No. 887,984. PATENTED MAY 19, 1908.

F. J. THOMAS.

TOOTH FOR EXCAVATING SHOVELS.

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Fig. 1.

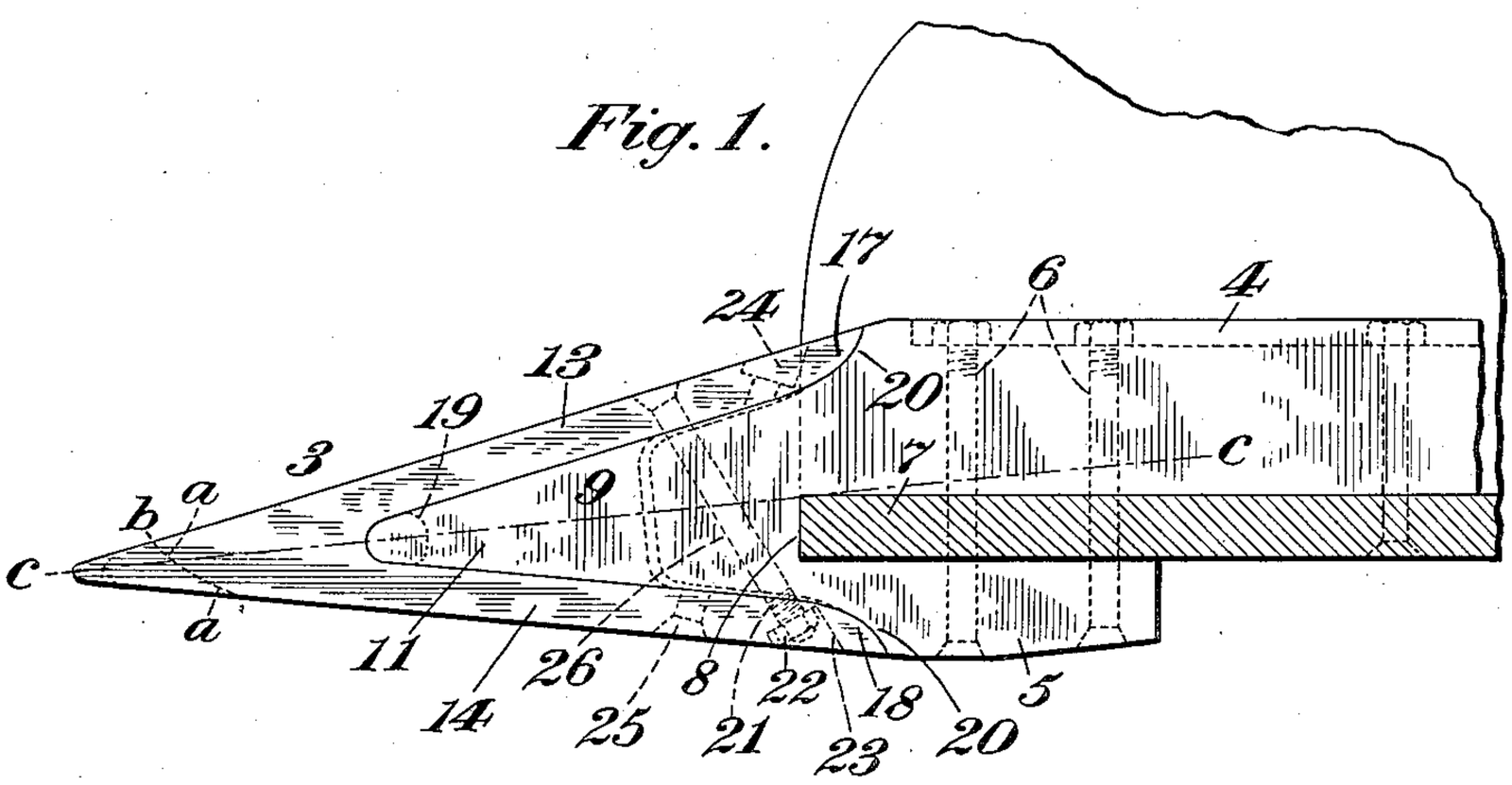


Fig. 2.

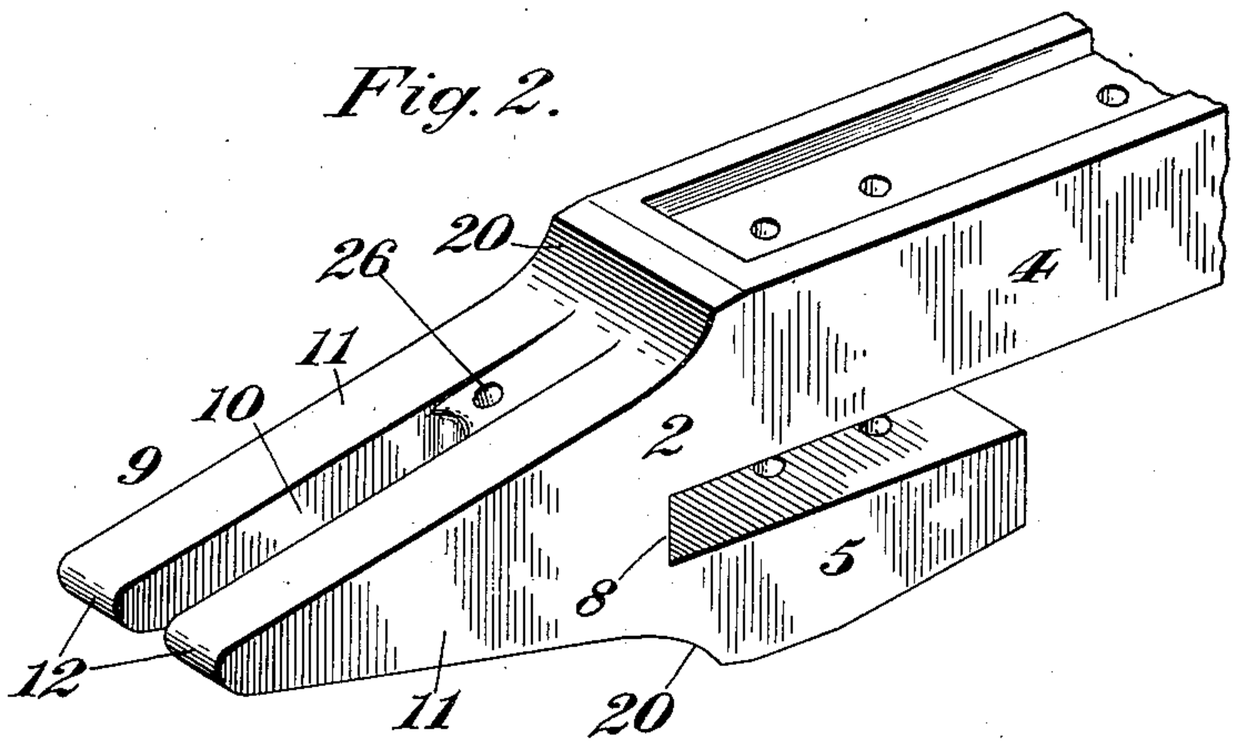
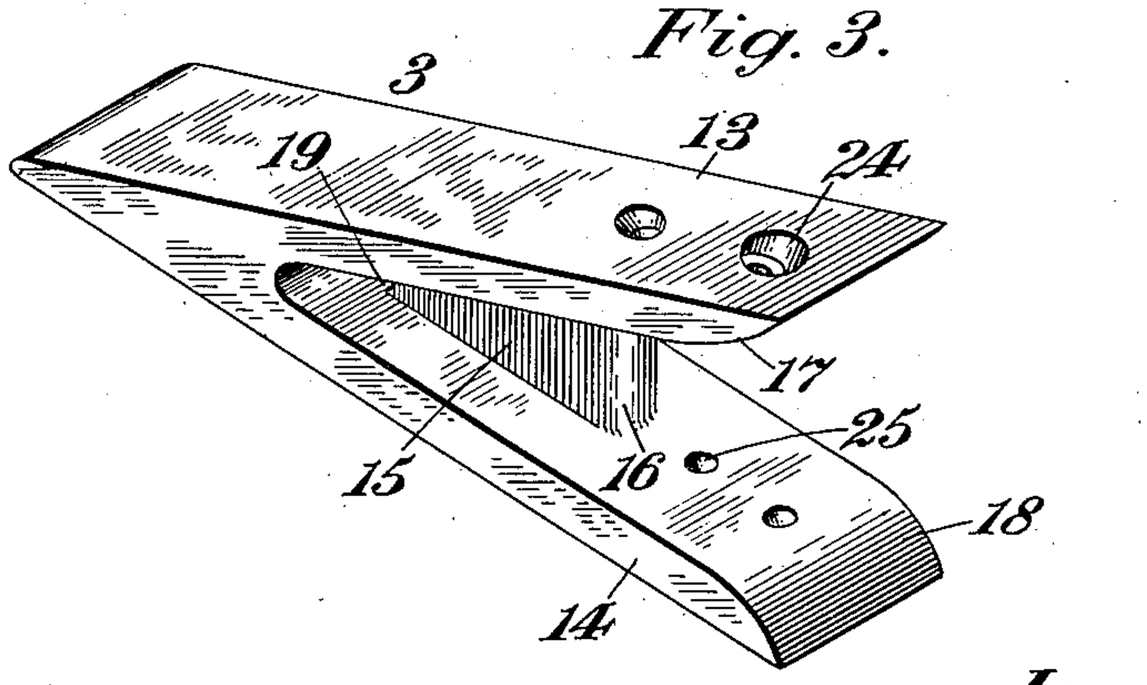


Fig. 3.



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UNITED STATES PATENT OFFICE.

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TOOTH FOR EXCAVATING-SHOVELS.

No. 887,984. Specification of Letters Patent. Patented May 19, 1908.

Application filed April 5, 1907. Serial No. 366,520.

To all whom it may concern:

Be it known that I, FRANK J. THOMAS, a citizen of the United States, residing in Greencastle, in the county of Putnam and State of Indiana, have invented certain new and useful Improvements in Teeth for Excavating-Shovels, of which the following is a specification.

This invention relates to teeth for excavating buckets or shovels, the object of the invention being to provide an improved two-part tooth in which the detachable point is reversible so that when it has worn away and become blunt through use it may be reversed and do efficient work without the necessity of reforming the point or removing it and supplying a new one to the tooth.

A further object of the invention is the provision of a detachable and reversible point.

The present invention is an improvement on that shown and described in my Reissue Letters Patent No. 12,608, dated February 12, 1907.

In the drawings accompanying and forming part of this specification, Figure 1 is a side view of this improved two-part tooth attached to an excavator shovel, which shovel is shown partly in section and broken away, as is also a part of the tooth; Fig. 2 is a perspective view of the tooth portion or base of this two-part tooth; and Fig. 3 is a perspective view of the point.

Similar characters of reference indicate corresponding parts throughout the different figures of the drawings.

This two-part tooth comprises a tooth or body portion or base 2 and a detachable and reversible point 3. The tooth is recessed to form a pair of shanks or jaws 4 and 5, one of which, as for instance the upper, is usually longer than the other and which jaws are bolted to the bucket by suitable bolts 6, the forward edge or lip 7 of the bucket fitting snugly in said recess, being engaged by the forward or end wall 8 of such recess, so that thrust on the tooth is imparted directly to the bucket lip, and not through the medium of bolts thereto. The body of the tooth is provided with a tapered nose 9, which is divided by a centrally located recess 10 into a pair of tapered parallel or spaced lugs 11 provided with rounded points 12.

The detachable and reversible wedge-shaped point 3 is bifurcated to form a pair of jaws 13 and 14 connected by a web or rib 15 rigidly uniting the two jaws to each other, thereby preventing any tendency of the jaws to spread and also preventing lateral movement or play of the point relative to the tooth portion or base. The end 16 of the web which is toward the rear of the point may conform, if desired, to the shape of the end wall of the recess between the lugs of the tooth, but in the present form of the two-part tooth this is unnecessary, since the nose portion is formed at the base thereof with a pair of shoulders 17 and 18, with the shape of which shoulders the inner ends 20 of the jaws of the point conform, the jaws terminating flush with the surfaces of the tooth. In the present instance these shoulders and the inner ends of the jaws of the point are curved, the shoulders being concave and the ends of the point convex, although this might be reversed if found desirable. By constructing the two-part tooth in this manner the point is interlocked with the tooth, being locked against transverse or lateral movement as well as vertical movement. The points are preferably made of steel castings, such for instance as manganese steel castings, a number being preferably supplied with each shovel, and if desired the web of each point may be provided with an opening 19 to form a passage therethrough so that any accumulation of dirt or rust which would interfere with the proper fitting of the point on its tooth may be removed.

In practice the work which these teeth have to do wears away the point, the major part of such wear being on the undersides of the points, so that their efficiency is gradually lessened until they become unfit for use owing to the bluntness of the points. With two-part teeth it has been the usual practice when the point has been worn into such a blunt condition that it is not efficient to do proper work, to remove the point and supply a new one. But by providing a reversible point the life thereof is very materially prolonged. In practice the point wears away in a somewhat similar manner to that illustrated by dotted line *a*—*a*, Fig. 1, and in this blunt condition it will not properly penetrate and do efficient work. But on reversing the point the sharp portion or penetrating end *b* of the point is brought into position to do its work properly. Thus, the point may be considered as practically self sharpening, since after it is reversed and again be-

comes worn away in the manner indicated by line *a*—*a* all that is necessary is to again reverse the point into its original position. Thus the life of the point is very materially prolonged, such point being capable of use without removal and reformation until practically worn down to the nose of the tooth. The point, however, in order to be reversible in a practicable manner, must have its cutting or penetrating part when reversed in substantially the same plane as this part was in prior to its reversal, and to accomplish this it must have both of its jaws terminating in about the same position with relation to the nose of the tooth and must also have each of its jaws engage the nose at about the same distance from the center line of such nose. This is accomplished by so locating the jaws with relation to a line, (see *c*—*c*) intersecting the apex at the point and the junction point of the jaws that each jaw will have its free end at about the same distance from that line when continued through the nose of the tooth, and the nose of the tooth must be correspondingly so formed that when the point is reversed this point will have the same position with relation to the bucket or shovel lip and will always be in the same cutting plane, with its thrust substantially in line with the lip or wall of the bucket to which the tooth is connected. In other words, the relation of the tapered nose of the tooth to the bucket lip must be such that the working end of the point will be substantially in line with such lip, and therefore in the line of the strain, whereby the liability of pulling off the point is prevented, and this is obtained by so locating the nose that the end thereof is substantially in the same plane as the bucket lip, while the working end of the point is not very materially above the plane of the underside of the tooth at the rear of its nose.

For the purpose of rigidly attaching the point to the nose, a bolt 21 is provided, shown passing through the point and the nose at an angle thereto, a nut 22 on one end located in a socket 23 of one of the jaws of the point clamping this bolt in position. The point is provided with another pair of alined bolt openings 24 and 25, which on the reversal of the point will communicate with the opening 26 passing through the nose for the reception of the bolt. In the present construction it will be noticed that the ends 20 of the jaws of the point extend to the rear of and passed the end wall 8 of the recess forming the tooth jaws and therefore beyond or in rear of the point of engagement of the nose with the bucket lip. In other words, the shoulders formed on the nose with which the free ends of the point jaws engage are in the rear of instead of in front of this recess wall 8, whereby the nose and point have a relatively long engagement with each other in consequence of which, while several bolts might be provided for securing the point to the nose nevertheless one bolt is sufficient to accomplish this purpose owing to this long engagement and also to the provision of the web connecting the jaws of the point and the location thereof in the bifurcated end of the nose, and whereby also the shoulders which are formed by cutting away the metal may be located at a point where there is considerable stock, and this without the necessity of forming an enlargement or bulging nose.

This improved point and its carrying member or body portion are so made, or cast as hereinbefore set forth, that the point can be assembled with either side up, the point thus being constructed as a reversible point, so that such point is reversible not only after it has become worn into that condition, but is reversible prior to any wear thereon. This avoids the necessity of its always being attached to the nose of the body in one particular manner to enable it to properly do its work. Since the point can be attached, because of its mode of construction, with either side up, as both outer sides are inclined and in the preferred construction have the same formation or inclination, it follows that the present improved point is reversible in the broadest sense of that term, since, as stated, before it has become worn at all it is reversible, so that it may be considered as a preformed or reversibly constructed point, that is, one constructed or formed reversible at the time of its manufacture and before it is attached to the nose, thus permitting it, as stated, to be attached with either side up.

I claim as my invention:

1. A tooth of the class described, comprising a tooth or body portion having a pair of jaws and provided with a forwardly extending nose comprising lugs spaced apart, and a detachable and reversible point having a web shorter than said jaws and projecting between said lugs.

2. A tooth having a forwardly projecting recessed nose, and a detachable and reversible point bifurcated to form a pair of jaws embracing said nose, said jaws being united by a web shorter than one of said jaws and projecting into within said recess.

3. A tooth having a body portion recessed to form a pair of parallelly located jaws adapted to embrace and extend rearwardly of the edge of a shovel, and a detachable and reversible point bifurcated to form a pair of jaws of substantially the same length adapted to embrace the nose of the tooth.

4. A detachable and reversible, wedge shaped point having at both sides to the apex thereof the same inclination.

5. A detachable and reversible, bifurcated, wedge-shaped point having at both sides to the apex thereof the same inclination.

6. A tooth comprising a recessed body having a forwardly extended nose recessed to

form a pair of tapered lugs spaced apart, and a detachable and reversible point comprising a pair of jaws embracing the nose and having a web uniting said jaws and located within the recess of said nose, the free ends of said jaws terminating in the rear of the front wall of the recess of said body.

7. The combination of a tooth comprising a recessed body having a nose divided by a recess into a pair of lugs, and a detachable and reversible point having jaws embracing said lugs and connected by a vertical web having an opening therethrough to facilitate the removal of foreign matter between the jaws.

8. A detachable and reversible tapered point bifurcated to form a pair of jaws and made or cast to have the same inclination at both sides of a line intersecting the apex and the juncture points of said jaws.

9. A two-part tooth of the class specified, comprising a tooth portion having means for attachment to a shovel or bucket and provided with a nose portion projecting forwardly therefrom, and a detachable and reversible point having two sets of alined bolt openings each set located to communicate with an opening extending through the nose.

10. A two-part tooth of the class specified, comprising a tooth portion having means for attachment to a shovel or bucket and provided with a nose portion projecting forwardly therefrom, and a detachable and reversible point having two sets of alined, angularly located bolt openings located in intersecting planes, each set located to communicate with a single bolt opening extending through the nose.

11. A two-part shovel tooth comprising a body portion having means for attachment to a shovel or bucket and provided with a forwardly extending nose, and a reversible point attachable to said nose, said nose and point so constructed that the working end of the point will be substantially in line with the lip of the bucket.

12. A two-part shovel tooth, comprising a body portion having means for attachment to a shovel or bucket lip and provided with a forwardly extended tapered nose, and a bifurcated point attachable to said nose, said nose and point being so located with relation to the bucket lip that a line passing through the apices of said point and nose will strike said lip.

13. A detachable and reversible wedge-shaped point bifurcated to form a pair of jaws united by a web and made or cast with substantially the same inclination at both sides of a line intersecting the apex and the juncture points of said jaws.

14. A two-part shovel tooth, comprising a body portion having means for attachment to a shovel or bucket and provided with a forwardly extended nose, and a bifurcated point attachable to said nose, said nose and point having substantially the same amount of metal located at each side of a line intersecting the apices of the nose and point whereby the point is reversible and said nose having a pair of alined shoulders against which the ends of the point jaws engage.

15. A shovel tooth having a recess for the reception of a shovel or bucket lip and provided with a forwardly extended nose made or cast with substantially the same amount of metal located at each side of a line intersecting the apex of the nose and the front wall of said recess, whereby it is adapted for the reception of a reversible point.

16. A two-part shovel tooth comprising a body portion having means for attachment to a shovel or bucket and provided with a forwardly extending nose, and a reversible tapered point made or cast with both sides inclined alike to the apex thereof.

17. A detachable and reversible wedge-shaped point bifurcated to form a pair of jaws of substantially the same length and having a web of less length than and uniting said jaws.

18. A detachable and reversible point bifurcated to form a pair of jaws of substantially the same length, and an integral web uniting said jaws, said web having an opening for the passage of a cleaning tool.

19. A shovel tooth having means for attachment to a shovel or bucket and provided with a forwardly extending tapered nose, and a tapered reversible point made or cast with the same amount of stock at each side of a line intersecting the apex of the nose and point.

20. In a tooth of the class specified, the combination with a carrying member, of a reversibly made or cast point attachable, when first applied to properly work with either side up.

21. In a tooth of the class specified, the combination with a carrying member, of a reversibly made or cast point comprising a pair of web-connected jaws and attachable, when first applied to properly work, with either side up.

22. A detachable and reversible point, comprising an approximately wedge shaped piece of metal bifurcated to form a pair of jaws united by a web, each of said jaws located at substantially the same distance from a line intersecting the apex and the juncture points of said jaws and having two sets of alined bolt openings located in intersecting planes.

23. A shovel tooth having a projecting recessed nose and a recessed body provided with a pair of shoulders located in substantially the same vertical plane and in the rear of the front wall of the recess of said body.

24. A shovel tooth, comprising a body portion having a recess, and a tapering nose

portion projecting forwardly from such body portion and terminating in a pair of vertically alined shoulders located in the rear of the front wall of the recess of said body.

25. A tooth of the class specified comprising a carrying member having means for attachment to a shovel or bucket, and a reversible point bifurcated to form a pair of web-connected jaws having both sides thereof inclined to its apex in the same angular plane.

26. A detachable and reversible point of the class specified having both sides thereof inclined to its apex in the same angular plane.

27. A shovel tooth having means for attachment to a shovel or bucket and provided with a forwardly extended nose having substantially the same amount of metal located at each side of a line intersecting the apex of the nose, whereby it is adapted for the reception of a reversible point, and bifurcated to form a pair of lugs spaced apart, said nose terminating in a pair of shoulders with which the inner ends of the jaws of the point engage.

28. A shovel tooth having a recessed portion for the reception of a shovel or bucket lip and provided with a forwardly extended nose having substantially the same amount of metal located at each side of a line intersecting the apex of the nose and terminating at said recess, whereby it is adapted for the reception of a reversible point and bifurcated to form a pair of lugs spaced apart, said nose terminating in a pair of shoulders located in the rear of the front wall of said recess.

29. A two-part tooth of the class specified comprising a tooth portion having means for attachment to a shovel or bucket and provided with a recessed nose portion, and a reversible point attachable thereto and having web-connected jaws engaging said tooth along their inner ends.

30. A two-part tooth of the class specified comprising a tooth portion having means for attachment to a shovel or bucket and provided with a recessed nose portion, and a reversible point attachable thereto and having web-connected jaws, the web projecting into said recess and engaging the inner or rear wall of said recess.

31. The combination of a tooth having a forwardly extended nose provided with a recess, and a detachable and reversible point bifurcated to embrace the nose and having a centrally located web fitting snugly within said recess and engaging the inner or rear wall thereof whereby the point and the nose are interlocked one with the other.

32. A tooth having a forwardly extended nose comprising a pair of tapered lugs spaced apart, said nose terminating at its rear in a pair of shoulders extending substantially the full width of said nose, and a detachable and reversible point having a pair of jaws embracing the nose and engaging said shoulders and connected by a web projecting into the space between the lugs of the nose.

33. A detachable and reversible point having a pair of jaws connected by a web shorter than said jaws.

34. A detachable and reversible point having a pair of jaws connected by a web shorter than one of said jaws.

35. A two-part tooth of the class specified, comprising a tooth portion having means for attachment to a shovel or bucket and provided with a nose portion projecting forwardly therefrom, and a point having two sets of alined bolt openings, each set located to communicate with a bolt opening extending through the nose.

36. A two-part tooth of the class specified, comprising a tooth portion having means for attachment to a shovel or bucket and provided with a nose portion projecting forwardly therefrom, and a reversible point having two sets of alined, angularly located bolt openings located in intersecting planes, each set located to communicate with a single bolt opening extending through the nose.

37. A shovel tooth having a projecting recessed nose, and a recessed body having a pair of shoulders located in the rear of the front wall of the recess of said body.

38. A detachable and reversible point having the top and bottom sides thereof inclined to the apex.

39. A detachable and reversible point comprising a pair of web-connected jaws having the top and bottom sides thereof inclined, each in a single angular plane.

40. A tooth comprising a carrying member and a detachable and reversible point comprising a pair of web-connected jaws having the top and bottom sides thereof inclined, each in a single angular plane.

41. A tooth comprising a carrying member having a forwardly extending, tapered and bifurcated nose, and a tapered and reversible point comprising a pair of web-connected jaws having the top and bottom sides thereof inclined to a horizontal plane and with the bottom side inclined upwardly toward the point.

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