No. 618,800. Patented Jan. 31, 1899.

C. R. MURRAY.

SERPENTINE OR CRIMPED TYPE SPACE.

(Application filed Feb. 24, 1898.)

(No Model.)

Fig. 1.

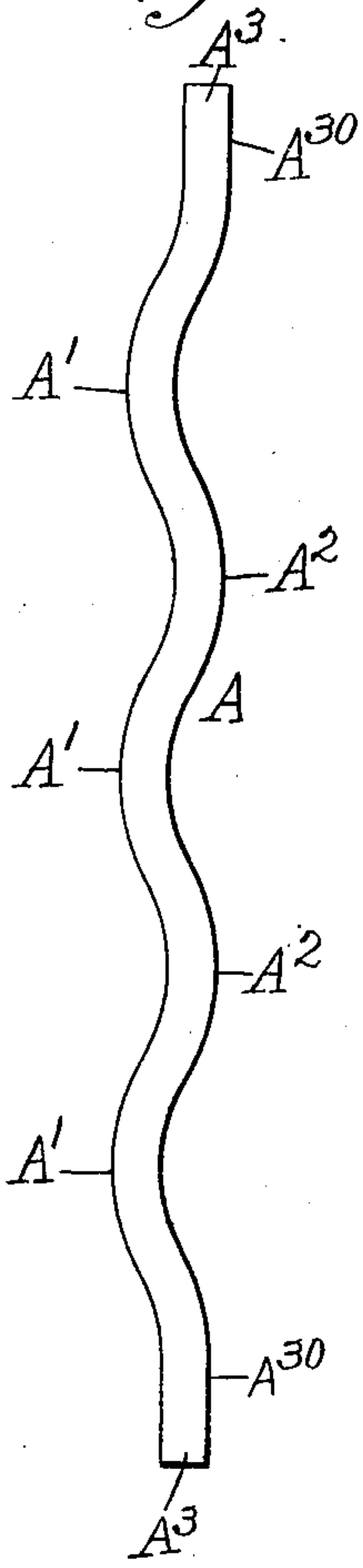


Fig. 3.

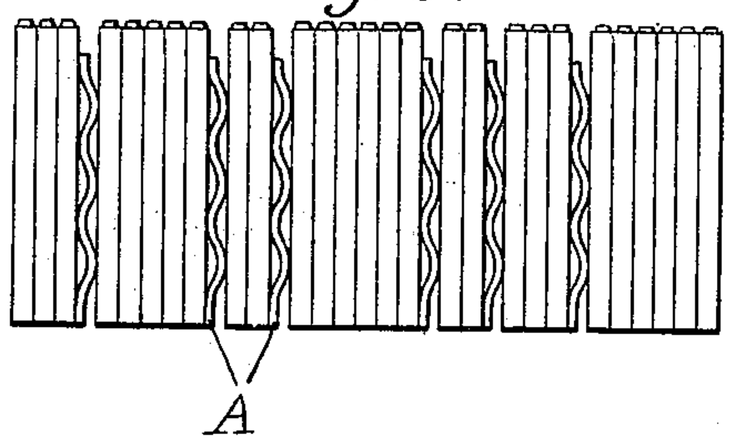


Fig. 2.

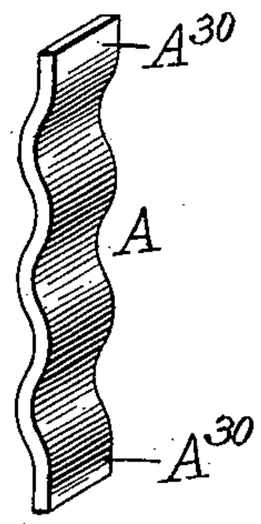


Fig. 4.

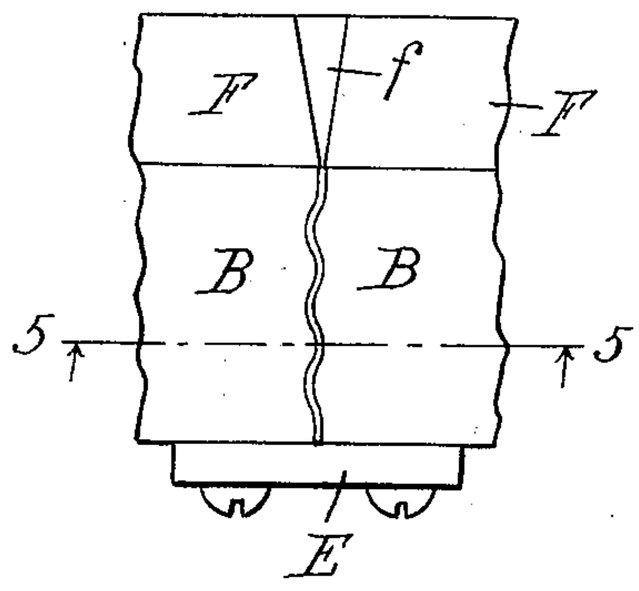
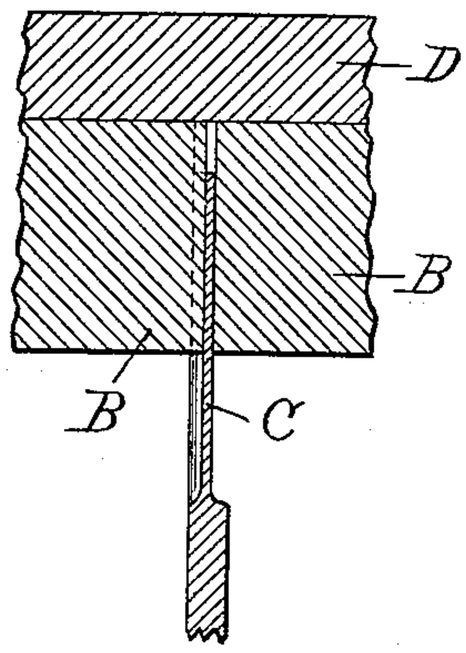


Fig. 5.



Witnesses:
Edward T. Wray.
Harry White.

Inventor.
Charles R. Murray
by Burton & Burton
his attys

UNITED STATES PATENT OFFICE.

CHARLES R. MURRAY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE BARNHART BROTHERS & SPINDLER, OF SAME PLACE.

SERPENTINE OR CRIMPED TYPE-SPACE.

SPECIFICATION forming part of Letters Patent No. 618,800, dated January 31, 1899.

Application filed February 24, 1898. Serial No. 671,437. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. MURRAY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Serpentine or Crimped Type-Spaces, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to a certain form of space which is used for the purpose of automatic justifying in composing type and is principally employed in type setting or composing machines. The general characteristic of spaces of this class is that they are serpentine or non-rectilinear longitudinally and adapted to be compressed by lateral pressure applied longitudinally with respect to the line of composition in which the space is set. These spaces have heretofore been made exclusively by forming tape of suitable soft metal of width approximately equal to the bodywise dimension of the type, the same being cut into proper lengths and crimped by pressure between dies of suitable form. Great difficulty has been experienced in this mode of production of such spaces, in the first place because the metal for producing such spaces must be soft enough to endure straightening caused by lateral pressure upon the space without fracture, and metal of this character cannot be, or at least hitherto has not been, successfully produced by running it hot through a die or port of proper shape, because the slightest variation in temperature of the die causes a thinning or thickening of the tape, and it cannot be produced by rolling or drawing cold because of the tendency to tear or flake, which causes the spaces to yield a flaky powder or dust in the process of use, which is seriously damaging to the machine in which they are used and objectionable for other reasons. Neither has it been found practicable to produce such tape by cutting the same in strips from sheets, because the cutting process leaves a feather, thread, or fillet at the cut edge which must afterward be dressed away in some manner in order to adapt the space for its purpose. The most nearly satisfactory metal tape for this purpose thus far produced is made by first running the metal into a cylindrical rod and then rolling such rod flat to form the tape. This process, however, gives the tape a rounded edge and slightly deficient uniformity in width, both of which defects tend to prevent the space being securely held in the form when it is locked up. To overcome all these objections and produce a space accurate in its form and absolutely reliable in its texture, stiffness, and pliability, I make a mold in which such spaces may be cast from soft metal, and I employ for this purpose a special composition much softer than any type-metal composition. As spaces of this sort and for this purpose have heretofore been made their longitudinal outline has comprised a plurality of inflections ending in a straight portion located in a plane midway between the planes of the crests or nodes of the inflections. This form has been found objectionable for reasons which I will point out, and my present invention involves a different form, which is shown in the drawings and will be fully explained.

In the drawings, Figure 1 is a greatly-enlarged edge elevation of my improved space. Fig. 2 is a perspective of the same on a reduced scale, but still greatly enlarged beyond type size. Fig. 3 is a side elevation of a portion of line composition in which my improved spaces are set. Fig. 4 is a plan of the mold for casting my improved space with one side removed. Fig. 5 is a section of such mold at the line 5 5 on Fig. 4.

A is my improved space. As illustrated, it is serpentine in longitudinal—that is to say, vertical—section in the plane of the running-wise dimension. As illustrated, it comprises three inflections $A' A' A'$, having their crests at one side, and two intermediate inflections $A^2 A^2$, having their crests at the other side, the end portions $A^3 A^3$ being straight and having one face A^{30} in the plane of the crests or nodes of the inflections A^2. The number of inflections is immaterial, provided only there be a plurality of crests at each side. From this form it results that when the space is set in a line of composition the type at one side bear directly against the faces $A^{30} A^{30}$ at the ends. The space is designed to be set with this side toward the last preceding type, and by reason of the bearing at the ends all

danger of tilting the type as the line is compressed is avoided, such tilting being the defect which is observed in the use of crimped spaces in which the straight portion is formed between the planes of the opposite crests or nodes of the inflections. I prefer to produce these spaces in a mold such as is shown in Figs. 4 and 5, wherein two opposite cheeks B B have their opposed faces longitudinally serpentine in form and are spaced by a follower C of like form, which forms a third side of the body, a fourth side being formed by a plate D, which is adapted to slide or otherwise move from that side, the cast being ejected by thrusting movement of the follower C in the direction of the bodywise dimension of the space between the serpentine faces of the cheeks B B. One end of the mold-cavity may be closed by the plate E and the other end provided with jet-pieces F F, having the customary metal inlet or jet port *f*. This mold may be operated in any suitable machine.

My improved space, produced by casting, as described, can be readily distinguished from a space even of the same form made in the ordinary manner by reason of the different character of the surfaces, which are without marks either of the rolling or trimming or drawing processes which are necessarily employed in making such spaces by the old method.

I claim—

1. A cast space which is vertically serpentine in the plane of the runningwise dimension.

2. A type-space which is vertically serpentine in the plane of the runningwise dimension and has at the upper and lower ends straight portions, of which one face is in the plane of the crests or nodes of the intervening inflections at one side.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 19th day of February, 1898.

CHAS. R. MURRAY.

Witnesses:

CHAS. S. BURTON,

JEAN ELLIOTT.