

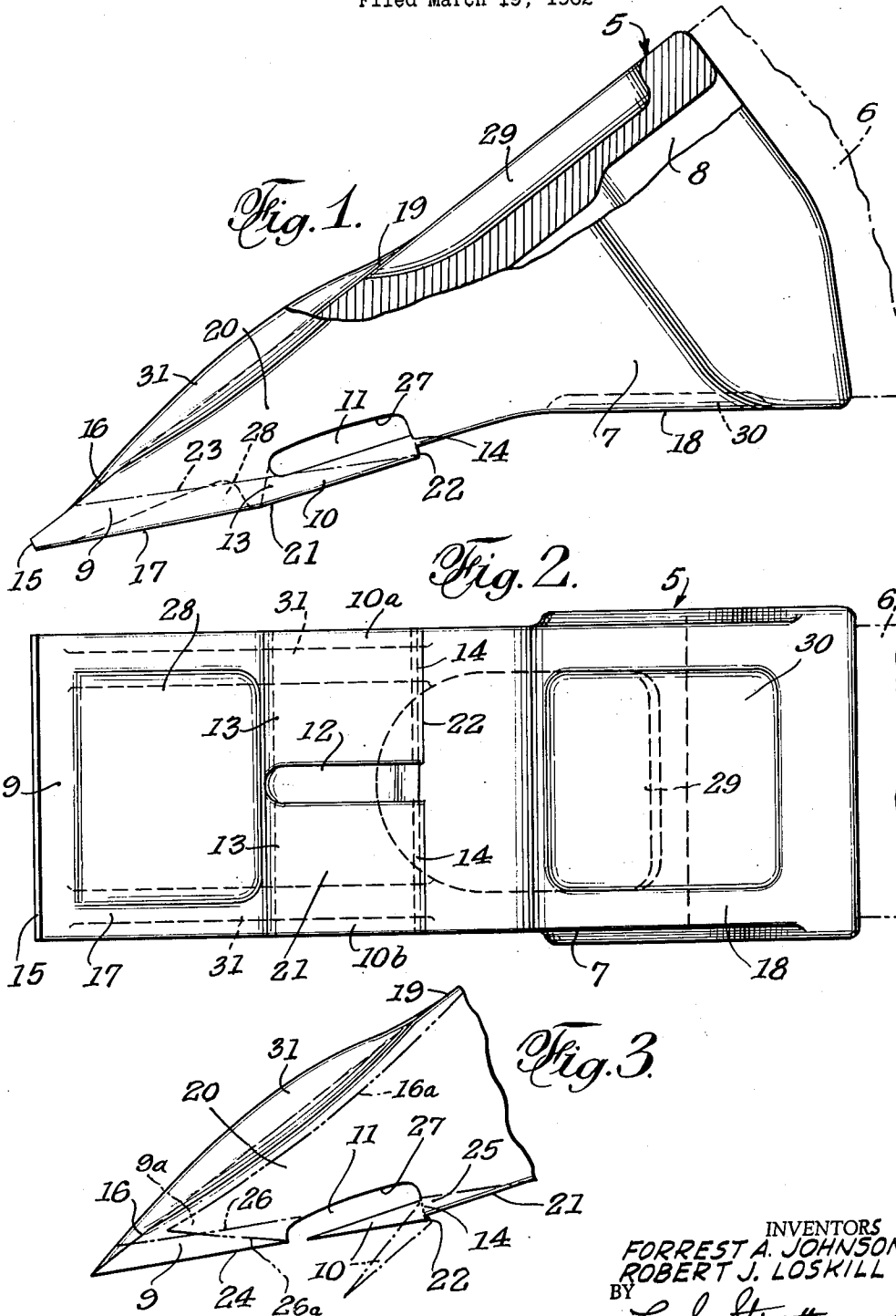
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RIPPER POINT WITH BREAKAWAY PORTION

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RIPPER POINT WITH BREAKAWAY PORTION

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This invention relates to a ripper point structure, the same being adapted to be used on the end of the tine or standard of an earth-breaking machine.

Ripper points are conventionally made as hardened replaceable members because the wear thereon, when moving through compacted or rock-included earth, is such that the same wear away rapidly and, for maximum efficiency, require frequent replacement. Wear alone is not the primary reason for frequent replacement, rather that the earth-penetrating point becomes too dull and the horsepower needed to pull the same through the earth in a ripping operation is quite great and, therefore, uneconomical.

Accordingly, an object of the present invention is to provide a ripper point that has efficient earth-ripping sharpness even after considerable removal, by wear, of the original ripper point thereof.

Another object of the invention is to provide a ripper point that has an integral portion that is adapted to break away from the main body of the point to reform the point, when worn and dulled, to a more efficient, more-pointed earth-breaking form.

The contemplated ripper point is integrally cast or forged and, therefore, the invention is characterized by low manufacturing cost, great strength for the intended purpose, and dependable use, since there are no separated fall-away parts that may become dislodged prematurely.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description and which is based on the accompanying drawing. However, said drawing merely shows, and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a partly broken side elevational view of a ripper point according to the present invention and shown in the condition thereof before wear has taken place.

FIG. 2 is a bottom plan view thereof.

FIG. 3 is a side elevational view of the point, as worn away in use and showing the breakaway portion of the process of being broken away.

The present ripper point 5 is shown as affixed to the lower end of a tine 6, the latter being merely suggested because the same forms no part of this invention. It is usual for the tine to be so formed as to impart to the ripper point 5 a forwardly directed disposition, substantially as shown. It will be understood, of course, that the present point may be used in agricultural machines, as an earth-working tooth, as well as in machines that break up soil for subsequent removal.

The present ripper point 5 comprises a triangular body 7 that has an interior hollow 8 for the end of tine 6, the

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same being formed with an apex 9 rearward of which and on the lower side of the body 7 is integrally provided a breakaway portion 10. A transverse elongated opening 11 defines the upper face of the portion 10. Although the breakaway portion may extend for the full width of the point, the same is here provided with a longitudinal slot 12 midway of the side faces of the point and dividing said portion 10 into two similar sections 10a and 10b which, because they are narrower than a full-width portion, break away more easily than a full-width portion; yet, such a divided breakaway portion 10a, 10b is strong and resistant to premature bending or breaking when the connections at 13, at the front end, and at 14 at the rear end, remain intact. It is only when the connections 13 wear away that the portion 10a, 10b breaks away as will be described.

The body 7 is advantageously formed of a tough, wear-resistant steel that, as shown in FIG. 2, has such width that the apex 9 has a chisel edge 15. The apex, as in FIG. 1, is in its unworn condition and is included between respective upper and lower faces 16 and 17 that define between them an acute angle that is approximately 20° to 25°, 22½° being exemplary.

The body 7 has a lower face 18 that is disposed at an angle to the mentioned lower face 17 of the apex, the angle being forwardly downward from the face 18. The upper face 16 may extend, without change of angle, as the upper face 19. Therefore, the included angle between the body faces 18 and 19 is greater than the angle included between the apex faces 16 and 17. It will be evident that if the apex 9 were worn worn away, the remaining part of the body 7 would present an apex substantially more blunt than the original apex 9, the same having a more obtusely angled form. Blunting of the earth-ripping apex will, of course, reduce the efficiency of the ripper point.

The unitary breakaway portion 10 or the section portions 10a, 10b is provided in a transition portion 20, which is between and integrally joins the apex 9 and the body 7. The mentioned top face 19 defines the top of said transition portion 20, and a face 21, extending between the bottom faces 17 and 18, defines the bottom of said portion 20. As can be seen in FIG. 1, the face 21 also constitutes the lower face of the breakaway portion 10, or 10a, 10b, as the case may be. In this case, a rearwardly facing step 22 is formed in the face 21 where the connection 14 is located. It will be noted that the opening 11 is generally parallel to the face 17, 21 of the apex.

It will be clear from the foregoing that the portion 10, or 10a, 10b, is a part of the transition portion 20 with the opening 11 therein, and the same provides a thick part that resists deflection of the apex 9, in use. It will be seen, however, that, between the face 19 and the opening 11, said part 20 has an included angle that approximates the angle of the apex 9.

When the present point has its apex 9 worn away to the line 23 of FIG. 1, the apex 9 will now have a lower face 24 and enough of the breakway portion 10 or 10a, 10b will be worn away to break the connection at 13. This leaves an efficient ground-ripping apex that is quite sharp at its edge and is materially thinned in the portion 20 due to the separation of said portion from the breakaway portion. The latter may be broken away with suitable tools, or dependence may be placed on the same breaking away during continued use of the point, either by resistance of the earth and stones and rocks therein, or by snagging on a large stone and snapping off. In any case, the new apex 9 now has a sharpened form comparable to the form of the initial apex.

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As use of the ripper point continues, the new apex wears further. Also, the corner 25 of the body 7 just rearward of where the connection 14 for the breakaway portion was located, will wear away. Such a line of wear 26 in FIG. 3 shows how the efficient earth-ripping form of the apex is retained and how the face 27 of the opening contributes thereto.

If the point is presented to the ground at a steeper angle than the one shown, the wear on the face 16 will increase, as indicated by the line 16a, and the wear on the lower face 24 will produce a line of wear 26a to define between said wear lines 16a and 26a a new apex 9a that is substantially as acute as the original apex 9. It will be evident from FIG. 3 that such wear will wear away the connection 13, leaving the reduced breakaway portion 10, as before described.

Whenever earth becomes compacted on a surface of the tooth, wear on said surface is lessened. Thus, by providing an earth-collecting cavity 29 in the upper face 19, wear on said face is reduced. It will be clear, therefore, that the openings 11 will become similarly earth-filled, the compacted earth serving to minimize deflection or breakage of portion 10.

The cavities or recesses 28 and 30 do not collect earth because they are on the under face of the point. The former serves to sharpen the apex and the latter provides a recessed area for commercial markings. Since the parallel ribs 31 wear in use, the space therebetween does not become earth-compacted.

While the foregoing has illustrated and described what is now contemplated to be the best mode of carrying out the invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, it is not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. A ripper point having
 - (a) a triangular apex an earth-cutting edge defined between a lower and an upper surface,
 - (b) an at least deep transverse opening spaced from and intermediate said surfaces being provided in said

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apex rearward of the edge thereof and nearer the said lower than the said upper surface, and

(c) the opening defining the upper surface of a wear-away portion in said bottom surface that has an integral end connection to the apex.

2. A ripper point according to claim 1 in which the opening has a flat form and is generally parallel to said lower face of the apex.

3. In a ripper point having a rearward mounting portion,

(a) an earth-cutting apex having a transverse opening therethrough forward of said mounting portion,

(b) said apex being defined between upper and lower wear surfaces,

(c) the opening being nearer to the lower surface to define a wearaway portion between the opening and the lower surface.

4. In a ripper point according to claim 3, the wear-away portion being divided transversely by a longitudinal slot therethrough.

5. A ripper point having

(a) a triangular apex having an earth-cutting edge defined between a lower and an upper surface,

(b) a transverse opening being provided in said apex rearward of the edge thereof,

(c) the opening defining the upper surface of a wear-away portion in said bottom surface that has an integral end connection to the apex, and

(d) the wearaway portion being divided by a middle, longitudinal slot into which the opening opens.

6. A ripper point according to claim 5 in which said opening has a flat form and is generally parallel to the lower face to the apex.

7. In a ripper point according to claim 3, the transverse opening extending horizontally through the apex from side to side thereof.

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