

No. 836,385.

PATENTED NOV. 20, 1906.

O. C. KAVLE.
FINGER KEY FOR KEYBOARD INSTRUMENTS.
APPLICATION FILED OCT. 6, 1905.

Fig. 1.

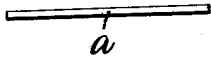


Fig. 2.

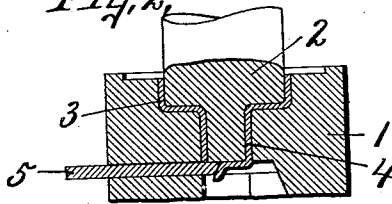


Fig. 3.

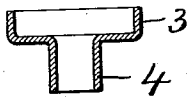


Fig. 4.

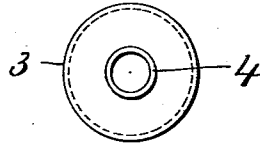


Fig. 5.

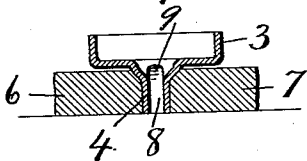


Fig. 6.

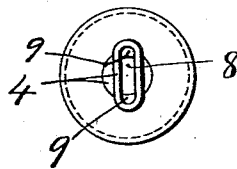


Fig. 7.

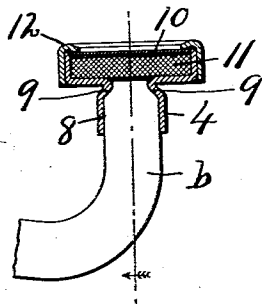
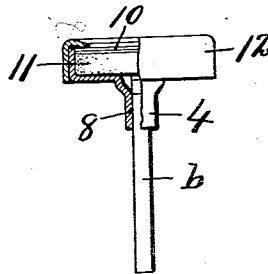


Fig. 8.



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FINGER-KEY FOR KEYBOARD INSTRUMENTS.

No. 836,385.

Specification of Letters Patent.

Patented Nov. 20, 1906.

Application filed October 6, 1905. Serial No. 281,655.

To all whom it may concern:

Be it known that I, OSCAR C. KAVLE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Finger-Keys for Keyboard Instruments, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the manufacture of finger-keys or manuals as a new commercial article adapted to be made and sold as such to be applied to the key-levers or analogous parts of type-writing machines and other keyboard instruments to receive and support the different characters.

My object is to make the character-receiving cup and its supporting-stem from a single piece of comparatively light sheet metal which may be stamped or pressed to the desired form by a minimum number of operations for the purpose of reducing the cost of manufacture and at the same time producing a key having a neat external finish free from joints and capable of being easily attached to or detached from the end of the key-lever or equivalent support, so that the character may be quickly changed or rearranged when desired.

A further object is to make the integral tubular shank of the cup of comparatively small diameter and to compress or flatten it in such manner as to leave a transversely-elongated opening through the greater portion of its length, so that its long diameter is greater than the interior diameter at the junction of the shank or stem with the cup, thereby forming a tapering shoulder adapted to wedge upon the end of the key-lever and to frictionally hold the parts together.

Other objects and uses will be brought out in the following description.

In the drawings I have shown the several steps in the manufacture of the key or manual, and in which—

Figure 1 is an edge view of the sheet-metal blank. Fig. 2 is a sectional view of the cup and its shank as first pressed or stamped and the dies which produce such form. Figs. 3 and 4 are respectively a sectional view and an inverted plan view of the cup and shank after leaving the dies. (Seen in Fig. 2.) Fig. 5 is a sectional view. Fig. 6 is an inverted plan of the completed key-cup and its

flattened shank, showing in Fig. 5 the dies for compressing or flattening the shank. Figs. 7 and 8 are respectively side and end views of a key-lever and my improved key-finger as attached thereto, said key being partly in section in each view.

In carrying out the objects stated, a sheet-metal blank *a* is pressed between two dies of suitable formation, as a matrix 1 and patrix 2, whereby the blank is stamped or pressed into the form of a cup 3, having a central tubular shank or extension 4 of less diameter than the cup, the lower end of the shank being left closed by the first operation of the dies 1 and 2, but is subsequently severed or removed by an additional die, as a cutter 5, Fig. 2, thus leaving the shank with a tubular opening of substantially the same area or diameter from end to end.

The tubular shank of the cup is then held between suitable dies 6 and 7, by which it is uniformly flattened or compressed from a point close to the bottom of the cup to its extreme outer end, thus forming a lengthwise opening 8, which is elongated or wider transversely in one direction and narrower at right angles to such direction than the original opening or where it joins the cup. This manner of flattening or compressing of the tubular shank produces oppositely upwardly converging or tapering shoulders 9, which not only serve to limit the sliding movement of the key or manual upon its key-lever, but also operate to center and to hold the manual upon its support with a wedging friction or slip-joint fit, it being understood that the end of the support, as the key-lever *b*, is made to correspond in size and taper to snugly fit into the opening 8.

The shank 4 is made of sufficient length or depth and its opening 8 of such size as to lap and fit some distance upon the sides and edges of its key-lever to prevent vibration or rocking movement of the manual when properly applied to its key-lever.

The wedging or friction fit, together with the limited sliding movement of the cup and its shank upon its key-lever, enables all of the manuals to be brought and maintained at the proper uniform height, and the fitting of the flattened portion of the shank upon a correspondingly-shaped end of the key-lever serves to prevent accidental rotation of the cup, and therefore always keeps the charac-

ters in a correct readable position. These characters may be printed upon celluloid or equivalent disks, as 10, which are adhesively or otherwise secured to a pad 11. The pad and its disk are in turn suitably fitted in and seated upon the bottom of the cup 3 and are held in place by a sheet-metal annulus or retainer-ring 12, which telescopes with and is fitted upon the open end of the cup 3 and overhangs the adjacent edge of the character-pad.

The construction and application of my improved key or manual are now believed to be sufficiently clear to enable any one skilled in the art to make and use the same, and while I have shown and described a key-lever and character-supporting pad, the invention lies more particularly in the formation of the cup and its shank in one piece of sheet metal and in the flattening of the shank to form a tapering socket or opening, whereby its sliding movement on the key-lever is limited. The key is self-centering and is retained solely by friction.

What I claim is—

1. In a finger-key or manual, a cup and shank formed from the same piece of metal, the shank being flattened below its junction with the cup leaving a lengthwise opening elongated transversely.
2. In a finger-key or manual, a cup and tubular shank formed from the same piece of metal, the tubular shank being of greater width in one direction at its base than at its junction with the cup.
3. In a finger-key or manual, a sheet-metal blank having its marginal edge struck up in one direction and its central portion pressed out in the opposite direction and having a lengthwise opening of greater width in one direction at its base than at its junction with the cup.
4. In a finger-key, a piece of sheet metal having its marginal edge struck up in one direction forming a cup and its central portion struck up in the opposite direction forming a tubular shank, the latter having its outer end

compressed to a less width than its inner end forming limiting-shoulders to limit its sliding movement on its supporting-key.

5. The combination with a key lever or stem, of a key consisting of a cup having a shank of smaller diameter made to surround the end of the lever or stem, the cup and its shank being made of a single piece of metal.

6. The combination with a key lever or stem, of a key of two diameters formed in a single piece of metal, the larger diameter being adapted to receive a character, and the smaller diameter to receive the end of the lever or stem.

7. The combination of a key lever or stem, of an integral key of two diameters, the smaller diameter being adapted to form a rigid slip-joint with the lever or stem, and the larger diameter to receive a character.

8. The combination with a key lever or stem, of a key consisting of a cup having a flattened shank to fit the stem or lever, the cup being of larger diameter than the shank and formed integral therewith.

9. The combination with a key lever or stem having a tapering end, of a key consisting of a cup having an integral shank of smaller diameter than the cup arranged to fit the tapering end of the lever or stem.

10. The combination with a key lever or stem, of a key of two diameters formed of a single piece of sheet metal, the larger diameter being adapted to receive a character, and the smaller to receive the lever or stem.

11. The combination with a key lever or stem, of a one-piece sheet-metal key of two diameters forming a shank adapted to receive the lever or stem in its smaller part, and a character in its larger part, with an annular cap to secure the character within the larger part.

In witness whereof I have hereunto set my hand this 3d day of October, 1905.

OSCAR C. KAVLE.

Witnesses:

E. G. LATTA,
H. E. CHASE.