(No Model.)

# A. A. LOW.

## TYPE CHANNEL.

No. 360,357. Patented Mar. 29, 1887.

*Fig. 1.*

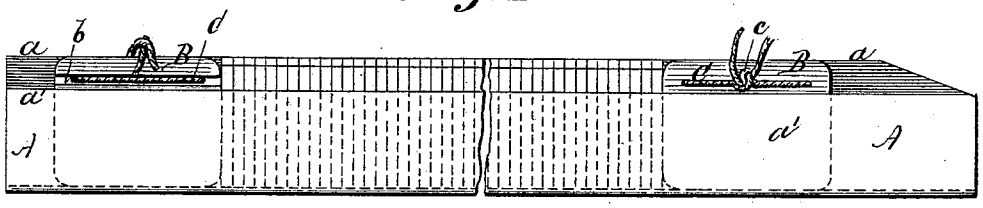



*Fig. 2.*

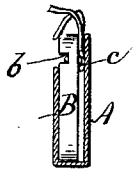



*Fig. 3.*

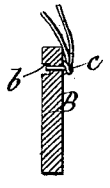



*Fig. 4.*

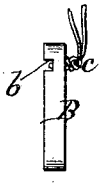



*Fig. 9.*

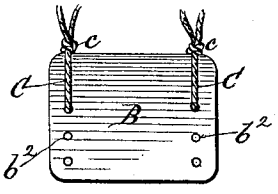



*Fig. 5.*

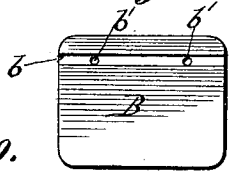



*Fig. 6.*

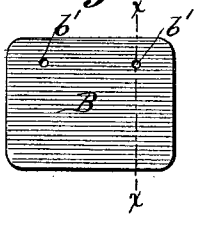



*Fig. 10.*

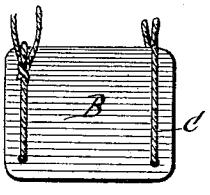



*Fig. 7.*

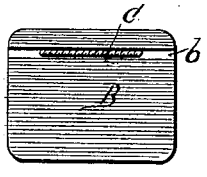



*Fig. 8.*

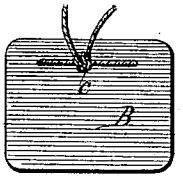



*Fig. 12.*

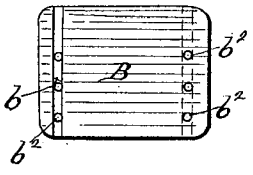



*Fig. 11.*

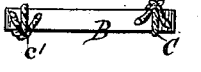



*Fig. 13.*

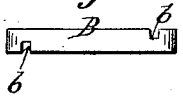
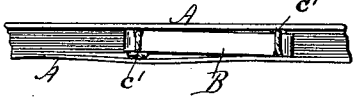



*Fig. 14.*

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# UNITED STATES PATENT OFFICE.

A. AUGUSTUS LOW, OF BROOKLYN, ASSIGNOR TO THE ALDEN TYPE MACHINE COMPANY, OF NEW YORK, N. Y.

## TYPE-CHANNEL.

SPECIFICATION forming part of Letters Patent No. 360,357, dated March 29, 1887.

Application filed May 11, 1886. Serial No. 201,881. (No model.)

*To all whom it may concern:*

Be it known that I, A. AUGUSTUS LOW, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Supporting Devices for Use in Type-Containing Channels, of which the following is a full, clear, and exact description, sufficient to enable others skilled in the art to which it appertains to make and use the same.

My invention relates to what has heretofore been designated as the "type-preceder" or "slug" used in type-containing channels for the purpose of supporting and retaining the types therein. The class of type-containing channels referred to is that into which the types are distributed successively in prescribed positions with relation to each other and to the channels, forming therein lines or columns of type resting with their broad sides against each other and with their faces all reading in the same direction. During the distribution of the types the channels occupy positions in the distributing apparatus in which they are temporarily arranged to coincide with and form continuations of permanent type receiving and conducting passages, by which the types as distributed are deposited in the receiving ends of the type-containing channels. In order to forward the types within their respective channels and clear the way for succeeding types, a reciprocating pusher or other similar device is arranged to act intermittently against the ends of the type lines or columns. This type-forwarding device acts against the resistance afforded by the lines of type already distributed and of that of the type-preceders or slugs placed in the channels to support the forward ends of the said lines of type.

In order to properly sustain the types in each type-containing channel in a close compact line, it is desirable that the type-preceder or slug shall exert a degree of resistance against movement longitudinally within the channel greater than that which would be afforded by a line of type equal to its length. In other words, the type-preceder or slug must not rest loosely within the channel, but must exert a restraining influence upon the types during and after the impulse of the type-forwarding device sufficient to prevent all looseness or play between the types constituting the line, the types being held at the other or receiving end of the line during the retractile movement of the pusher by any of the means heretofore set forth in my previous applications for patent (Nos. 192,493, 195,866, 201,104, and 201,105) for preventing "back-lash." After removal from the distributing apparatus another slug is usually inserted in the receiving end of the channel and pressed up against that end of the type-line, the latter thus being held and confined between two movable partitions, which should afford sufficient resistance to sustain the types firmly and compactly against accidental jar or disturbance during the handling and transfer of the channels.

When the types are required for the purpose of "setting" or composition, the containing-channels and their contents are inserted in their appropriate recesses or compartments within the "setter-case," as shown and described in Patents Nos. 230,784, 254,019, 271,711, 336,719, and 336,647, by reference to which it will be seen that the said recesses formed in the body of the setter-case for the reception of the type-containing channels are made as small and narrow as is practicable, so that any rigid protrusion beyond the walls of the type-containing channels would be inadmissible. Thus it is essential that the type-preceders or slugs shall in no case exceed type-height or project beyond the open edges of the type-channels; but this rule, owing to the narrowness of the channels, renders it difficult to extract or handle the slugs, and tweezers or other special implements have usually to be employed in handling or controlling them.

One of the objects of my present invention is to afford a ready and convenient means of moving the type-preceders or slugs within the channels or extracting them therefrom without interfering with the insertion of the channels into the setter-case. Any rigid handle or projection upon a type-preceder or slug would not only thus render the type-containing channel useless in connection with the

type-setter, but would also endanger the contents of the channel during handling and transfer, since by its projection beyond the edges of the type-channel it would render the slug liable to contact with extraneous objects. Another objection to such rigid handle or projection would be that during the distribution of the earlier types into the channel while in position in the distributer it would be caught and slid back away from the forward end of the line of the type each time the receiver-plate carriage was pushed back or retracted from the vertical receiver-plate, (as will be understood by reference to applications Nos. 156,604, 171,366, and 191,824,) thereby upsetting the line.

In my recent applications, Nos. 195,866, 201,104, and 201,105, I described type-preceders or slugs provided with a frictional surface consisting of a cord or band of an elastic or semi-elastic frictional material, and I do not seek to cover herein, broadly, the combination of a cord with such device. In the constructions referred to, also, provision is made for isolating the knot or fastening where cord or string is employed, whereas in my present invention the main feature consists in utilizing protuberances or knots formed upon the cord to augment and perfect the close engagement between slug and channel, and also, by increasing or diminishing the number of knots, to regulate the degree of pressure exerted by the slug against the side walls of the channel in accordance with the special requirements of the particular type under treatment, it being a fact that different sizes and kinds of type require a greater or less degree of restraint, a line of the smaller sizes of type being in the aggregate liable to present a proportionally greater degree of elasticity than a corresponding line of larger and heavier types, for the reasons set forth in my applications Nos. 201,104 and 201,105. The importance of thus regulating the resistance afforded by the preceder or slug with relation to the condition of use is of practical importance, since insufficiency of resistance to the action of the pusher will allow the latter to pitch or throw both preceder and type forward, loosening the line or column, while an excess of resistance will interfere with the perfect working of the means for preventing backlash used at the other extremity of the channel and line.

By the use of a cord or string attached to the slug or preceder I am enabled to accomplish the desired adjustment by simple and inexpensive means, since by increasing or diminishing the number of knots or protuberances thereon I can correspondingly increase or diminish the tightness or lateral pressure exerted against the side walls of the channel. At the same time such use of the cord enables me to utilize the free ends of the cord as a means of extracting the slug or preceder or of varying its position within the type-containing channel, although it is obvious that I do not limit myself to such use of the free ends of the cord for this purpose, my invention in this connection consisting in providing the slug or preceder with a flexible handle or other flexible means for grasping it and regulating its position within the channel. The flexibility of the means employed for handling or moving the slug or preceder permits of the use of the containing-channel in both the setter-case and the distributing apparatus without obstruction or interference.

The type-containing channels, being usually formed from sheet metal stamped up into the desired shape, are apt to have their side walls slightly flared apart at their upper edges. The mode of manufacture, also, is sometimes the cause of a slight "buckling" or unevenness in portions of the side walls, so that the latter are not always perfectly parallel. The side walls are also liable to become slightly bent in use, and even when such buckle, bend, or irregularity is almost imperceptible it still has a tendency to interfere with the perfect operation of the preceder or slug, the resistance afforded being in such case variable throughout the type-passage. To overcome this difficulty when present I use a slug or preceder provided with an elastic or semi-elastic frictional protuberance at each end, (and preferably upon opposite sides,) so as to insure contact with at least one end of the slug with some portion of the side wall under all circumstances, even though a lateral deviation at any given point in the channel may be sufficient in extent to avoid all pressure upon the protuberance coinciding temporarily therewith. I also form a series of vertical holes at or near each end of the slug or follower for the purpose of varying the degree of penetration into the channel of the string or other elastic or semi-elastic cord or frictional material, thereby enabling me to compensate for any spreading or want of parallelism between the side walls, which are invariably narrowest and most perfect at or near the bottom or spine.

In the accompanying drawings, Figure 1 is an elevation of a type-containing channel provided with my new form of slug with longitudinal cord, the central portion of the channel being broken away; Fig. 2, a transverse section of a type-containing channel, showing an end view of a slug or preceder and the bearing of a knot or protuberance against the side wall of the channel. Fig. 3 is a transverse section of the slug or preceder on line *x x*, Fig. 6. Fig. 4 is an end elevation of a slug or preceder in which the cord is double-knotted to increase the lateral pressure against the side wall of the channel. Figs. 5 and 6 are side elevations of opposite sides of the slug or preceder without the cord or tightener; Figs. 7 and 8, similar views with the cord applied; Fig. 9, a side elevation showing the application of a cord or tightener at each end of the slug or preceder; Fig. 10, a similar view showing the cords projecting down vertically to near the bottom of the slug or preceder; Fig. 11, a top view of the slug represented in Fig.

10; Figs. 12 and 13, side and top views of the slug or preceder without the cords, formed with vertical end grooves and series of vertical perforations coinciding therewith. Fig. 14 is a top view of a portion of a type-containing channel, in one side wall of which a lateral bend or imperfection exists, illustrating the utility of the separate end cords or protuberances.

The type-containing channels A are preferably formed from sheet metal, struck into shape in the usual way. They are usually formed with a high wall, *a*, and a low wall, *a'*, for the reasons set forth in former patents.

When used in connection with a channel having such high and low walls, the cord C may be applied to the slug or preceder B horizontally, as shown in the first eight figures in the drawings. In such the groove *b* and the perforations *b'* are formed in the slug or preceder at a point which will be above the top of the low side wall, *a'*, when the slug or preceder is in position within the channel. The groove *b* is deep enough to receive and shield the cord from contact with the side walls of the channel upon that side. The cord C projects beyond the body of the slug or preceder upon the other side, where it is secured by the formation of one or more knots, *c*, which create a thickness or protuberance at that point, constituting a semi-elastic cushion, which presses against the high side wall, *a*, of the type-channel when the slug or preceder is inserted in the position shown in Fig. 2 and upon the left-hand side of Fig. 1. Thus constructed and used in conjunction with the high and low walled channel A, the slug or preceder B may be used either as a loose slug, by reversing it in position within the type-channel, as shown upon the right-hand side of Fig. 2, or as a friction slug or type-preceder, as before set forth. In other cases the frictional material or cord C may be arranged vertically or diagonally, or in any preferred way. One, two, or more of these cords C may be used upon the body of the slug or type-preceder. I prefer to arrange one at or near each extremity, as illustrated in Figs. 9, 10, 11, and 14, for the purpose of affording more than one bearing against the side walls of the channel. By this means, should one of the cords chance to be opposite a "buckle" or depression in the opposed side wall, the slug or preceder would still be held snug and close between the side walls at its other extremity. When thus arranged at either end of the slug or preceder, the cord may be made to project upon both sides, if desirable; but I prefer to form the vertical grooves *b*, within which one side of the cord rests, and to arrange the said grooves *b* upon opposite sides of the body of the slug or preceder B, so that the bearings *c'* will bear upon opposite side walls of the channel.

A series of perforations, *b²*, coincide with grooves *b* and permit of the application or adjustment of the cords C of different length, as illustrated in Figs. 9 and 10. This is to adapt the slug or preceder more perfectly to the side walls of the channels, which are always true and of standard width near the bottom or spine, but the upper side walls of which frequently diverge more or less. By using longer cords in the channels, the side walls of which diverge materially, the cords may be made to project downward sufficiently to insure a close fit between the parts. By arranging the knots or protuberances *c* in such case near the upper edge of the slug or preceder, this result is still further insured, as the knots or protuberances may be increased until the requisite degree of tightness is attained. The free ends *c c* of the cord, besides permitting of the formation of new knots for the purpose of increasing the pressure to be exerted against the side walls of the channels, may also be utilized as means for grasping and removing or changing the position of the slug or preceder.

Any other suitable form of flexible handle may be substituted for the ends of the string, if preferred, the essential feature of construction in this respect being an elastic means for handling the slug or preceder, which will yield and adapt itself to circumstances without interfering with or obstructing any of the legitimate uses of the channel.

In my application for patent, No. 201,104, filed May 4, 1886, I show a type-preceder or slug formed with perforations for the reception of a frictional cord, and with recesses or depressions upon one side coinciding with the perforations and designed to receive and isolate the knots formed in the cord; but the object of such construction is to afford means for varying the resistance or frictional contact to be attained, and the slug is not designed to be reversible, as the present form of slug is; neither is it provided with a continuous groove and a loop or band of frictional cord.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a type-containing channel substantially such as designated, the reversible type-preceder or slug B, formed with the groove *b* and perforations *b'*, and provided with the cord C, arranged and operating substantially in the manner and for the purpose described.

2. In combination with a type-containing channel substantially such as designated, a type-preceder or slug provided with a projecting handle of flexible material, substantially in the manner and for the purpose described.

3. In combination with a type-containing channel substantially such as described, a type-preceder or slug provided with a knotted cord, the knots in which protrude upon one side of the slug, so as to bear against the side wall of the channel, the said cord being applied in such manner that the bearing or pressure exerted against the side walls of the channel may be increased by the formation of additional knots upon the said cord, substan-

tially in the manner and for the purpose described.

4. In combination with a type-containing channel substantially such as described, a type-preceder or slug provided with two frictional cords, one at each extremity, for the purpose and substantially in the manner described.

5. In combination with a type-containing channel substantially such as described, a type-preceder or slug formed with the vertical grooves *b* and series of coinciding perforations, and provided with the cords C, substantially in the manner and for the purpose described.

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