Oct. 31, 1967 E. F. SIMPSON ETAL 3,349,933

PAVEMENT LIFTER

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Fig. 1

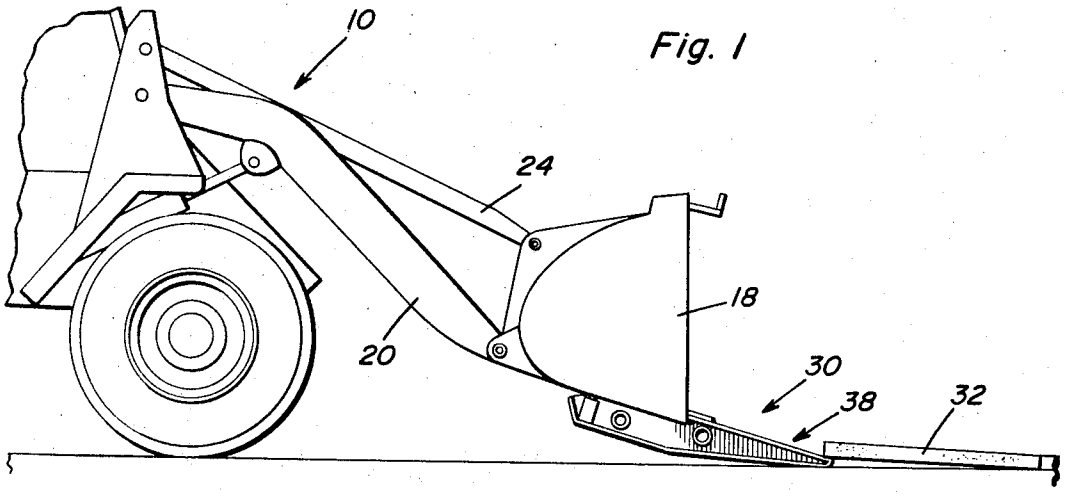


Fig. 2

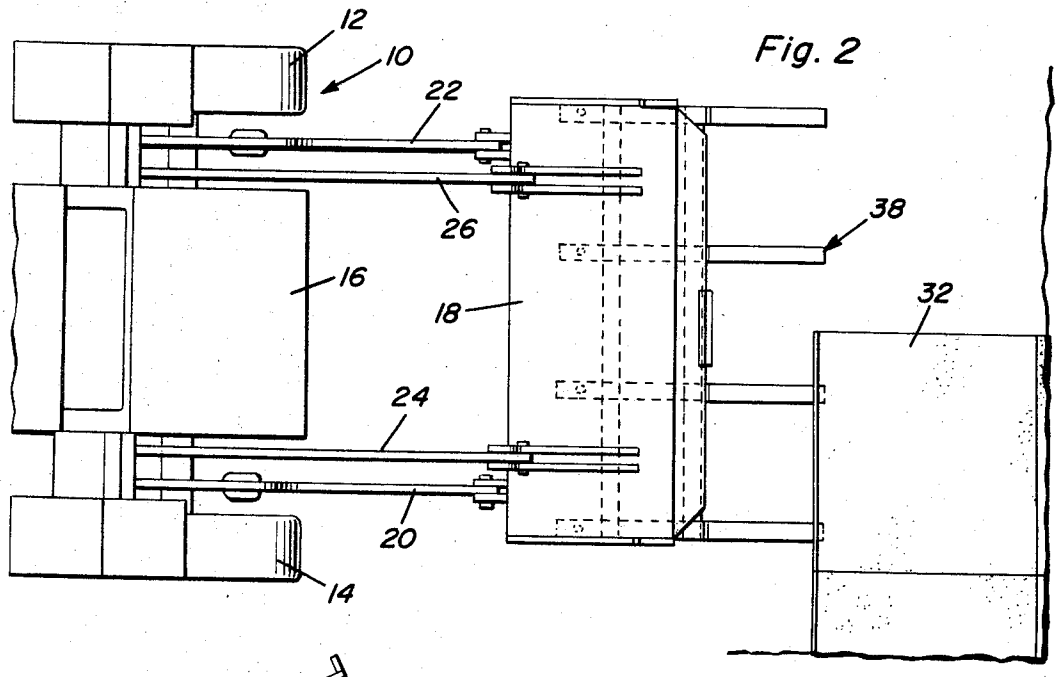
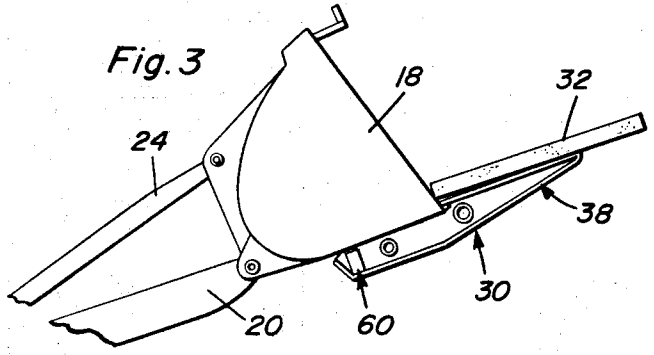


Fig. 3



Edward F. Simpson
Frank W. Simpson, Jr.
INVENTORS.

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

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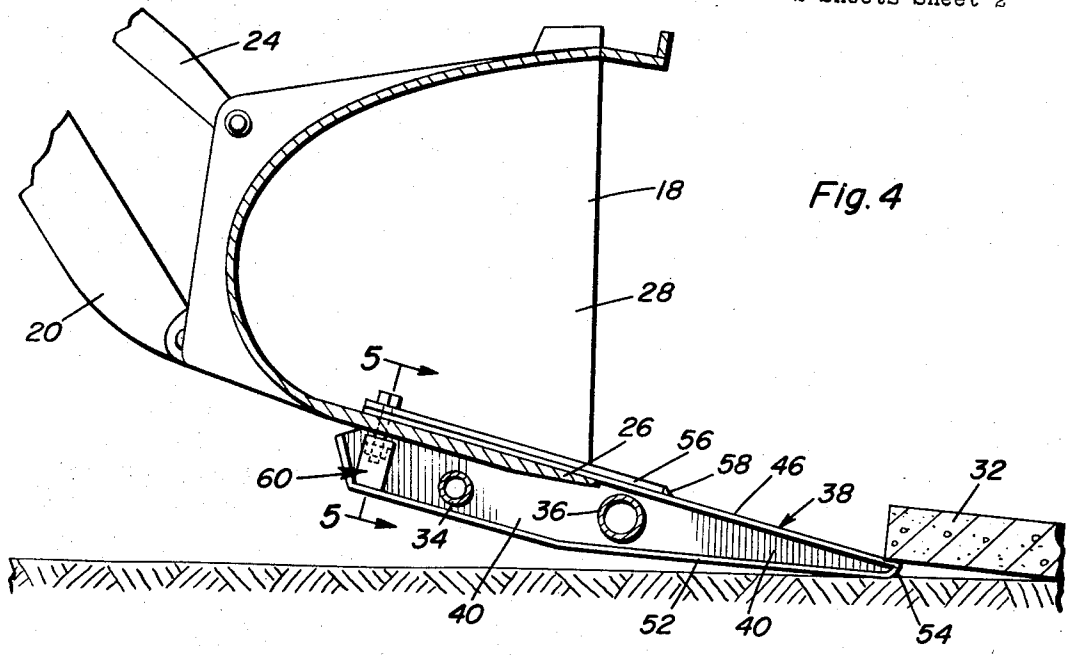


Fig. 4

Fig. 5

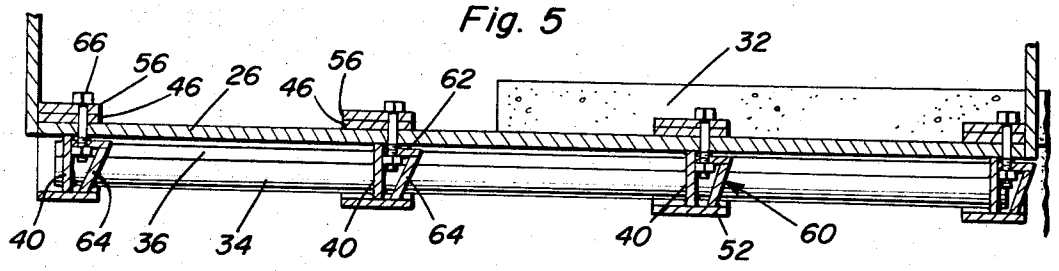
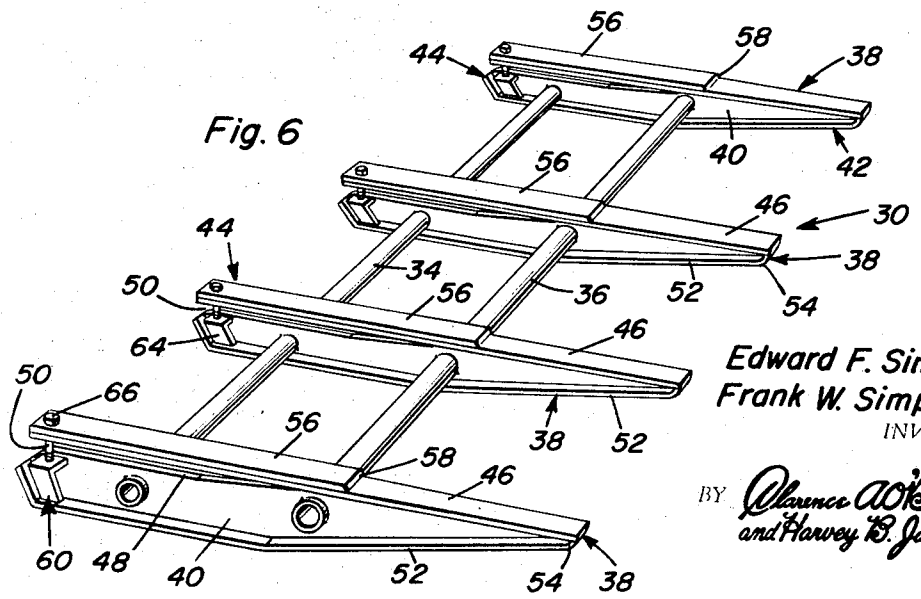


Fig. 6



Edward F. Simpson
Frank W. Simpson, Jr.
INVENTORS.

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

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3,349,933

PAVEMENT LIFTER

Edward F. Simpson, 524 Sandra Ave., Daytona Beach, Fla. 32014, and Frank W. Simpson, Jr., 2320 S. Peninsula Drive, Daytona Beach, Fla. 32018

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5 Claims. (Cl. 214—145)

ABSTRACT OF THE DISCLOSURE

A lifting attachment for a front end loader which includes a plurality of laterally spaced aligned lifting tines interconnected by bar members. Each of the tines includes an elongated slot extending inwardly from the rear end thereof for the reception of the lip of a loader bucket with the tines subsequently being bolted directly to the slot received bucket lip.

This invention relates generally to improved lifting devices, and more particularly to novel pavement lifting attachment units adapted for mounting on the power operated bucket of a front-end loader or the like.

It is an object of the present invention to provide novel lifting attachment units for front-end loaders or other excavation machines having power operated buckets thereon thereby enabling the machines to be used for pavement lifting as well as their usual excavation functions.

It is another object of the present invention to provide a pavement lifting unit of novel, compact and sturdy design which is readily mountable on existing buckets of various power excavation machines.

It is a further object of the present invention to provide a lifting unit of the character described including novel means for mounting the unit on a bucket or the like.

It is a still further object of the present invention to provide a lifting unit attachment adapted for attachment to a power operated bucket including a plurality of parallel spaced apart lifting arms or tines useful for lifting pavement sections without damage thereto.

It is another object of the present invention to provide a novel lifting attachment unit for front end loaders which may be quickly bolted to the digging lip of a bucket in order to lift pavement and/or side walk sections, the attachment or unit mountable on a bucket without necessity of modification of the bucket.

These together with other objects and advantages which will become subsequently apparent reside in the details if 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 partial side elevational view of a front-end loader with the pavement lifting attachment of the present invention mounted in place thereon;

FIGURE 2 is an enlarged plan view of the front-end loader and pavement lifting unit illustrated in FIGURE 1;

FIGURE 3 is a partial side elevational view similar to that of FIGURE 1 illustrating the power operated bucket and pavement lifting unit attachment in a second position;

FIGURE 4 is a partial enlarged view similar to that of FIGURE 1 with portions in vertical section;

FIGURE 5 is an enlarged vertical sectional view taken substantially on a plane of the line 5—5 of FIGURE 4; and

FIGURE 6 is a perspective view of the pavement lifting attachment unit comprising the present invention.

Referring now more particularly to the drawings, reference numeral **10** generally denotes a front-end loader of conventional configuration including the front wheels **12** and **14**, the body **16**, as well as the usual power operated

bucket **18** supported by lift arms **20** and **22** and tilt arms **24** and **26**. The bucket **18** is movable to a variety of positions by means of the lift and tilt arms, the buckets normally being able to be rolled and tilted in order to scoop and dump during an excavation operation. The bucket **18** includes a digging lip **26** which will normally be used for scooping earth or other material into the interior bucket chamber **28**. Thus, it will be appreciated by viewing FIGURES 1 through 4 in particular, that the front-end loader **10** with power operated bucket **18** thereon is a generally conventional power operated excavation machine.

The pavement lifting attachment unit is generally denoted by reference numeral **30** and is mounted on the digging lip **26** of the bucket **18** whereby it will be useful for lifting pavement sections such as that illustrated in FIGURES 1 through 5 and denoted by reference numeral **32**. The unit **30** mounted on the bucket will still enable the bucket to be rolled and tilted by the aforementioned lift and tilt arms, thereby enabling the unit **30** to lift a pavement section **32** while preventing any breakage or damage thereof.

The pavement lifting attachment unit **30** comprises a pair of parallel spaced apart mounting bars **34** and **36** on which are mounted a plurality of parallel spaced apart lifting tines, each generally denoted by reference numeral **38**, and each being substantially identical in construction. The lifting tines **38** each includes a body portion **40** which is a generally upstanding preferably metallic plate having mounting holes therein for mounting the lifting tines on the mounting bars **34** and **36**, as best illustrated in FIGURES 5 and 6 for example. Each lifting tine **38** includes a portion **42** which extends forwardly of the mounting bar **36** and will be useful for lifting, thereby being described as the lifting arm portion, as well as a rearwardly extending portion **44**, best known as the mounting portion. A horizontal lifting plate **46** is mounted at the top of the body portion or plate **40**, and is perpendicular thereto, the body portion being cut away as indicated by reference numeral **48** in order to provide a slot or recess **50** between the body portion **40** and the lifting plate **46** in the mounting portion **44** of the lifting tines **38**. A ground engaging plate or skid **52** is mounted in perpendicular relationship to the bottom edge of the body portion or plate **40**, the body portion or plate **40** converging forwardly at the lifting arm portion thereof whereby the ground engaging plate **52** will also converge forwardly and upwardly meeting the lifting plate **46** as indicated by reference numeral **54**. Thus, it will be appreciated that the forward end **54** of the lifting arm portion **42** will be more easily shoved or pushed under a pavement section **32**, as illustrated best in FIGURE 4 for example, in order to lift the pavement section, at which time further movement of the lifting tines **38** under the pavement section **32** will cause further lifting of the pavement section due to the rearwardly diverging nature of the lifting arm portion **42**.

Each lifting tine **38** has a reinforcing plate **56** mounted on the lifting plate **46** and coextensive therewith through a portion thereof, the reinforcing plate extending throughout the mounting section or portion **44** of the tines **38**. A slope face **58** is provided at the forward end of the reinforcing plate **56**, sloping downwardly to the lifting plate **46**, whereby as the tines **38** are pushed under the pavement section **32**, the pavement section will readily slide up onto the reinforcing plate **56**.

Referring now to FIGURES 4–6 in particular, it will be observed that each lifting tine **38** includes a bolt receiving bracket **60** thereon, each bracket including a horizontally extending leg **62** and a substantially vertical leg **64** thereon, the leg **62** attached to the body portion or plate **40**, and the leg **64** attached to the ground engaging

plate **52** as for example by each being welded thereto. The legs **62**, as well as the plates **46** and **56** include coaxial bolt receiving holes therein whereby a bolt such as bolt **66** may be positioned therethrough in order to mount the unit **30** on the digging lip **26** of the bucket **18**. Thus, it will be appreciated that the pavement lifting attachment unit **30** will be mounted on the bucket **18** in the following manner: The unit **30** is first placed on the ground, the slots **50** thus being approximately four inches above the ground inasmuch as they are approximately four inches above the bottom of the ground engaging plates **52**. At this time, the bucket **18** is moved to a pistion behind the unit **30** and then moved forwardly with the lip **26** moving into the slots or recesses **50** as illustrated in FIGURES 4 and 5 for example. It will be appreciated of course, that the digging lip **26** also has bolt receiving holes therein, spaced apart the same distance as the tines **38** are spaced on the mounting bars **34** and **36**, and thus, when the digging lip **26** is moved into the slots **50**, the bolts **66** may then be mounted through the mounting holes and fastened therein by means of conventional nuts as illustrated in FIGURE 5 for example. At this time, the unit **60** will be rigidly mounted on the bucket digging lip **26** and upon raising of the bucket, the unit will be moved therewith. Further, as will be apparent from the above description, the bucket **18** does not need any major modification thereto in order to mount the unit **30** thereon, the only modification being required is that of drilling four bolt receiving holes therein to receive the bolts **66**. Further, it will be appreciated that the unit **30** does not interfere with the normal movement of the bucket **18** as it is moved by the arms **20** and **24**, and thus the bucket can still be lifted to scoop and dump positions. This movement is illustrated and may be appreciated by referring to FIGURES 1, 2 and 4 in conjunction with FIGURE 3.

It will be appreciated of course, that the unit **30** may include any preferred number of lifting tines **38** thereon, and thus the unit may either be provided with additional or less lifting tines than the four tines illustrated in FIGURES 5 and 6. This will enable the unit to be used with lifting buckets of various widths, and inasmuch as it will be the usual case that the lifting tines will be equally spaced on the mounting bars **34** and **36**, regardless of the number of lifting tines, a unit **30** of lesser width than a bucket such as bucket **18** could be used with that particular bucket.

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. In combination with a front-end loader having a power operated bucket mounted thereon, a lifting unit detachably mounted on the bucket comprising, a plurality of lifting tines, means for interconnecting said lifting tines, means for mounting said tines on the digging lip of said bucket whereby said tines will be movable with said bucket as it is moved to various operative positions, said mounting means comprising slot means in each said lifting tine, said bucket lip movable into said slot means, and means for releasably connecting said lifting tines to said lip after it has been moved into said slot means, said first named connecting means comprising a pair of parallel spaced apart tine mounting bars, said lifting tines mounted on said bars and spaced equidistantly and in parallel relation therealong.

2. The combination of claim **1** wherein each said lifting tine has a flat-topped lifting arm portion at the front end thereof and a mounting portion at the rear end thereof, said slot means being in said mounting portion and extending longitudinally therealong.

3. The combination of claim **2** wherein said slot means is in the upper portion of said mounting portion with a major portion of the height of the mounting portion therebelow whereby said bucket lip may be easily moved into said slot means when said lifting unit is supported on the ground and ready to be mounted thereon.

4. A lifting unit attachment adapted for attachment to a power operated bucket comprising a plurality of lifting tines, means for interconnecting said lifting tines, means for mounting said tines on the digging lip of a bucket whereby said tines will be movable with the bucket, said mounting means comprising slot means in each of said lifting tines for the reception of a bucket lip therein, and means for releasably connecting said lifting tines to a bucket lip after it has been moved into the slot means, said first named connecting means comprising a pair of parallel spaced apart tine mounting bars, said lifting tines being mounted on said bars and spaced thereon in parallel relation to each other.

5. The attachment of claim **4** including a reinforcing plate mounted on each lifting tine in overlying relation to said slot means along a substantial portion of the length of said slot means.

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HUGO O. SCHULZ, *Primary Examiner.*