fastened to L, against the beveled boss w on latch c'', as shown in Fig. 11, causing the latch, and with it the catch c, to move toward c', thereby releasing spring b from rabbet at k'. b then springs out, and the type arranged in hopper A, as described, fall in front of a carrier, k. It is, however, immaterial in what way the spring b is released, provided the first type shall not fall on one of the carriers, and the sole object of the dog b' is to release the spring b, so that the type shall fall at the moment when no carrier is under the hopper A. This is accomplished by so proportioning the spaces between the cams on the chain C that when any cam shall strike s' and cause b' to act on boss w the space beneath the hopper is entirely clear of the carriers.

After spring b is once released the type fall by their own weight into position, to be taken by the following carrier, and so on until the hopper is emptied.

The top type-guide, P, is adjusted by means of the set-screw p, to allow the passage of various sizes of type, and by its position in relation to the hopper A also to prevent the exit from beneath the hopper of more than one type at a time. The type, when taken by the carriers k, are carried over the adjustable floor-plates T, and between the back rest, G, and the type-guides O and P to and past the knives H I J K. The type (see f', Fig. 2) are prevented from falling into the space between the chain-guides, through which the carriers pass, by the floor-plates T. These plates extend from their point of contact with spring m, under the back rest, G, and cover the space through which the carriers pass, and rest in depressions o, as shown. The edges of these floor-plates, extending over this space, are slightly rounded, as shown in Fig. 5. They afford a substantially continuous surface, over which the type f' may pass; but by their peculiar shape, and being, as it were, hinged at their point of contact with the springs m, when the rounded edges are struck by the carriers k, behind the type, the plates are forced back with a slightly rotary motion in the depression o, allowing the carriers to pass with no difficulty.

The knives H I J K are so set as to form a rectangular space, through which the type are forced by the carriers k, and the top knife and right knife are adjustable by screws q q' and r r' to different widths of type. Knife K is fixed. It extends under the back rest, G, and smooths the left side of the type. Knife J smooths the under side of the type, and is attached to slide s', moving backward and forward with it in the space between F and F' by the combined action of the cams h and lever L. In order to cut the under side of the type, this knife must lie across the space in which the carriers move, and would prevent their passage, if stationary; but as soon as a type is carried over and has been smoothed by J, the cam h, (see Fig. 5,) with which the carrier moving this type is connected, strikes the slide s', moving away the slide, and with it the knife J, before the carrier reaches the knife. The cam on the carrier which takes from under the hopper the second succeeding type strikes the slide s, thereby moving lever L, and thus replaces slide s' and knife J before the next type reaches the knife.

The top and right sides of the type are cut, respectively, by knives H and I. Each of these knives is made with a long shank or body, as shown, and being set parallel with the back rest, G, they serve, together with said back rest and the floor-plates T, as guides to direct the type, after they are smoothed, to the receiving-stick R. They may each be in two parts, as shown, though I prefer them each to be in one piece.

After cutting the type are carried along between the guides by the carriers h, as shown, Fig. 2, and are delivered on a movable receiving-stick, R, upon a grooved table, S, placed at right angles to the space through which the carriers pass. This receiving stick and table may be of any length, and said stick is constructed with a shoulder across one end and along the side away from the carriers. The ends of the type as delivered by the carriers strike against the last-named shoulder, and are held in position on the stick by the two shoulders described, which may be made of wood or any material which will not injure the end of the type.

When the machine is in operation, the cams h strike the slides t t', (see Figs. 4 and 5,) which in turn give a reciprocating motion to the end of lever M, thereby operating the ratchet N and attachments. (Shown in Fig. 13.) The operation of said ratchet and attachments is as follows: Before the machine is started the pin 2 is dropped into a hole in ratchet N, and thereby connects the ratchet with the attachments, so that both are moved together by the motion of lever M. This motion causes the end of the ratchet N to operate as a pusher upon each

type as it is delivered upon the receiving-stick R, pushing each type away from the point of delivery toward the end shoulder on stick R, and leaving a clear space for each succeeding type to be deposited on said stick, and also moving the stick as it is filled with type along the groove in the table S, past the grooving-tool Q, which is adjusted to remove the gate at the end of the type by grooving out the end, in order that the type, when in use, may stand even. While passing the grooving-tool Q, the type are pressed down and held in position on receiving-stick by adjustable pressure-bar S'. When the receiving-stick R has been filled with type, since the ratchet N, operating as as a pusher, moves forward only the space of a single type, there will remain to be grooved on the last end of the stick the type which have been deposited between the end of the ratchet N and grooving-tool Q. (See Fig. 5.) In order to groove these type, the pin 2 is raised, and the pawl *l* then worked by the action of lever H in the teeth of the ratchet N, thereby giving a forward motion to the ratchet, which pushes against the last type on the receiving-stick and carries to and past Q the entire stick, thereby grooving the remaining type. The number of ratchet-teeth will be determined by the distance between the end of the space where the type are deposited on the stick R and the farther end of Q. By this arrangement of the type on R the well-known processes of inspection and paging are also greatly facilitated.

The waste metal removed by the knives and grooving falls through suitable openings beneath the machine, only one of them, *y*, being shown.

In addition to the above-described facts, referring to the drawings, D is the bed of the machine; D', frame for ratchet N and guide-bar 5. The right chain-guide is in two parts, F and F', for convenience in adjusting knife J. *g* represents type on stick R. *k' k'* are stiff springs to hold catch *c; n*, screws for springs *m; o'*, a guiding-spring to guide the type evenly to the grooving-tool Q. *q' q'* are set-screws to set H when adjusted; *s'' s''*, the same for knife I. Z Z are the supports for the machine. 3 is a lifter to operate pin 2; 4, a lifter to operate pawl 1, and 5 a guide-bar to steady the attachments to M and N when in action. *l* is a brace to keep cam *h* up to its work.

I do not mean to limit myself to the particular form of the knives H I J K or grooving-tool Q, as shown, nor to the particular form of chain C, as shown, though the construction of the knives, grooving-tool, and chain is the best now known to me, for it is obvious that the knives, grooving-tool, and chain may be variously modified without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is as follows:

1. In combination, the hopper A, adjustable side *a*, type-retaining spring *b*, and catch *c*, arranged and operating substantially as described.

2. In combination, endless chain C, having cams *h* and carriers *k*, with slides *s'* and *s*, lever L, type-guides O and P, back rest, G, movable floor-plates T, and knives H I J K, arranged and operating substantially as described.

3. In combination, endless chain C, having cams *h* and carriers *k*, with slides *t t'*, lever M, guides substantially as described, ratchet N, receiving-stick R, grooving-tool Q, and pressure-bar S', lever M being detachably secured to ratchet N, substantially as and for the purposes set forth.

4. Hopper A, provided with retaining-spring *b*, latch *c*, and catch *c''*, having boss *w*, in combination with dog *b'*, lever L, slides *s* and *s'*, chain C, provided with cams *h* and carriers *k*, and devices for guiding the type and removing their fins, substantially as and for the purpose set forth.

5. In combination, endless chain C, having cams *h* and carriers *k*, with slides *t t'*, lever M, pawl *l*, ratchet N, receiving-stick R, pressure-bar S', and grooving-tool Q, substantially as and for the purposes set forth.

6. In combination, chain C, having cams *h* and carriers *k*, with slide *s'*, carrying knife J, slide *s*, and lever L, substantially as and for the purposes set forth.

FISK RUSSELL.

Witnesses:
CHARLES W. BACON,
SAMUEL P. ABBOTT.