A pick tool comprises a metal pick head and a wooden handle secured in the eye of the head. The eye and the outer end of the handle, that is the portion of the handle that engages with the eye, are flared outwardly. Usually also the cross-section of the flared portion of the handle and the eye is elliptical, with its major axis lying in the direction of the length of the pick head.

This invention which is a continuation in part of application 440,734, filed April 27, 1942, relates to wood handles for picks, hoes and other tools, which are outwardly flared as described above and the flared end of which is fitted with a metal ferrule so that the eye engages with said ferrule and not directly with the wood of the handle; said ferrule being itself outwardly flared both internally and externally. It is essential for the successful use of the pick that such ferrule shall remain rigidly fixed to the wood handle.

The invention is illustrated in the accompanying drawings in which:

Figure 1 is a perspective view showing the end portions of a pick handle, and a pick head.

Figures 2 and 3 are respectively an elevation and an end view of the ferrule blank for the head of the handle.

Figure 4 shows dies shaping the ferrule.

Figure 5 is a perspective view of a prospectus's model constructed according to the invention.

Figure 6 shows the corresponding ferrule blank.

In the drawings 2 indicates a pick head with the usual eye 3 for receiving the handle. Said eye is roughly elliptical in its cross-sections and flares in the direction from its inner end 4 to its outer end 5.

6 indicates the wooden handle having an outer end portion 7 on which the ferrule 8 is firmly mounted. The ferrule is shaped externally to engage the eye 3 and is accurately of much the same elliptical cross-sectional and lengthwise flaring form as the eye. The ferrule wall being of much the same thickness throughout, the handle end portion 7 also has approximately the same elliptical and flaring form as the eye 3 and as the external surface of the ferrule.

In some pick handles having this elliptical cross section the flare is present principally in the plane including the long axis of the ellipse, and in others principally in the plane at right angles thereto, that is the plane including the short axis. The end 7 shown is of the last mentioned form, the short diameter 8 at the extremity being greater than the short diameter 10 at the base of the flare; but the end being materially of uniform width across its long diameter 11.

The flare extends outwardly from a waist 12; said waist being constituted by the cross section of the wood at the base of the flare being diametrically smaller than both said flared end and the portion 13 of the wooden handle which lies on the other side of the waist from the flare. In some pick handles said handle portion 13 flares away from the waist; and sometimes the cross-sectional forms of the flared end and of said handle portion 13 respectively are such that the waist does not lie in a plane transverse to the length of the handle. In the instance shown, the portion 13 is flared reversely from the flared end 7 and the waist 12 is formed by the juncture of the flared end 7 with a well defined shoulder 14 in said portion 13; which shoulder lies in one plane and against which the inward end face 15 of the ferrule seats. Also, in the example shown the waist is both diametrically and circumferentially less than the flared end 7 and the handle portion 13.

The close fitting of the ferrule 8 on the flared wood end 7, with its smaller end 16 seated in said waist 12, accordingly locks the ferrule positively against endwise movement on the handle in either direction.

In present practice the manufacture of the ferrule 8 in its flaring shape is completed before it is assembled with the wood handle. Also the outer end portion 7 of the handle is not originally flared, but is made of such shape and size that the pre-formed ferrule can be passed over it, in the direction indicated by the arrow A until the smaller end 16 of the ferrule engages the waist 12. The flaring of the outer end portion of the handle on one or both the axes of the ellipse, to lock the ferrule in such position, is then effected by driving a wedge or wedges into a slit previously cut in from the outer end of the handle. The weakness of this construction lies in the wedge, which is apt to loosen and cause loosening of the ferrule.

It is the object of the invention to avoid such loosening of the ferrule. According to the invention the handle or at least the head end thereof is provided, before its assembly with the ferrule, in its final form comprising the flaring end 7, the enlarged portion 13 and the waist 12 between them; said waist 12 being of solid wood.

The ferrule is provided, prior to the assembly, as a ferrule blank 17; Figures II and III, which is tubular in the sense that it has circumferential continuity, though not necessarily at all cross sections. The blank is of such diametral dimensions as to pass easily over the pre-formed flared end 7 and to its final position in which it surrounds said waist 12 and said waist 12. When so positioned its shape is changed to conform to that of the flared end and the waist and so that it fits said parts.

In practice it is convenient to use circular tube stock, preferably solid drawn tube. A piece of this is cut to the intended length of the ferrule, and is pressed in parallel dies to make its cross-sectional form throughout the elliptical cross-
sectional form and size of the extremity 18 of the handle; the diametral dimensions of the circular tube having been chosen suitably for that purpose. The resulting parallel, elliptical-sectioned, and tubular blank 17—shown in Figures II and III—is then assembled with the wood handle.

The conformation of the parallel blank 17 to the wood handle comprises the reduction of diametral dimensions of the blank in progressively increasing degree in the direction from its outer end to its inner end; and usually it consists specifically in similarly progressively reducing the circumferential dimensions of the blank.

One method of effecting such circumferential diminution is by pinching up the superfluous circumferential extent into folds 19, the length 20 of which extends lengthwise of the blank and the depth 21 of which varies progressively along the length in order to absorb the increasing amount of superfluous ferrule wall material corresponding to the decrease of circumferential extent of the flared end 7 towards the waist 12.

In order that these folds may be produced without interfering with the general smoothness of the external surface 22 of the ferrule on which the internal surface 21 of the eye 3 bears when the handle and pick head are assembled, the folds are formed at the extremities of the long dimensions of the ferrule. It is customary to shape the eye of the pick so that its ends in the direction of the length of the pick provide clearance spaces 22 which are not occupied by the ordinary ferrule, and in which the aforesaid end folds can be accommodated without affecting the regular wedging seating of the eye on the ferrule. In other cases the eye is specially shaped to receive the folds 19.

The shaping of the ferrule blank to the flaring end of the handle and the formation of the folds may be effected by means of dies 23, Figure IV. Said dies are formed with end clearance spaces 24 which give space for the folds 19 and terminate at somewhat sharp edges 25 which bite into theblank metal as the dies close together and so have the effect of tensioning the ferrule well metal around the side faces of the flaring end.

Another method of contracting the circumferential dimensions of the tubular blank is by the formation in the tubular blank of gapping that removes some of the metal; and the circumferential closing together of the edges of the gapping in the step of shaping the ferrule to the flaring wood end. In the example shown in Figures V and VI, the eye of the head of the prospectors' gad differs from that of a pickaxe in being of smoothly curved form in transverse section. The tubular blank 26 is provided with gapping consisting of longitudinal slots 27 extending from the inner end 28 of the ferrule but terminating short of its outer end 29. The slots widen towards the inner end of the ferrule so that the amount of ferrule material left between the median lines of the gap diminishes in that direction. The thus pre-formed blank is passed onto the flaring end of the handle and the ferrule is pressed by dies to conform its shape to that of said flaring end; such shaping bringing the opposite edges 30 of the slots closer to one another.

To retain against separation the portions of the inner end of the ferrule that are separated by the slots, they are secured to the head by the rivet 31 which passes through both portions and the head.

A pick handle is commonly provided with a ferrule 32 at its inner or lower end in order to protect such end against being split or mushroomed when it is struck on the ground for the purpose of loosening the pick head. According to the invention said ferrule 32 is fixed in the same way as the head ferrule 8, viz. by flaring the wood end 33 from a shoulder 34, passing onto it a parallel tubular ferrule blank and conforming said blank to the flared end, as described above.

As the ferrule 32 is much shorter than the head ferrule 8 and the gain of diameter of the flare is correspondingly smaller it is preferred to secure the ferrule 32 additionally as by splitting the upper rim of the ferrule 32 at 35 and driving the tongues 36 so formed into the wood of the handle. The ferrule 32 may be also additionally secured by a rivet 37.

It will be noted that no expansion of the handle end is required, and consequently there is no wedge to loosen.

I claim:

A wood tool handle having a solid and outwardly flared end extending from a waisted and a similarly flared tubular ferrule fitting on said flared end and said waisted; the cross-section of the flared end and of the ferrule being basically elliptical; the ferrule comprising longitudinally extending folds formed in its wall, said folds being at the ends of the long axis of the elliptical formation and being of progressively varying depth in the direction of the length of the handle.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>379,439</td>
<td>Bell</td>
<td>Mar. 13, 1888</td>
</tr>
<tr>
<td>1,914,802</td>
<td>Crichan</td>
<td>June 20, 1933</td>
</tr>
<tr>
<td>2,132,855</td>
<td>Baxter</td>
<td>Oct. 11, 1933</td>
</tr>
<tr>
<td>1,339,908</td>
<td>Velchansky et al.</td>
<td>May 11, 1920</td>
</tr>
<tr>
<td>2,190,258</td>
<td>Berliner</td>
<td>May 30, 1939</td>
</tr>
<tr>
<td>2,211,147</td>
<td>Miller</td>
<td>Aug. 13, 1940</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Britain</td>
<td>Jan. 15, 1894</td>
</tr>
<tr>
<td>Germany</td>
<td>Apr. 10, 1886</td>
</tr>
</tbody>
</table>