(No Model.)

J. C. FOWLER.

SPACER FOR TYPE MATRICES.

No. 470,649. Patented Mar. 8, 1892.

Fig. 1.

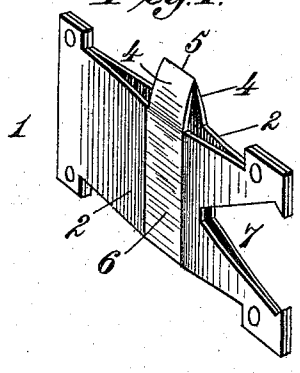


Fig. 2.

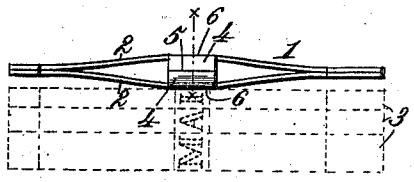


Fig. 3.

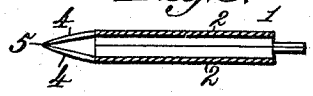


Fig. 4.

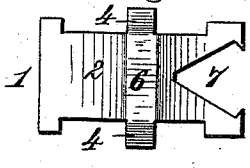


Fig. 5.

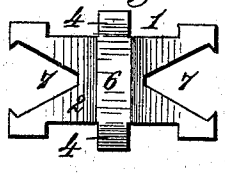


Fig. 6.

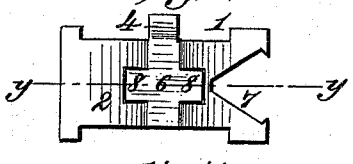


Fig. 7.

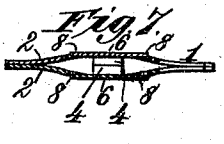


Fig. 8.

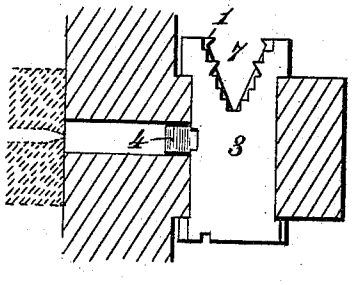


Fig. 9.

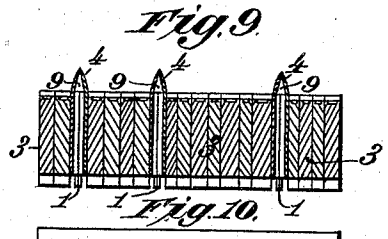
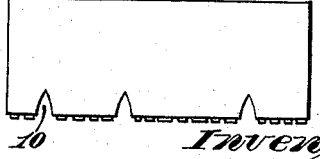


Fig. 10.



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Robt Everett,
J. A. Rutherford.

Inventor.
Joseph C. Fowler.
By James L. Norris,
Atty.

UNITED STATES PATENT OFFICE.

JOSEPH C. FOWLER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO LEMON G. HINE, OF SAME PLACE.

SPACER FOR TYPE-MATRICES.

SPECIFICATION forming part of Letters Patent No. 470,649, dated March 8, 1892.

Application filed November 3, 1891. Serial No. 410,738. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. FOWLER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Spacers for Type-Matrices, of which the following is a specification.

My invention relates to the means employed for justifying a line of matrices or matrix-plates of the kind employed for the formation by casting of type-bars, whereby the line is properly spaced throughout and the series of matrices which form part of the mold for the production of the type closed sufficiently to prevent the escape of melted metal between them or between said matrices and the justifying devices.

It is the purpose of the invention to provide a device of the kind referred to, which shall be capable of being handled mechanically and withdrawn from and returned to the magazine by devices not specially distinct from those handling the matrices. In other words, I propose to provide a compressible spacer which partakes so far of the characteristics common to all the matrices that no distinctions need be made in manipulating it in order to withdraw it from and return it to the magazine in which the spacers are placed.

It is a further object of my invention to provide a spacer which shall have a suitable and extensive range of elastic expansion and compression and a substantially uniform variation in all the spacers under compression of the line, whereby a sufficient closure of the matrices shall be effected to prevent the leakage of molten metal under an extremely slight compression of the line, thus rendering it possible to justify and close a line series of matrices in proper condition for casting the type-bar whenever the uncompressed line approximates the length usually required, a very considerable variation from the average compressed length being compatible with a perfect closure and justification.

It is a further purpose of my invention to provide a spacer having a normal expansion substantially equal to or greater than the thickness of any individual letter and a capacity for compression to a thickness equal to or less than that of the letters of least extent, said spacer having converging elastic points or nibs which rise between the intaglios of the matrix and project into and cross the mold, their edges closely abutting against the sides thereof, insuring close superficial contact with the adjacent matrix-plates between which the spacer lies, whereby the matrix is rendered tight under a comparatively light degree of endwise compression of the line, and the nibs or points having at all times perceptible convergence of their outer surfaces toward the point to enable them to withdraw easily from the casting.

It is my purpose to provide a compressible spaces composed of elastic members capable of being interposed in the rank or line series of matrix-plates, and having nibs or points crossing the matrix or mold and meeting at an apex at a point removed from the matrix, the cast-box being combined therewith in such manner as to abut against the opposite edges of the nibs or points and close the intermediate space.

It is my purpose, also, to provide a spacer capable of being withdrawn from and returned to a magazine by which it is inclosed and treated in all substantial respects like the matrix-plates, the expanding and collapsing members of said spacer being provided with nibs or points on one or both sides which cross the matrix and abut with their edges against the opposite sides of the mold or cast-box, into which they project to an apex.

It is my purpose, finally, to provide a spacer consisting of members or parts which are normally expanded or separated by their own elasticity, said members or parts being provided with elastic nibs or points projecting from their edges and converging to an apex within the cast-box or mold, said members and nibs yielding to compression of the line, and the elasticity of the nibs shifting the line of maximum elastic resistance to a point coincident, or nearly so, with the plane of the matrix, whereby the matrices are compressed with greatest force at or near those edges adjacent to the mold or casting-box.

To enable others skilled in the art to understand and to make, construct, and use my

said invention, I will now describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a spacer upon an enlarged scale. Fig. 2 is an edge view of the same. Fig. 3 is a transverse section on the line *x x*, Fig. 2. Fig. 4 is a side elevation showing a modified form. Fig. 5 is a side elevation showing a further modification. Fig. 6 is a side elevation showing a modified construction. Fig. 7 is a longitudinal section upon the line *y y*, Fig. 6. Fig. 8 is a transverse section of the line series of matrix-plates and cast-box, showing the position of the parts during the operation of casting. Fig. 9 is a longitudinal section of the line series of matrix-plates and spacers. Fig. 10 is a side elevation of a type formed in the mold shown in Fig. 8.

The reference-numeral 1 in said drawings indicates the spacer in which my invention is incorporated. For convenience of explanation I have illustrated this spacer as assimilated to the matrix-plates used in a known form of mechanism; but I do not confine the same to such specific form or construction, as it may be made without material change in such manner as to operate in conjunction with any preferred pattern of matrix-plate and in any organization of mechanism for handling the same.

The spacer 1 consists of two members or parts, which I have designated by the numeral 2. Each of these members is usually constructed of steel and substantially conforming in its shape or outline to the shape of the matrix-plates 3, in conjunction with which the spacer is used, but differing therefrom in having no Yale combination in the notched end or ends. Upon its edge, also, is a nib or point 4, preferably integral with the substance of the member 2, and so located that when the spacer is set up in the line series of matrices the nibs or points will cross the mold formed by the matrix-plates and casting-box and will project into the latter. The members or parts 2 are quite thin, and at their extremities have contact with each other, and are preferably connected by a positive fastening of suitable character—such as rivets, or by brazing, welding, or in any other manner. At the extremities where the two members or parts are brought together their thickness united does not exceed, and is preferably somewhat less than, the space occupied by the matrices of minimum thickness. From said points the plates gradually separate, until at the point of greatest expansion or separation they occupy a space about equal to, and preferably exceeding that, occupied by the thickest matrix in the same pattern of matrices. From the edges of the members 2 thus separated the nibs or points converge to an apex 5, at which their diminished ends meet. The exterior faces of these nibs or points are usually so formed as to present surfaces which are slightly convex in longitudinal section, as seen in Fig. 3. Moreover, the thickness of the nibs or points is diminished toward their points by removing a portion of the outer faces, in order that said faces may still have some divergence, even when the members 2 are compressed sufficiently to bring the inner surfaces of the nibs into contact throughout. The object of this construction is to enable the nibs or points to withdraw easily from the cast type-bar without material force being employed to effect the separation and without danger of marring or injuring the cast. The exterior face of each member or part 2 is dressed off or otherwise brought into a flat surface 6, substantially coextensive with the width of the nibs and extending from side to side, or nearly so, provided, however, that it must extend to the base of the nib, which should also have its outer face transversely flat at the base to insure a perfect closure of the matrix, as in Fig. 2. In this figure I have shown the exterior surfaces 6 as formed by dressing off the members 2 transversely, and as this method causes the corresponding portions of the members 2 to be slightly thinner than the remaining parts, it might be supposed that when under compression there would be a tendency to yield at these points. Experience shows, however, that such is not the case. The difference in thickness is very minute, and the flat surfaces 6 being supported upon and having intimate contact throughout with the matrix-plates on either side the spacer may be compressed to any degree without affecting the close contact of the two surfaces 6 with the adjacent matrices.

The spacers are stored in a magazine and are handled in a manner exactly similar to that adopted with the matrix-plates. If the latter are of the pattern shown in Fig. 8, the spacers will be substantially of the pattern shown in Figs. 1, 2, or 5, the notch 7 in the end being suitably formed to enable distribution to be effected without employing mechanism of special type.

I may duplicate the nibs or points upon the other edges of the members or parts 2 in Fig. 1, and I may also duplicate the notch 7, both forms being shown in Figs. 4 and 5, respectively; but when the matrix-plates are provided with a different construction to provide for distribution the spacer will be made to conform thereto sufficiently to enable the mechanism to handle it without requiring special apparatus.

It should be noted that by the use of the transverse flat surfaces 6 I secure such parallelism in the line series of matrix-plates and spacers that the danger of either shifting when the line is compressed so as to become cocked is avoided. I may, if desirable, extend the parallel flat surfaces laterally, as shown in Figs. 6 and 7. In this construction I slit the members or parts 2 from the parallel sides of the surface 6, or from points near said surface, toward the ends of the part

2, forming strips 8, which, being detached at their ends, form, practically, continuations of the transverse flat surface 6, as seen in Fig. 7.

When the spacers are set up in the line series, their nibs or points project from the matrix, as shown in Figs. 8 and 9. When the cast-box and matrix are united, as shown in Fig. 8, the parallel walls of the mold abut against the edges of the projecting nibs or points and close the spaces bounded by these edges, such spaces being indicated in Fig. 9 by the numeral 9. Consequently the cast type-bar will present the appearance shown in Fig. 10, the notches 10 therein being formed by the diverging curved nibs or points.

It should be noted that I may form the nibs or points of a single piece of metal bent at the apex, and the extremities of the members or parts 2 may be either disconnected or connected in part only. The members or parts 2 of the spacer being in contact at their ends and separating intermediately, their power of elastic resistance under compression of the line will be exerted with substantial uniformity at both ends of the transverse flat faces 6. By reason of the elastic resistance of the nibs or points 4, however, which meet at a little distance from the edges of the members or parts 2, a greater elastic resistance to compression will be exerted at or near the edges from which said nibs project. As these edges lie in or very near the lowest intaglios of the matrix, it will be readily seen that the maximum force will be exerted upon these parts, thus closing the matrix effectually. The elastic resistance at the other side of the spacers will be merely sufficient to prevent such unequal compression as might cause the matrices to become cocked or diverging from the matrix edges toward the opposite parallel edges. The elastic nibs or points fulfill all the conditions required for a fluid-tight closure of the cast-box or mold between adjacent matrices.

In the construction exhibited by the drawings it will be apparent that the compression of the spacer is only limited by the thickness of the two plates, as the projecting nib or point of the spacer is elastic and can be compressed. In this respect my invention possesses important advantages, as the spacer can be compressed to a degree only limited by the thickness of the plates, which is impossible where a spacer is composed of two plates, one of which is formed with a lateral flange to lie over the edge of the other.

What I claim is—

1. A compressible spacer for type-matrices, composed of normally-separated parts having elastic nibs or points to form a fluid-tight closure for the mold between adjacent matrices, substantially as described.

2. A compressible spacer for type-matrices, consisting of substantially similar nibs or points converging to an apex from the members or parts of the spacer and having outer faces which are slightly convex under all degrees of compression, substantially as described.

3. A compressible spacer for type-matrices, consisting of normally-expanded or separated parts provided with flat transverse surfaces and with converging nibs or points projecting from the edges of said parts and having the width of the mold, substantially as described.

4. A spacer for type and other similar matrices, consisting of members or parts capable of compression and having converging nibs or points which project from the said members or parts and cross the mold, said members or parts being substantially assimilated in form to the matrices with which they are used to enable them to be handled without special mechanism, substantially as described.

5. A spacer for type and other similar matrices, consisting of two members having contact at their extremities and separated throughout the intermediate portion, said members being provided with elastic nibs or points converging to an apex and crossing the mold, into which they project, in combination with a series of matrices and a cast-box, the parallel walls of which lie close to the edges of said elastic nibs or points and form a fluid-tight closure for the mold between adjacent matrices, substantially as described.

6. A spacer for type and other similar matrices, consisting of compressible members or parts having contact at their ends and separated intermediately, said members being provided with nibs or points which cross the mold and project therein, their edges abutting against the opposite walls of the mold, said nibs converging to an apex and diminishing in thickness toward the point of convergence, their exterior faces being slightly convex longitudinally, substantially as described.

7. In type-casting apparatus, the combination, with a series of matrices, of a casting-box or mold, and spacers having compressible converging nibs or points crossing the mold to form a fluid-tight closure for the latter between adjacent matrices, substantially as described.

8. A spacer for type-matrices, consisting of two elastic members or parts united wholly or in part at their extremities and separated intermediately, their edges provided with elastic projecting nibs or points adapted to cross the mold or casting-box and converging to an apex, whereby upon compression of the line series the maximum elastic resistance of the spacer will be exerted at or near the edges from which the nibs or points project, substantially as described.

9. The combination, with a series of type-matrices, of spacers composed of members or parts having such resemblance to said matrices as to permit them to be handled without special mechanism, said members or parts being united at their ends and separating

intermediately their outer faces, provided with transverse flat surfaces and their edges having nibs or points projecting into the mold or cast-box and converging to an apex, in combination with said mold or cast-box, the opposite walls of which lie close to the edges of said nibs, substantially as described.

10. A spacer for type-matrices, consisting of two elastic members or parts united at their extremities and separating intermediately, said parts being provided with converging nibs or points projecting from their edges and having flat exterior transverse faces and longitudinal extensions thereof, consisting of strips detached from said members or parts at one end and both sides and having their outer faces substantially in the plane of the flat transverse faces, substantially as described.

11. Spacers for type-matrices, having elastic nibs or points which project from the matrix and cross the mold or cast-box to form a fluid-tight closure for the latter between adjacent matrices, substantially as described.

12. A compressible spacer for type-matrices, provided with an elastic compressible projecting nib or point to form a fluid-tight closure for a mold between adjacent matrices, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

JOSEPH C. FOWLER. [L. S.]

Witnesses:
ALBERT H. NORRIS,
JAMES A. RUTHERFORD.