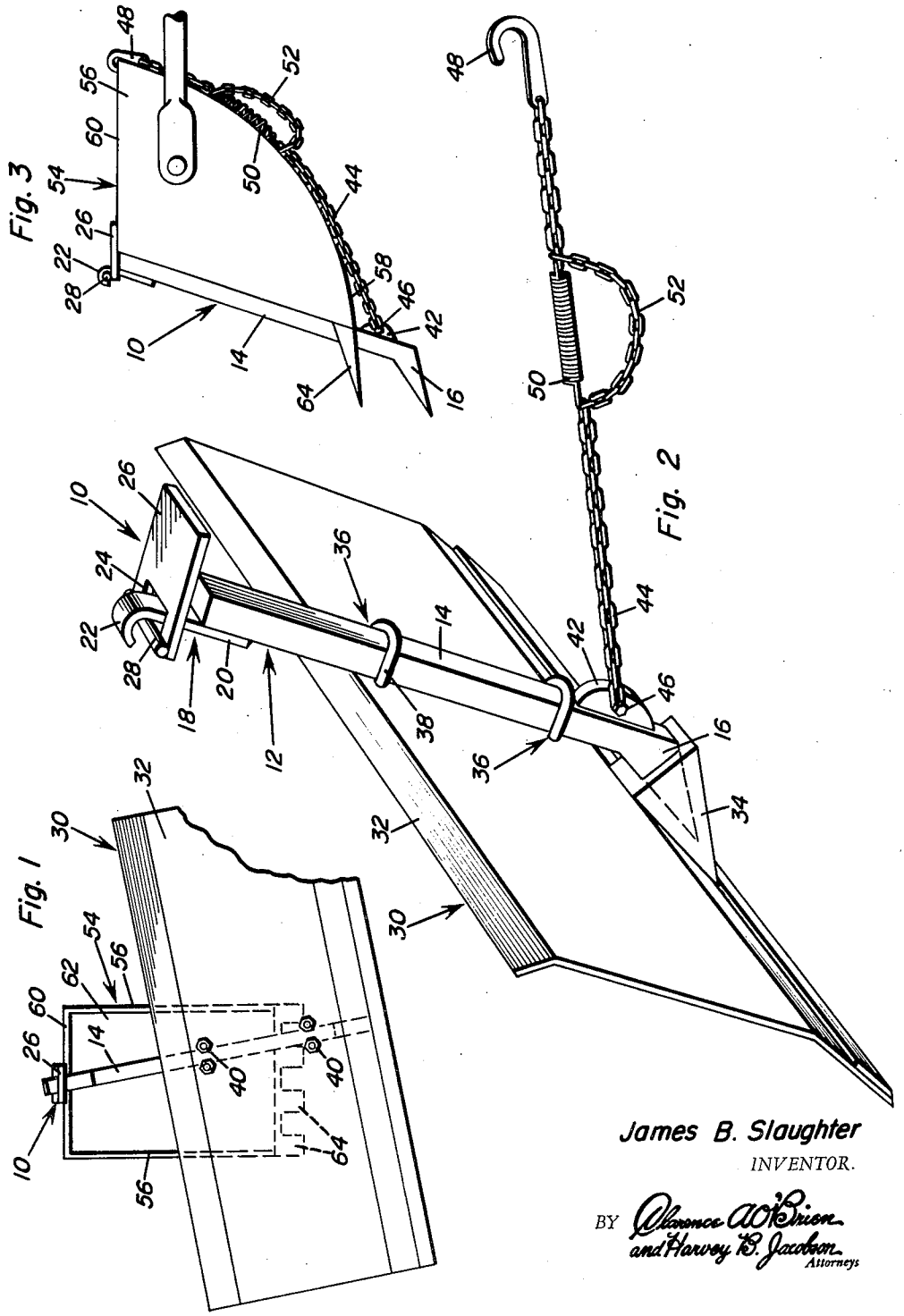
June 19, 1962 J. B. SLAUGHTER 3,039,210

ADJUSTABLE RIPPER TOOTH FOR POWER SHOVELS

Filed July 25, 1960 2 Sheets-Sheet 1



James B. Slaughter
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

June 19, 1962 J. B. SLAUGHTER 3,039,210

ADJUSTABLE RIPPER TOOTH FOR POWER SHOVELS

Filed July 25, 1960 2 Sheets-Sheet 2

Fig. 4

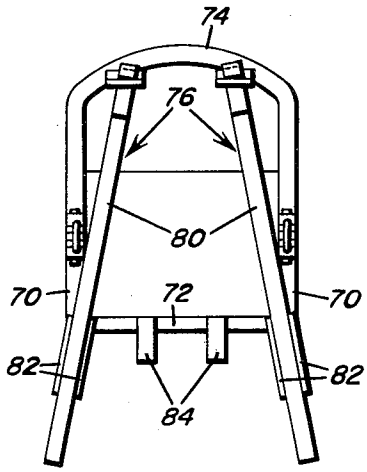


Fig. 5

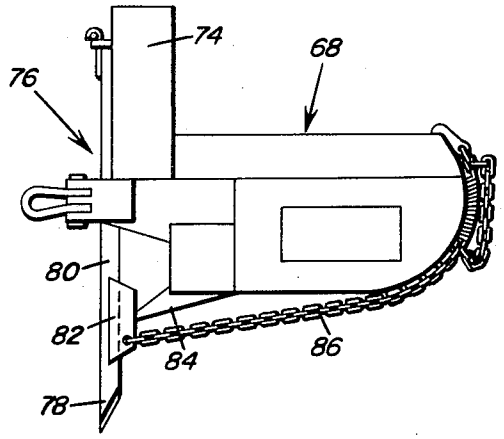


Fig. 6

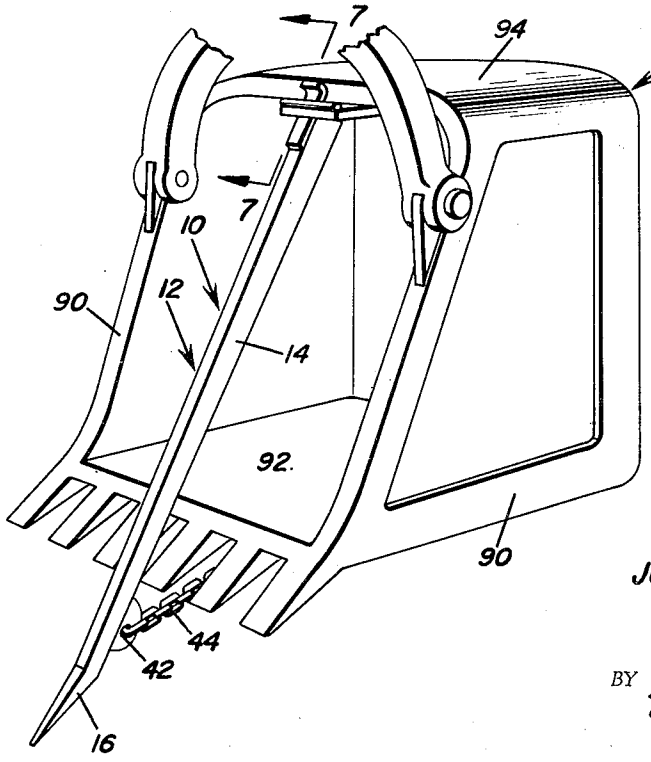
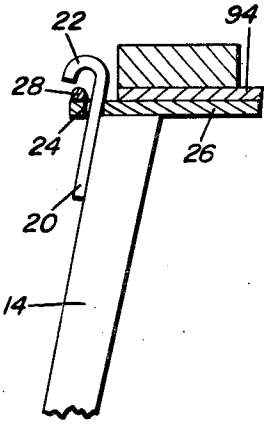


Fig. 7



James B. Slaughter

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

United States Patent Office 3,039,210 Patented June 19, 1962

3,039,210

ADJUSTABLE RIPPER TOOTH FOR POWER SHOVELS

James B. Slaughter, Central City, Ky.
(422 Reservoir Ave., Muhlenberg, Ky.)

Filed July 25, 1960, Ser. No. 45,079
9 Claims. (Cl. 37—117.5)

This invention relates to a novel and useful adjustable ripper tooth for power shovels, and more particularly to a ripper tooth adapted to be secured to the bucket of a power shovel in a manner whereby one end of the ripper tooth will project downwardly below the digging teeth of the bucket.

The ripper tooth of the instant invention may be removably secured to any conventional type of power shovel bucket and it is specifically adapted to assist in digging with a power shovel in hard shale or rock. The ripper tooth projects below the digging teeth normally provided on the lower lip of the power shovel bucket and may be utilized to rip through hard shale and rock when digging a trench or the like.

Although most power shovels have considerable power with which to dig, the relatively broad area covered by the digging teeth on the lower lip of the bucket of the power shovel can offer considerable resistance when digging through shale and/or rock and the ripper tooth is specifically adapted to be used when digging through shale or rock areas of the soil being dug to loosen the same so that the bucket of the power shovel may then be used to dig through the shale and/or rock.

The main object of this invention is to provide a ripper tooth specifically adapted for securement to the bucket of a power shovel in a manner which will dispose the ripper tooth below the conventional digging teeth of the shovel so that portions of a trench or the like being dug may be first ripped by means of the ripper tooth to loosen shale and/or rock through which the bucket of the power shovel alone cannot penetrate.

A further object of this invention, in accordance with the immediately preceding object, is to provide a ripper tooth and a means for mounting the same enabling the ripper tooth to be readily changed in position across the lower lip of the bucket of a power shovel whereby different portions of a narrow trench being dug by the bucket may be ripped without widening the trench.

A still further object of this invention is to provide a ripper tooth for power shovel buckets which will enable the operator of a power shovel to penetrate hard shale and rock not normally possible with the broad lower lip of the shovel thereby eliminating the necessity for blasting through portions of hard shale and rock.

A further object of this invention is to provide a ripper tooth which will enable a power shovel to penetrate hard shale and rock immediately adjacent a foundation wall of a building where normally hard shale and rock would have to be first loosened by means of jack hammers or the like inasmuch as blasting with explosives immediately adjacent a foundation wall could cause damage to the wall.

A final object to be specifically enumerated herein is to provide a ripper tooth for the bucket of a power shovel which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively simple in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front end elevational view of a type of power shovel bucket shown with the ripper tooth of the instant invention secured thereto and with a scraper blade carried by the ripper tooth;

FIGURE 2 is an enlarged perspective view of the ripper tooth shown with the scraper blade secured thereto and showing the manner in which the ripper tooth is resiliently retained in adjusted positions on a power shovel bucket;

FIGURE 3 is a side elevational view of a conventional form of back hoe bucket shown with the ripper tooth of the instant invention secured thereto;

FIGURE 4 is a front elevational view of a drag bucket shown with a pair of the ripper teeth secured thereto;

FIGURE 5 is a side elevational view of the drag bucket illustrated in FIGURE 4;

FIGURE 6 is a perspective view of a power shovel bucket shown with the ripper tooth of the instant invention secured thereto; and

FIGURE 7 is a fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 7—7 of FIGURE 6 showing the manner in which the ripper tooth shank is swivelly connected to the mounting bracket of the ripper tooth.

Referring now more specifically to the drawings the numeral 10 generally refers to the ripper tooth attachment of the instant invention. The ripper tooth 10 includes a ripper tooth member generally referred to by the reference numeral 12 having an elongated shank portion 14 terminating at its lower end in a ripper tooth portion 16. It will be noted that the ripper tooth portion 16 is angled forwardly of the shank 14. The upper end of the shank portion 14 has a mounting finger generally referred to by the reference numeral 18 secured thereto. The finger 18 includes a relatively flat plate-like shank 20 terminating at one end in a hooked portion 22. The hooked portion 22 and adjacent portion of the shank 20 is loosely received through a slot 24 formed in a mounting plate 26. The slot 24 extends transversely of the mounting plate 26 and is formed adjacent one end of the mounting plate 26. A reinforcing rod 28 is affixedly secured in any convenient manner such as by welding to the plate 26 and extends along one longitudinal edge of the slot 24. The hooked portion 22 of the finger 18 is received through the slot 24 and is engaged with the reinforcing bar 28. The shank 20 of the finger 18 is smaller in width than the length of the slot 24 whereby the shank 20 may be canted in the slot as well as rotated about the longitudinal axis of the reinforcing bar 28 by means of the hook portion 22.

It is to be understood that the mounting plate 26 is to be secured to a power shovel bucket in any convenient manner and that the shank 14 of the ripper tooth attachment 10 may be removed from engagement with the mounting plate 26 by pivoting the lower end of the shank 14 forwardly to disengage the hooked portion 22 from the slot 24.

With attention now directed more particularly to FIGURES 1 and 2 of the drawings it will be noted that a scraper blade assembly generally referred to by the reference numeral 30 is provided having a blade member 32 with a socket member 34 secured to the rear face thereof for receiving the ripper tooth portion 16. The socket member 34 is fixedly secured to the center lower portion of the blade member 32 in any convenient manner such as by welding and is provided with a socket conforming to the size and shape of the ripper tooth portion 16. The blade member 32 is also provided with a pair of adjustable clamp members generally referred to by the reference numeral 36 which each include a generally U-shaped

fastener whose free ends are secured through suitable apertures (not shown) in the blade member 32 by means of fasteners 40. The bight portion of the U-shaped members 38 embrace the shank 14 at spaced points longitudinally therealong to fixedly and removably secure the member 12 to the blade member 32.

The lower end of the rear edge of the shank 14 has a mounting lug 42 projecting rearwardly therefrom to which one end of a tension member 44 is secured by means of fastener 46. The tension member 44 includes a link chain whose end remote from the mounting lug 42 is provided with a hook member 48 for engagement with a portion of a power shovel bucket. An expansion spring 50 is interposed within the tension member 44 in a manner to provide a slack loop 52 in the tension member 44 for limiting the distance between the fastener 46 and the hook 48.

With attention now directed more particularly to FIGURES 1 and 3 of the drawings it will be seen that there is illustrated a form of back hoe bucket generally referred to by the reference numeral 54. The back hoe bucket is provided with opposite side walls 56 interconnected by means of a bottom wall 58 and an upper brace wall 60. The forward edges of the opposite side walls 56 and the bottom wall 58 define an opening 62 in the forward end of the bucket 54. The bottom wall 58 is provided with a plurality of digging teeth 64 which are spaced longitudinally along the forward edge of the bottom wall 58 and project forwardly and downwardly therefrom.

The mounting plate 26 of the ripper tooth attachment 10 is fixedly secured in any convenient manner such as by welding to the upper brace wall 60 of the bucket 54. The shank 14 of the attachment 10 extends across the opening 62 and is received between two adjacent digging teeth 64. The tension member passes underneath the bottom wall 58 and the hook 48 is engaged over the upper rear edge of the bottom wall 58 to resiliently urge the shank 14 into seated engagement with the forward edge of the bottom wall 58 between adjacent digging teeth 64.

In operation, the ripper tooth attachment 10 is secured to the bucket 54 and if it is desired to rip a given portion of a trench, the operator of the power shovel can drag the shovel rearwardly over the ground with the lower edge of the ripper tooth portion 16 engaging the ground so that the spring 50 is stretched and the shank 14 is positioned beyond the outermost ends of the digging teeth 64. While maintaining the shank 14 beyond the ends of the digging teeth 64 and the ripper tooth portion 16 in engagement with the ground, the operator of the power shovel may then move the bucket 54 to either the right or left to position the ripper tooth portion 16 as desired along the forward edge of the bottom wall 58 of the bucket 54. In this manner, the ripper tooth portion 16 of the ripper tooth attachment may be positioned as desired. During the normal digging operation, the ripper tooth attachment will remain in the position illustrated in FIGURE 3 of the drawings and may be utilized to rip various portions of the trench being dug. When it is desired to remove the member 12, the hook 48 is disengaged from the bucket 54 whereupon the lower end of the ripper tooth shank 14 may be pivoted forwardly to disengage the hooked portion 22 from engagement with the slot 24 and the rod 28. The mounting plate 26 of the attachment 10 can be therefore permanently secured to the bucket 54 in order to allow the ripper tooth member 12 to be readily secured to the bucket 54 whenever it is desired to rip a portion of the trench being dug.

When it is desired to use the scraper blade attachment 30, it may readily be secured to the shank 14 as previously set forth.

With attention now directed more particularly to FIGURES 4 and 5 of the drawings there will be seen a conventional form of drag bucket generally referred to by the reference numeral 68. The drag bucket 68 includes opposite side walls 70 interconnected by means of a bottom wall 72 and an upper brace wall 74.

A modified form of ripper tooth attachment generally referred to by the reference numeral 76 is used on a drag bucket and it will be noted that a pair of attachments 76 are secured to the drag bucket 68. The attachment 76 is substantially the same in construction as the attachment 10 with the exception that the ripper tooth portion 78 is aligned with the shank 80 and forms a continuation of the latter. The shanks 80 are each provided with a pair of rearwardly extending plates 82 which form a pocket in which to receive one of the digging teeth 84 of the drag bucket 68. The pocket is defined by the confronting surfaces of the plates 82 and the adjacent rear face of the shank 80. The plates 82 are provided to position the lower end of the shank 80 forwardly of the forward edge of the bottom wall 72 inasmuch as the upper brace wall 74 of the drag bucket 68 is positioned forwardly of the forward edge of the bottom wall 72. Thus, by positioning the shank 80 of the ripper tooth attachment 76 on the ends of the digging teeth 84 a better digging angle of the ripper tooth portion 78 is provided. The tension member 86 of the attachment 76 is substantially the same as the tension member 44 and is used in the same manner.

With attention now directed more particularly to FIGURES 6 and 7 of the drawings there will be seen a conventional form of shovel bucket generally referred to by the reference numeral 88 including opposite side walls 90 interconnected by means of a bottom wall 92 and an upper brace wall 94. The ripper tooth attachment secured to the shovel bucket 88 is identical to the ripper tooth attachment utilized in connection with the back hoe bucket 54 and has therefore been designated the same reference numerals with the attachment being generally designated by the reference numeral 10.

The mounting plate 26 of the attachment 10 used in connection with the shovel bucket 88 is secured to the undersurface of the upper brace wall 94 and the operation of the shovel bucket 88 to adjustably position the attachment 10 is substantially the same as the operation of the back hoe bucket 54 to adjust the attachment 10 secured thereto.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An adjustable ripper tooth for power shovel buckets of the type including a horizontally disposed receptacle having opposite side walls interconnected by means of a rear end wall and a bottom wall, an upper brace wall interconnecting the upper ends of said opposite side walls, and a plurality of forwardly projecting and downwardly inclined digging teeth spaced along the forward end of said bottom wall, the forward edges of said opposite side walls and said bottom wall defining an opening in the forward end of said receptacle, said adjustable ripper tooth comprising a ripper tooth member having an elongated shank portion terminating in a ripper tooth portion at its lower end and having means on its upper end adapted to swivelly mount said member to said upper brace wall with said shank extending across said opening and beyond the forward edges of said bottom wall, said shank being of a width to be adapted to be received between adjacent teeth of said digging teeth.

2. An adjustable ripper tooth for power shovel buckets of the type including a horizontally disposed receptacle having opposite side walls interconnected by means of a rear end wall and a bottom wall, an upper brace wall

interconnecting the upper ends of said opposite side walls, and a plurality of forwardly projecting and downwardly inclined digging teeth spaced along the forward end of said bottom wall, the forward edges of said opposite side walls and said bottom wall defining an opening in the forward end of said receptacle, said adjustable ripper tooth comprising a ripper tooth member having an elongated shank portion terminating in a ripper tooth portion at its lower end and having means on its upper end adapted to swivelly mount said member to said upper brace wall with said shank extending across said opening and beyond the forward edges of said bottom wall, said shank being of a width to be adapted to be received between adjacent teeth of said digging teeth, means carried by said shank and adapted for attachment to said bucket for resiliently urging the lower end of said shank into seated engagement with the forward edge of said bottom wall between adjacent teeth of said digging teeth.

3. An adjustable ripper tooth for power shovel buckets of the type including a horizontally disposed receptacle having opposite side walls interconnected by means of a rear end wall and a bottom wall, an upper brace wall interconnecting the upper ends of said opposite side walls, and a plurality of forwardly projecting and downwardly inclined digging teeth spaced along the forward end of said bottom wall, the forward edges of said opposite side walls and said bottom wall defining an opening in the forward end of said receptacle, said adjustable ripper tooth comprising a ripper tooth member having an elongated shank portion terminating in a ripper tooth portion at its lower end and having means on its upper end adapted to swivelly mount said member to said upper brace wall with said shank extending across said opening and beyond the forward edges of said bottom wall, said shank being of a width to be adapted to be received between adjacent teeth of said digging teeth, said means adapted to swivelly mount said member to said upper brace wall including a mounting bracket having a plate-like portion adapted for securement to said upper brace wall, a slot in said bracket, a finger including a flat shank terminating at one end on a hooked end portion secured to the upper end of said shank with said hooked portion loosely and removably engageable in said slot, said slot extending transversely of said shank.

4. The combination of claim 3 including a reinforcing bar secured to said plate along one longitudinal edge of said slot, said hooked portion rotatably receiving said rod.

5. The combination of claim 4 wherein said shank portion is less in width than the length of said slot wherein said shank may be canted in said slot to enable the lower end of said ripper tooth to be moved from one end of the forward edge of said bottom wall to the other.

6. An adjustable ripper tooth for power shovel buckets of the type including a horizontally disposed receptacle having opposite side walls interconnected by means of a rear end wall and a bottom wall, an upper brace wall interconnecting the upper ends of said opposite side walls, and a plurality of forwardly projecting and downwardly inclined digging teeth spaced along the forward end of said bottom wall, the forward edges of said opposite side walls and said bottom wall defining an opening in the forward end of said receptacle, said adjustable ripper tooth comprising a ripper tooth member having an elongated shank portion terminating in a ripper tooth portion at its lower end and having means on its upper end adapted to swivelly mount said member to said upper brace wall with said shank extending across said opening and beyond the forward edges of said bottom wall, said shank being of a width to be adapted to be received between adjacent teeth of said digging teeth, a scraper blade attachment, means removably securing said scraper blade to said shank.

7. The combination of claim 6 wherein said scraper blade includes an upwardly opening socket on the rear surface of said blade, said ripper tooth portion removably and seatingly receivable in said socket.

8. The combination of claim 7 wherein said securing means includes at least one adjustable clamp means carried by said plate and removably engageable with said shank.

9. An adjustable ripper tooth for power shovel buckets of the type including a horizontally disposed receptacle having opposite side walls interconnected by means of a rear end wall and a bottom wall, an upper brace wall interconnecting the upper ends of said opposite side walls, and a plurality of forwardly projecting and downwardly inclined digging teeth spaced along the forward end of said bottom wall, the forward edges of said opposite side walls and said bottom wall defining an opening in the forward end of said receptacle, said adjustable ripper tooth comprising a ripper tooth member having an elongated shank portion terminating in a ripper tooth portion at its lower end and having means on its upper end adapted to swivelly mount said member to said upper brace wall with said shank extending across said opening and beyond the forward edges of said bottom wall, said shank being of a width to be adapted to be received between adjacent teeth of said digging teeth, means carried by said shank and adapted for attachment to said bucket for resiliently urging the lower end of said shank into seated engagement with the forward edge of said bottom wall between adjacent teeth of said digging teeth, said resilient urging means comprising a flexible tension member, means securing one end of said tension member to said shank, and means on the other end of said tension member adapted for securement to a rear portion of said bucket, said tension member including an elastic section.

References Cited in the file of this patent

UNITED STATES PATENTS

514,645	Davy	Feb. 13, 1894
2,262,415	Williams et al.	Nov. 11, 1941
2,644,251	Smith	July 7, 1953
2,952,929	Lindberg	Sept. 20, 1960

FOREIGN PATENTS

576,624	Great Britain	Apr. 12, 1946