July 22, 1969 H. GILBERTSON 3,456,370

CORNER BIT ASSEMBLY FOR EARTHMOVING BLADES

Filed Sept. 21, 1967 2 Sheets-Sheet 1

Fig. 1

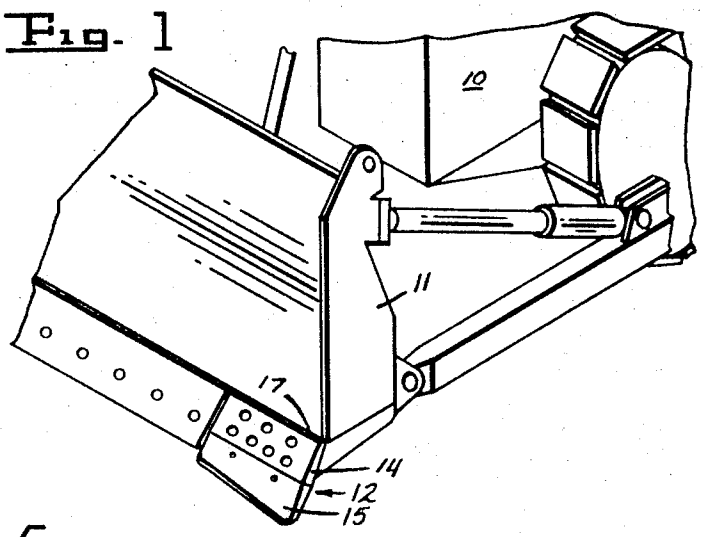
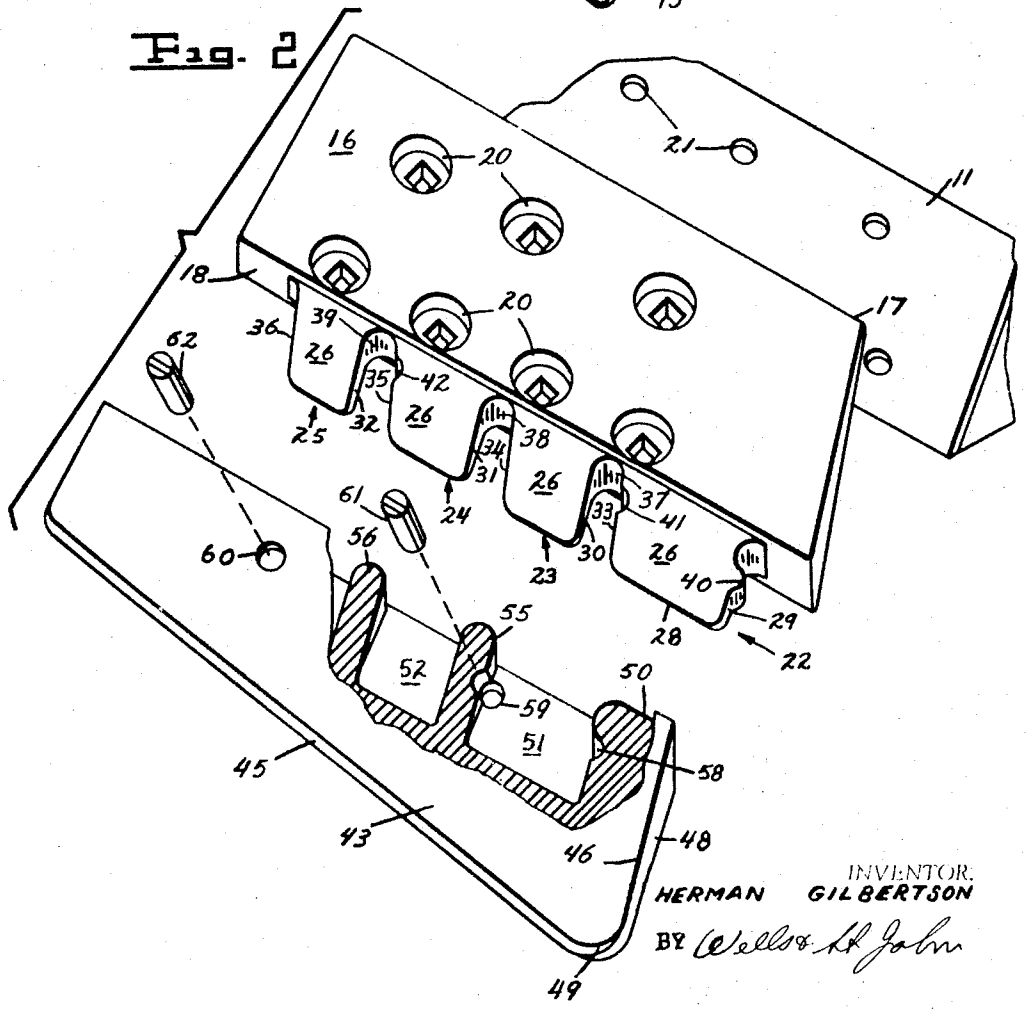


Fig. 2



INVENTOR.
HERMAN GILBERTSON
BY Wells & St John
ATTYS.

July 22, 1969 H. GILBERTSON 3,456,370

CORNER BIT ASSEMBLY FOR EARTHMOVING BLADES

Filed Sept. 21, 1967 2 Sheets-Sheet 2

Fig. 3

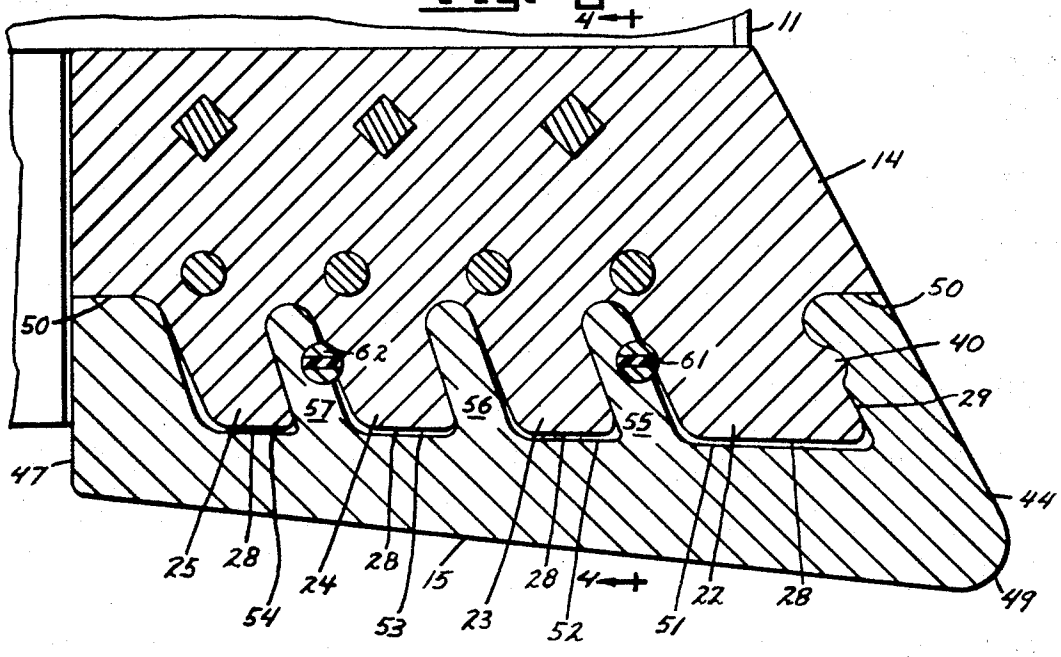
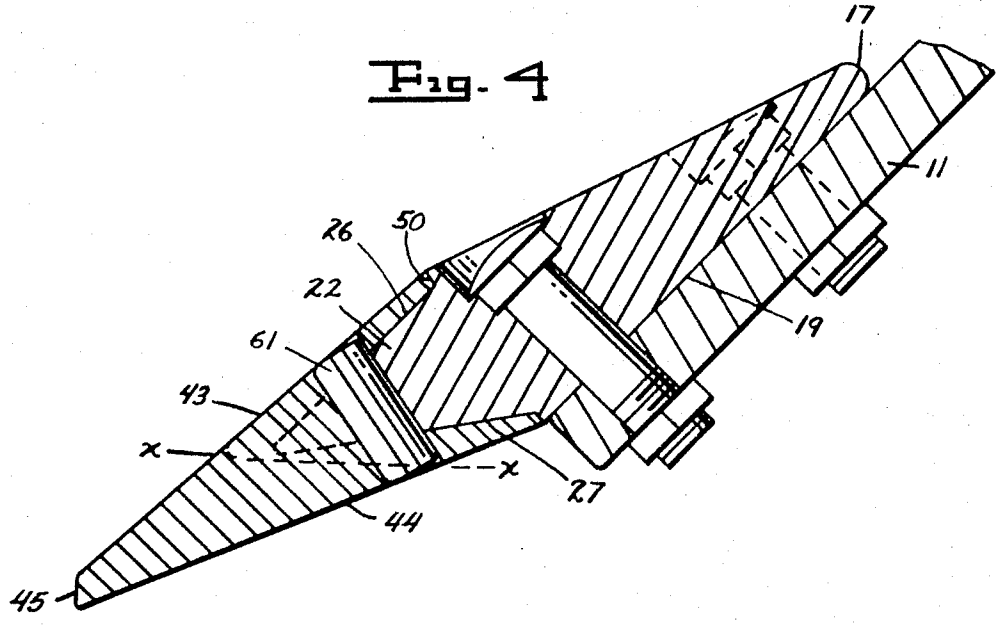


Fig. 4



INVENTOR.
HERMAN GILBERTSON

BY Wells & St John

ATTYS.

United States Patent Office 3,456,370 Patented July 22, 1969

3,456,370

CORNER BIT ASSEMBLY FOR EARTHMOVING BLADES

Herman Gilbertson 4920 N. Rebecca, Spokane, Wash. 99207

Filed Sept. 21, 1967, Ser. No. 669,586
Int. Cl. E02f 3/76, 3/12
U.S. Cl. 37—141 4 Claims

ABSTRACT OF THE DISCLOSURE

A corner bit assembly is described for attachment to earth moving blades to prevent wear and breakage of the blade. The assembly has an adapter that is rigidly secured to the blade by bolts and a readily replaceable bit. The adapter has a plurality of support fingers that extend downward, forward and outward for fitting into respective cavities formed in the back of the bit. A rib is formed on one of the end fingers for interlocking in an indentation formed in the respective cavity wall. Knockout pins passing between other fingers and the corresponding cavity wall in the bit complete the securement of the bit on the adapter.

BACKGROUND OF THE INVENTION

This invention relates to blade bits for earthmoving equipment and more particularly to corner bits for earthmoving blades that are utilized on bulldozers, graders and the like.

The corners of the earthmoving blades are subjected to accelerated wear and greater forces in comparison to other areas of the blade. Generally earthmoving blades are quite expensive and represent a substantial financial loss if a blade needs to be replaced before the useful life of the earthmover is expired.

To prevent the accelerated wear and breakage of the corners of the blades, it has been customary to mount wear plates or corner bits over the blade corners to protect the blades. Frequently the wear plates or corner bits are bolted to the blade in the hopes that they can be readily removed when they are broken or show considerable wear. More often than not the bolts are deformed or rusted requiring the cutting of the bolts to remove the wear plates from the blade. To perform this task the earthmover has to be taken from the job site to a facility that has a cutting torch or alternatively bringing a cutting torch to the job site. Considerable down time is involved in cutting the corner bit or wear plate from the blade and then replacing it with a new one.

Furthermore, each wear plate or bit is quite expensive. Each has to be precision formed to be able to be precisely mounted to the wear plate. Only a small portion of the wear plate is worn away. The rest of it is discarded.

One principal of this invention is to provide a corner bit assembly that may be readily mounted to a blade corner in which the bit can be readily removed and replaced at a considerably lower cost than previous bits that have been used.

An additional object of this invention is to provide a novel two piece bit assembly, one piece of which remains on the blade and supports a second readily removable piece, most of which can be worn away before it needs to be replaced.

A further object of this invention is to provide a novel bit assembly that substantially reduces the down time required to replace the corner bits.

An additional object of this invention is to provide a bit assembly that is relatively inexpensive to manufacture, simple to mount to a blade and structurally efficient.

A still further object of this invention is to provide a two piece bit assembly having an adapter and a bit in which the bit can be readily mounted on the adapter in a structurally secure manner with a minimum of fastening devices.

An additional object of this invention is to provide a bit and adapter assembly that can be connected together to form an integral ground engaging unit for protecting the blade.

These and other objects and advantages of this invention will become apparent upon the reading of the following description of a preferred embodiment of this invention.

BRIEF DESCRIPTION OF THE DRAWING

A preferred embodiment is illustrated in the accompanying drawings in which:

FIG. 1 is a fragmentary perspective view of the front portion of an earthmover showing a corner bit assembly mounted on the corner of the earth moving blade;

FIG. 2 is a fragmentary perspective view of the bit assembly and a section of the blade with the assembly parts separated;

FIG. 3 is an enlarged sectional view taken through the assembled adapter and blade on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary cross sectional view taken along line 4—4 in FIG. 3.

DESCRIPTION OF THE PREFRRED EMBODIMENT

This invention concerns a corner bit assembly for earthmoving blades that are attached to earthmovers such as bulldozers, scrapers, graders and the like. For purposes of illustration FIG. 1 shows a fragmentary portion of the front of a bulldozer **10** having an earthmoving blade **11** mounted in front thereof for excavating earth as the bulldozer is propelled. A corner bit assembly, generally designated by the numeral **12**, is mounted on the corner of the blade for protecting the blade. The bit assembly **12** has two principal parts—an adapter **14** and a bit **15**.

The adapter **14** has a mounting section **16** (FIG. 2) with a bit support face **18**. The section **16** is tapered, increasing in thickness from the back edge **17** toward the face **18**. The mounting section **16** has its front face **18** substantially perpendicular to the blade engaging face **19** of the mounting section. Countersunk holes **20** are formed in the section **16** to match the holes **21** in the blade **11** for facilitating the attachment of the adapter **14** to the blade **11**.

The bit support face **18** of the adapter is a shoulder surface that faces downward and forward when the adapter is attached to the blade. Tapered fingers **22**, **23**, **24** and **25** extend from the face **18** forward, downward and outward for supporting the bit **15** and aiding in transferring forces applied to the bit uniformly to the blade. As shown in FIG. 4, the fingers **22–25** are tapered with the front surface **26** and back surface **27** of each finger converging to form a bottom tip **28**. The fingers **22–25** have triangular shaped side surfaces **29–32** respectively that face outward toward the end of the adapter **14**.

The tapered fingers **22–25** have triangular side surfaces **33–36** opposite the surfaces **29–32**. The side surfaces **33–36** are contoured to form curved corners with the bottom tips **28** for facilitating the mounting of the bit **15** to the adapter **14**. The fingers **22–25** are spaced apart to receive complementary elements of the bit **15**. Concavely curved surfaces **37–39** between the fingers **22–25** facilitate the snug mounting of the bit to the adapter.

A rib **40** (FIGS. 2 and 3) is formed on the finger **22** and projects outwardly from the side surface **29** for providing an interlocking element to fit within a complementary element of the bit. Indentations **41** and **42** (FIG. 2) are formed in the side surfaces **33** and **35** respectively for facilitating the securing of the bit to the adapter.

The bit **15** is tapered (FIG. 3) with a front surface **43** and a back surface **44** converging to form a bottom cutting tip **45**. The bit **15** has an outer end face **46** (FIG. 2) and an inner end face **47**. The outer end face **46** and the front surface **43** intersect to form a side cutting edge **48**. The bottom cutting tip **45** and the side cutting edge **48** intersect to form a curved corner **49** that represents the outermost projection of the cutting profile of the blade. The bit **15** has an upper shoulder surface **50** (FIG. 4) for abutting against the front face **18** of the adapter **14**.

Finger cavities **51**, **52**, **53** and **54** are formed in the shoulder surface **50** for receiving respective fingers **22–25**. Lands **55–57** (FIG. 2 and 3) which separate the cavities, are formed to slide between the fingers **22–25**. The ends of the lands **55–57** are convexly curved to snugly engage the curved surfaces **37–39**.

The bit **15** has an interlocking element for combining with the rib **40** to hold the bit to the adapter. The interlocking element is an indentation or groove **58** (FIG. 2 and 3) formed in the wall of the cavity **51** for receiving the rib **40** therein.

To prevent the bit **15** from being pulled from the adapter **14** when the earthmover **10** moves rearward, scraping the bit along the ground, the fastening mechanisms are provided for secuerly holding the bit to the adapter. The fastening mechanisms include apertures **59** and **60** (FIG. 2) that extend from the front surface **43** to the back surface **44** of the bit. The apertures **59** and **60** are so aligned that they form indentations in the side walls of the lands **55** and **57**. The indentations **41** and **42** in the fingers **22** and **24** of the adapter **14** and the indentations in the walls of the lands **55** and **57** form substantially circular apertures when the bit is mounted on the adapter. Knock-out pins **61** and **62** are mounted in the apertures **59** and **60** to prevent the bit **15** from being pulled from the adapter.

To mount the bit assembly **12** to a blade one merely positions the adapter with the mounting section **16** over the lower edge of the blade **11** until the holes **20** of the adapter are aligned with the blade holes **21**. The operator then inserts bolts through the holes **20** and **21** to securely fasten the adapter to the blade. The bit **15** is then mounted on the adapter by first mounting the outermost end of the bit on the adapter so that the finger **22** slides into the cavity **51** with the rib **40** sliding into the indentation **58**. Then the remainder of the bit is pivoted upwardly to slide the fingers **23**, **24** and **25** into the cavities **52**, **53** and **54** respectively. The side surfaces of the fingers **22–25** respectively are so contoured as to enable the bit to be pivoted upwardly about the pivot point determined by the location of the rib **40** in the indentation or groove **58**. In this manner, the upper shoulder surface **50** of the bit **15** engages the lower face **18** of the adapter to prevent movement of the bit with respect to the adapter.

To prevent the bit from being pulled away from the adapter the knock-out pins **61** and **62** are inserted through the apertures **59** and **60** to lock the fingers **22** and **24** in their respective finger cavities. It should be noted that the knock-out pins have a central rubber section that provides a certain amount of resiliency in the knock-out pins to facilitate their removal.

When the bit becomes worn, it can easily be removed and replaced by punching out the knock-out pins and pivoting the bit downwardly and outward. Then a new bit can be easily mounted on the adapter without any special tools and in a minimum of time.

The wedge shape of the adapter **14** in cross section provides a substantial front face **18** to receive the thrust of the bit **15**. This also helps to point the tapered fingers at the most advantageous angle to provide adequate strength as the bit wears away. The broken line X—X indicates roughly the line to which the bit wears before it becomes too weak. Substantially more than half the volume of the bit can be worn away before replacement.

The fingers are pointed in a direction substantially parallel to the outer end faces of the adapter and the bit. The greatest thrusts are against the outermost corner of the bit. By directing the fingers this way, these thrusts are better distributed to the adapter **14** from the bit.

It should be understood that the above described embodiment is simply illustrative of the principles of this invention and numerous other embodiments may be readilly devised by those skilled in the art that encompass the principles of this invention and fall within the scope thereof. Therefore, only the following claims are intended to define this invention.

1. A corner bit assembly for an earthmoving blade comprising:

(a) a support adapter mounted on the lower front corner face of said earthmoving blade, said adapter having an outer support finger and a plurality of inner support fingers extending downward and outward;

(b) a bit mounted on the support adapter having a complementary outer finger cavity and a plurality of inner finger cavities with walls formed therein receiving the respective outer and inner adapter support fingers;

(c) said outer support finger and cavity having an interlocking complementary side rib (**40**) and the indentation (**58**) to hold the bit to the adapter;

(d) said bit having one or more apertures extending therethrough intersecting the walls of one or more of the inner cavities and the sides of one or more of the inner fingers; and

(e) a knockout pin mounted in each aperture engaging a cavity wall and an inner finger to force the bit laterally on the adapter to securely maintain the rib (**40**) in the indentation (**58**) to prevent separation of the fingers from the cavities.

2. A corner bit assembly for an earthmoving blade as defined in claim **1** wherein the knockout pin has a resillient section for biasing the bit laterally on the adapter and for permitting the easy removal of the knockout pin from the aperture.

3. A corner bit assembly for a blade of an earthmoving vehicle such as a bulldozer, grader and the like, said assembly comprising:

(a) a support adapter for mounting to one of the lower corners of the blade, said adapter including

(1) a wedge shaped blade mounting adapter that includes a rear face that seats on the lower front face of the blade, the adapter having bolt holes aligned with bolt holes in the blade for facilitating the rigid attachment of the adapter to the blade;

(2) the adapter having a front face facing downward and forward when the adapter is attached to the blade and a plurality of parallel tapered fingers extending from said front face in an inclined outward angle to the front face, and wherein the outermost finger has a side rib (**40**) formed thereon;

(b) a bit form removably attaching to the adapter, said bit having an upper rear face (**50**) for abutting the adapter front face and a plurality of tapered finger cavities for receiving respective adapter fingers in which the outermost finger cavity (**51**) has a side indentation (**58**) for receiving the finger side rib and wherein the cavities have a configuration such that the bit is mounted to the adapter by first posi-

tioning the outermost end of the bit on the adapter with the finger side rib (**40**) in the bit cavity indentation (**58**) and then secondly pivoting the other end of the bit on the adapter so that the fingers slide into their respective cavities; and

(c) resilient knock-out pins mounted in apertures formed in the bit and adapter fingers to prevent the inadvertent removal of the bit from the adapter.

4. A corner bit assembly as defined in claim **3** wherein one side surface of each finger is contoured to permit the pivotal movement of the bit to slide the fingers into the cavities so that the upper rear face (**50**) of the bit abuts against the front face (**18**) of the adapter.

References Cited

UNITED STATES PATENTS

1,803,654	5/1931	Ronk	214—145
2,732,639	1/1956	Lillengreen	37—141 X
2,965,989	12/1960	Hibbard	37—141 X
3,029,534	4/1962	Rakisits	37—141
3,032,901	5/1962	Dils	37—141
3,089,261	5/1963	Flath	37—118
3,160,967	12/1964	Nichols	37—141

EDGAR S. BURR, Primary Examiner

U.S. Cl. X.R.

37—61, 72; 285—261