July 10, 1962 N. DISCENZA 3,043,032

BACK-FILLING BLADE FOR A POWER SHOVEL

Filed June 30, 1960 2 Sheets-Sheet 1

Fig. 1.

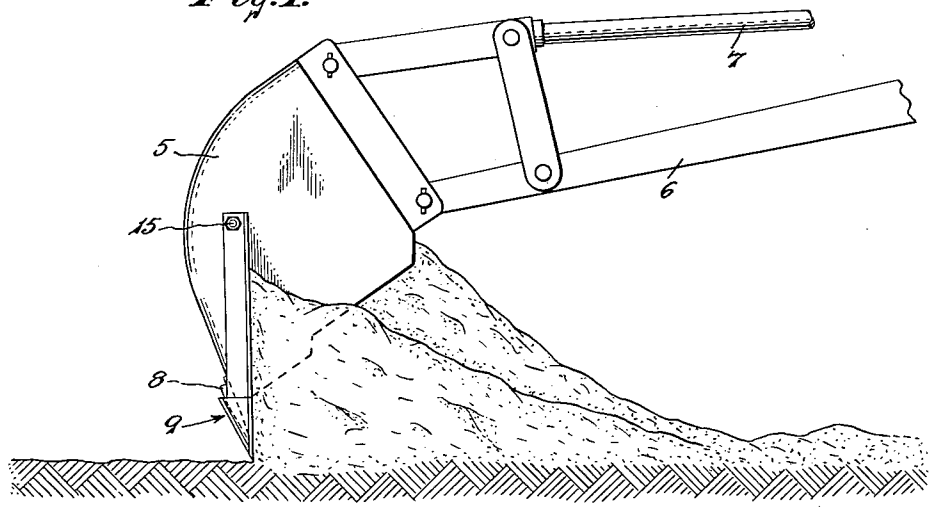

Fig. 2.

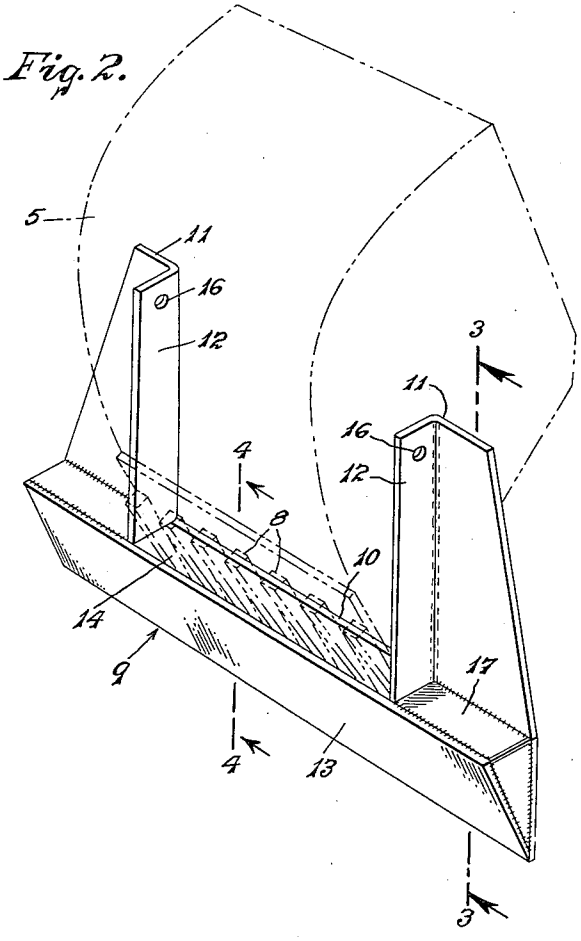

Fig. 3.

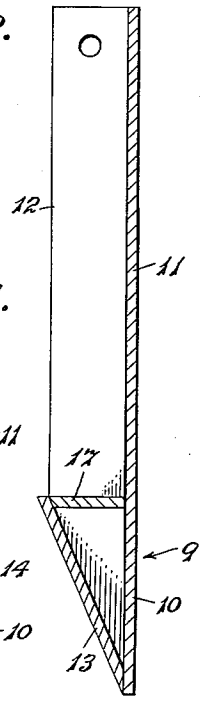

Fig. 4.

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Filed June 30, 1960 2 Sheets-Sheet 2

Fig. 5.

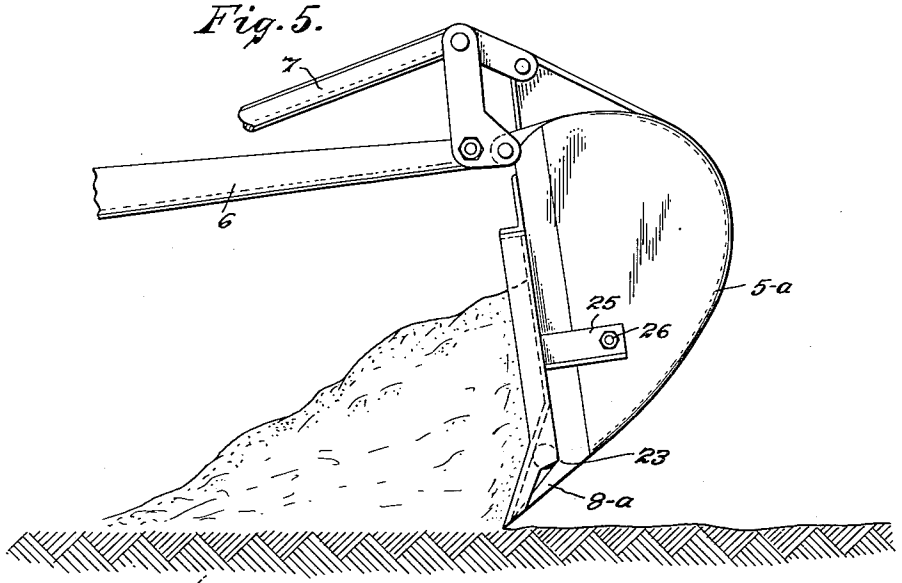


Fig. 6.

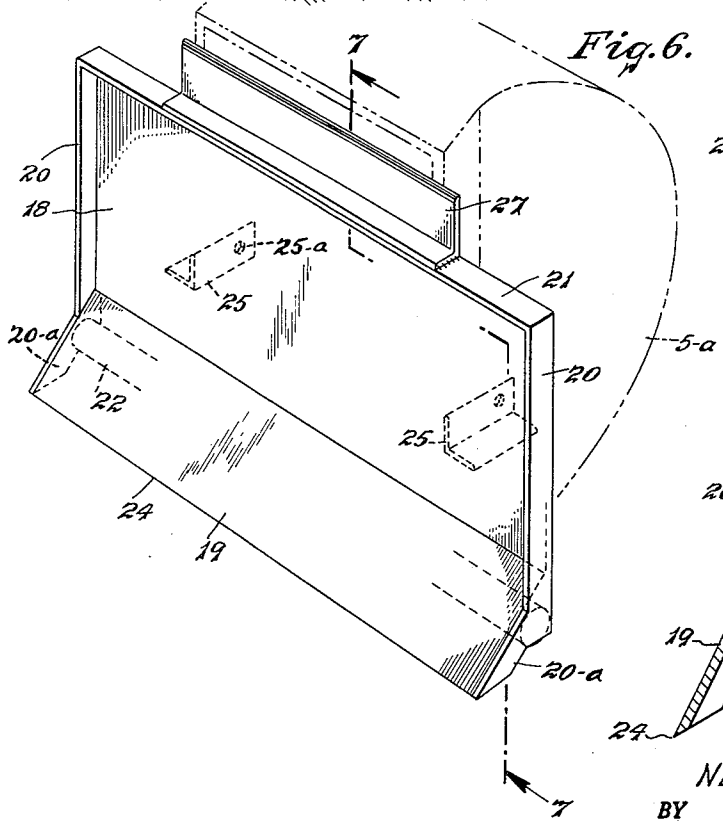
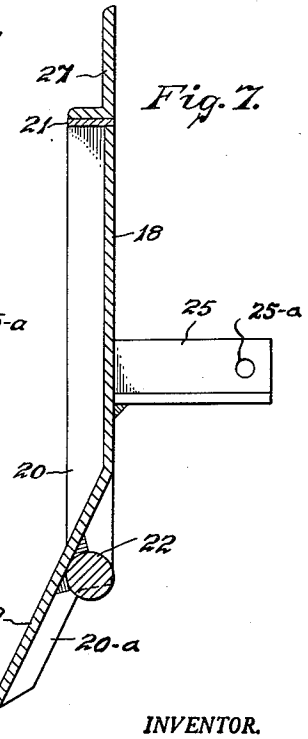


Fig. 7.



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BACK-FILLING BLADE FOR A POWER SHOVEL

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This invention relates to earth moving equipment and more particularly to back-filling blade attachments for the bucket of a power shovel for extending its range of effective operation to backfilling and grading work.

The art of earth moving has undergone revolutionary changes within recent years. Innovations and improvements in equipment and technique have taken place which heretofore were undreamed of. Huge, self-propelled vehicles are now available which are capable of transporting tons of earth easily, quickly and conveniently over terrain which would formerly have been impassable. Great giants of machinery can now level or move whole hills with relative ease. Earth moving equipment is available today which can accomplish in a single day what formerly required weeks or even months of arduous hand labor.

My invention, however, relates to a category of earth working apparatus and technique which has remained relatively unchanged while such great forward strides were being accomplished in development of heavy equipment and its use. Considered individually, the magnitude of small excavation projects such as trench digging or residential excavating does not compare with that of highway installation or industrial development. Collectively, however, many thousands of man hours of hand labor are required to dig and fill small excavations—labor which might otherwise be put to use in a far greater productive capacity. The installation of water or sewer pipes, for example, extending between a typical urban residence and a street main, necessitates digging a trench therebetween approximately four to eight feet in depth. Small, mobile power shovels designed for work of this general type efficiently dispose of the necessary excavation, depositing the dirt removed therefrom on the surface adjacent to the trench. Once the trench is dug, however, and the pipe laid, hours of laborious hand work must be spent by men with shovels back-filling the trench, and an even greater number of hours spent shoveling and raking in an effort to "clean up" and return the area of excavation to its former condition.

By using my improved back-filling blade attachment, however, the same power-shovel used to dig the trench may be speedily converted for use to efficiently, quickly and economically return the excavated dirt to the trench from whence it was removed. By simply attaching my back-filling blade to the bucket of the power shovel, the shovel may be used either to push or pull the mounds of dirt previously deposited along the edge of the trench into the excavation. Since my back-filling blade shields the digging teeth of the bucket, there is no danger of their gouging or scarring an established lawn as the edge of the blade is drawn along the surface thereof.

Earth moving equipment of the bulldozer type is frequently employed in an effort to minimize the hand work associated with back-filling. Effective use of such equipment, however, is restricted because of the relatively large amount of operating area required therefor, and is prohibited in areas having established lawns and landscaping unless there is no concern for probable damage thereto. At best, the conventional bulldozer can accomplish only "rough" grading leaving a substantial amount of "finish" work to be accomplished by hand labor. The use of a bulldozer also involves bringing another piece of heavy equipment to the job site which not only compounds scheduling problems but is also an additional expense.

The use of my improved back-filling blade attachment, however, permits a power shovel operator of ordinary skill to perform, in addition to the excavating operation, both the back-filling of the bulldozer and the "clean-up" finish grading heretofore of necessity done by hand labor using picks, shovels and rakes. A trench or the like may be rapidly and inexpensively back-filled, and rough and finish grading may be accomplished with the same equipment and with the economy and efficiency of modern mechanization—utilizing only one piece of equipment for excavating, back-filling and grading.

A primary object of the invention is to provide an attachment for power shovels and the like which will extend their field of effective operation and permit their use for back-filling and grading.

A further object of the invention is the provision of such an attachment having means cooperable with the teeth on the bucket for positioning the attachment thereon.

A still further object of the invention is to provide an attachment which will, in one form, utilize the capacity of the bucket to permit the movement of large quantities of earth or like materials.

Another object of my invention is to provide an attachment that can be conveniently and securely affixed to the bucket of a power shovel and which will greatly increase the utility thereof.

Still another object is to provide an improved attachment for a power shovel, the use of which will virtually eliminate the expense of costly hand labor in back-filling trenches and like excavations.

A still further object is to provide such an attachment which may be detachably secured to the bucket of a power shovel.

Another object is to provide such an attachment cooperable with the teeth on the bucket whereby said teeth may be sheathed to prevent scarring or gouging of established lawns.

Further objects and advantages of this invention will be more clearly understood from the following description and accompanying drawings in which:

FIG. 1 is an elevational side view showing the bucket of a conventional power shovel having a preferred form of my improved attachment mounted thereon.

FIG. 2 is an isometric view of said attachment.

FIG. 3 is a sectional side view taken on line 3—3 of FIG. 2.

FIG. 4 is a similar view taken on line 4—4 of FIG. 2.

FIG. 5 is an elevational side view showing a modified form of my attachment mounted upon the bucket of a conventional power shovel.

FIG. 6 is an isometric front view of said modified form of said attachment.

FIG. 7 is a sectional side view taken on line 7—7 of FIG. 6.

As shown in the drawings, the numeral 5 denotes the bucket of a conventional power shovel. Said bucket is pivotally mounted on a boom 6 and is operated by a control bar 7 in the well-known manner. The bucket is provided with a series of spaced teeth 8 which project from the lower edge thereof and are adapted to bite into the earth when said bucket is used for digging operations.

In its preferred form, illustrated in FIGS. 1 to 4, my improved attachment, indicated generally at 9, comprises a front plate 10 having a width greater than that of the bucket 5 and also having spaced side portions 11—11 extending upwardly from its opposite ends. Said side portions are provided with opposed, rearwardly extending flanges 12—12 on the inner edges thereof disposed perpendicularly thereto and are spaced to embrace the opposite sides of said bucket whereby they may be detachably secured thereagainst.

An elongated rear plate **13** is secured along its lower edge to the lower edge of said front plate **10** and is inclined rearwardly therefrom to provide a pocket **14** therebetween adapted to receive the teeth **8—8** for positioning and securing the attachment on the bucket as shown in FIGS. 1 and 2. The said pocket **14** formed thereby is of such size and shape as to receive the teeth **8—8** whereby the undersurface of said teeth rests in abutting contact with the inner surface of said rear plate while the points thereof rest against the rear surface of the front plate **10** in cooperate engagement therewith to prevent movement of said attachment when force is exerted against said front plate.

The pocket **14** not only aids in positioning and securing the attachment but also serves to shield or sheath the said teeth in order to prevent scarring or gouging thereby during operation of the power shovel. The said attachment is secured to the bucket by means of suitable bolts **15—15** which extend through holes **16—16** in the flanges **12—12** and through aligned holes in the sides of the bucket. If desired, the portions of the pocket outwardly of the bucket may be closed by suitable plates **17—17** which also serve to support the plate **13**.

When it is desired to convert the power shovel for use in back-filling, it is a simple matter to attach my improved back-filling blade thereto by seating the teeth of the bucket into the pocket **14** designed therefor. The flanges **12—12** may then be secured to their respective sides of the bucket by the said bolts **15—15**.

In the modified form illustrated in FIGS. 5 to 7, the said attachment comprises a plate **18** having a forwardly inclined lower portion **19**. The two side and upper edges of said plate **18** are provided with forwardly extending flanges **20—20** and **21** respectively to confine, insofar as possible, the fill or earth to said plate and thereby increase the capacity thereof. If desired, the flanges **20—20** may be extended along the edges of the portion **19**, as at **20*a***. The said flanges further tend to increase the strength and rigidity of the device.

The said lower portion **19** of the plate **18** is inclined forwardly and is provided on the rear side thereof with a supporting bar **22** rigidly secured thereto. Said bar extends longitudinally of the plate and is positioned so as to rest in the angle **23** formed by the front surface of the teeth **8*a*** and the side of the bucket **5*a*** as shown in FIG. 5 when the modified form of my invention is positioned on said bucket. The angle formed by the front plate and the lower portion thereof is such that the rear surface of the plate **18** rests in abutting engagement with each of the front edges of the sides of the bucket while the lower or marginal edge **24** of the lower portion **19** thereof rests upon the upper surface of said teeth and extends slightly forward thereof.

The said plate **18** is provided with rearwardly extending flanges **25—25** adapted to receive the bucket **5*a*** therebetween and to be secured to said bucket by means of suitable bolts **26** which extend through holes **25*a*—25*a*** in the flanges **25—25** and through aligned holes in the sides of said bucket.

A guard plate **27** may be provided to extend upwardly from the plate **18** and across the upper portion of the bucket **5*a*** whereby to prevent and spilling of earth into the bucket during the back-filling operation. The weight of earth is well known and if the bucket were to become filled, the productive efficiency of the power shovel would be greatly reduced since much of its usable horsepower would be wasted in merely carrying about the dead weight of a bucket filled with earth.

When mounting the modified form of my attachment to the bucket of a conventional power shovel it is simply positioned thereon with the bar **22** resting in the angle **23** and removably secured thereon by the bolts **26—26** as aforementioned.

I claim:

1. In combination with an excavating shovel of the type having opposed sides, an open front, and a plurality of laterally spaced digging teeth along the forward lower edge thereof, a back-filling attachment comprising a blade having a front plate, said plate being wider than said shovel whereby said plate extends outwardly of the opposed sides thereof, said plate having an opening therein of substantially the same width as said shovel, the side edges of said opening abutting said opposed sides whereby the said plate and said shovel together form a continuous dirt-engaging surface, means at the lower end of said plate engaging, overlying and shielding all of said teeth to prevent scarring of the ground when said shovel is converted to back-filling purposes, and means on said front plate securing said attachment to the said opposed sides of the bucket.

2. In combination with an excavating shovel of the type having opposed sides, an open front, and a plurality of laterally spaced digging teeth along the forward lower edge thereof, a back-filling attachment comprising a blade including a rear plate and a front plate extending outwardly of said opposed sides of said bucket, said rear plate being inclined rearwardly relative to said front plate and secured thereto along its lower edge to form a locating pocket therebetween receiving the said teeth for positioning the said attachment on the said bucket with its longitudinal axis substantially parallel to the ground and for sheathing the said teeth to prevent scarring when the said shovel is converted to back-filling purposes, said front plate having upwardly extending spaced side portions forming an opening in said front plate, said opening receiving the said bucket therein when the said teeth are positioned in the said locating pocket, the said side portions abutting the outer faces of the said opposed sides whereby the said open front of said bucket is unobstructed by the said blade, and means on said side portions securing said attachment to the said opposed sides of the bucket.

3. In combination with an excavating shovel of the type having opposed sides, an open front, and a plurality of laterally spaced digging teeth along the forward lower edge thereof, a back-filling attachment comprising a blade including a rear plate and a front plate extending outwardly of said opposed sides of said bucket, said rear plate being inclined rearwardly relative to said front plate and secured thereto along its lower edge to form a locating pocket therebetween receiving the said teeth for positioning the said attachment on the said bucket with its longitudinal axis substantially parallel to the ground and for sheathing the said teeth to prevent scarring when the said shovel is converted to back-filling purposes, transverse web portions connecting the portions of said rear plate and said front plate extending beyond said opposed sides, rearwardly extending flanges on said front plate in abutment with the opposed sides of said shovel, said flanges being attached at their lower ends to said transverse web portions and means detachably securing said flanges to said opposed sides whereby said blade is detachably secured to said bucket.

4. In combination with an excavating bucket of the type having opposed vertical sides, a bottom joining said sides, an open mouth at the front thereof and a plurality of laterally spaced digging teeth projecting forwardly from the lower edge of said mouth, a back-filling attachment comprising a blade including a plate that is wider in a horizontal direction than said bucket and extends laterally outwardly of said opposed sides thereof, said plate having an opening located substantially centrally thereof and receiving said bucket, said opening having spaced vertical side edges disposed in close proximity to the outer surface of the said vertical sides of said bucket and a horizontal lower edge adjacent to the lower portion of said mouth whereby said bucket may receive dirt through said mouth during use of said blade to augment the capacity thereof, said plate having a portion below the lower edge of said opening overlying and shielding said teeth

and means on said plate detachably securing said plate to said bucket.

5. In combination with an excavating bucket of the type having opposed sides, an open front and a plurality of laterally spaced digging teeth along the lower, forward edge thereof, a back-filling attachment comprising a blade including an elongated plate of generally rectangular form attached to said bucket in a substantially upright position and having side portions thereof extending outwardly of said opposed sides of said bucket, said blade having its longitudinal axis substantially parallel with the ground, means on the rear surface of said blade engageable with and receiving at least one of said plurality of laterally spaced digging teeth for positioning and securing the lower edge portion of said attachment on said bucket whereby the said teeth may be shielded to prevent scarring when the said shovel is used for back-filling purposes, said outwardly and upwardly extending side portions forming an opening in said blade of substantially the same width as said shovel whereby the said plate and said excavating bucket together form a continuous dirt engaging and dirt carrying surface, and connecting means on said side portions detachably securing said blade in position on said bucket.

6. The attachment defined in claim 5 wherein the said

attaching means includes a pair of rearwardly extending spaced flanges on the rear surface of said blade positioned inwardly of the inner edges of said outwardly and upwardly extending side portions, and abutment surfaces on said flanges for abutting engagement with the outside surface of said opposed sides to detachably secure the said side portions in abutment with said opposed sides of said bucket.

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