

2022 INNOVATION CHAMPIONS CONTEST

Title: Cutting Edge Carrier

COUNTY: Stark County Highway Department

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PROBLEM STATEMENT: Motor graders blading gravel roads, each cover an area ranging from 50 to 75 miles. The grade raises on the gravel roads vary. As a result of the varying grades, the cutting edges on the motor graders wear out and need to be replaced with new cutting edges. At times, a motor grader would be 25 to 30 miles from a shop when new cutting edges were needed. The operator would either drive the motor grader to the shop at 25 mph or have the tool truck haul cutting edges to the location at the posted speed limit. The height of the bed on the tool truck made it a challenge to load cutting edges. Also, there was no way to secure the cutting edges in the tool truck once loaded for transport except to slide them under the toolbox.

SOLUTION: Two receiver tubes were attached to the hitch on the tool truck. Each receiver tube is designed to hold a cutting-edge carrier. Each cutting-edge carrier is designed with a bracket and a couple of holes. The cutting-edge carrier bracket slides into the receiver tube and is pinned to secure it. Another hole and pin on the carrier are used to hold the cutting edges in place during transport. To ensure the pins matched the cutting-edge bolt spacings, the receivers had to be precisely placed. There are two cutting edge carriers per truck. Typically, the carriers will carry two cutting edges to a worksite.

When not in use, the cutting-edge carriers are safely held on two stow-away bracket holders on the bed of the truck. A holder is installed on each side of the tool truck bed for easy access.

LABOR, EQUIPMENT, AND MATERIAL:

Equipment used:

Welder

Chop saw

New Material:

(2) receiver tubes

(2) receiver pins

3' tubing - 2" x 2" x 3/16"

14" tubing - 2-1/2 x 2-1/2 x 3/16"

40" flat bar - 3 x 1/2" f

12" miscellaneous gusset material

1 can primer

1 can paint

(4) cotter pins

(2) reflectors

This makes 2 cutting edge carriers per truck.

Labor Hours: *(Includes time needed for design and discussion.)*

1 person – 8 hrs.

COST SUMMARY:

Metal pieces, welding supplies, and paint - \$250.00

Total Cost: \$ 250.00 plus labor

SAVINGS AND BENEFITS:

Cutting edges no longer slide around in the back of the tool truck. The pins in the stinger holders (carriers) ensure the cutting edges are always secured when being transported. This increases safety for the truck driver and the motoring public.

The height of the carriers makes it very easier and safer to load and unload cutting edges verses using the tool truck bed which is quite high. The lower height means there is less chance for personal injury when lifting.

Using the tool truck traveling at the posted speed limit to transport the cutting edges as opposed to driving a maintainer at 25 mph to the shop results in less time needed for travel, and gives the motor grader operator more time to blade the road.

This innovation has increased efficiency and safety and presents a savings in time and money.

ANNUAL OPERATING COSTS:

Prior to using the innovation -

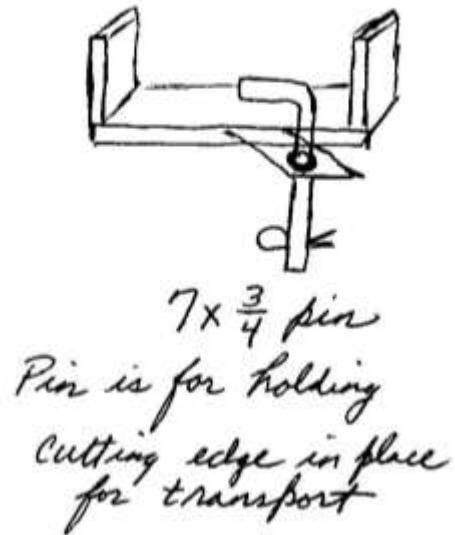
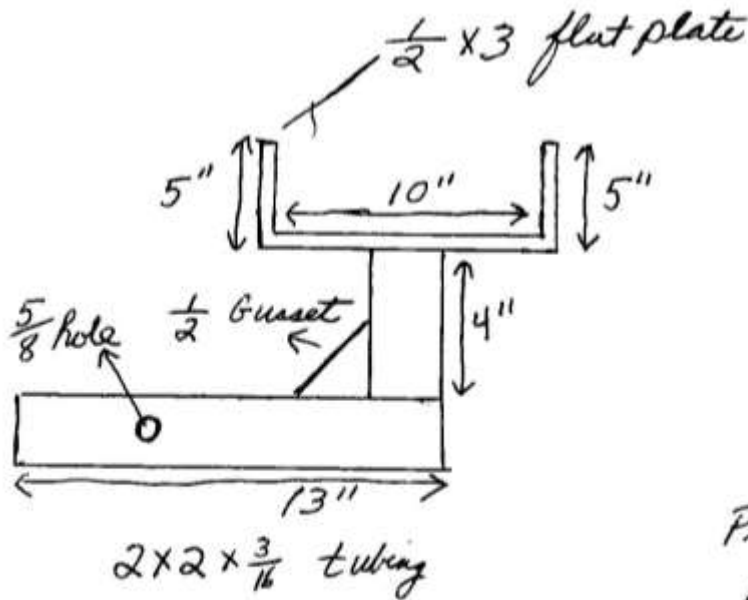
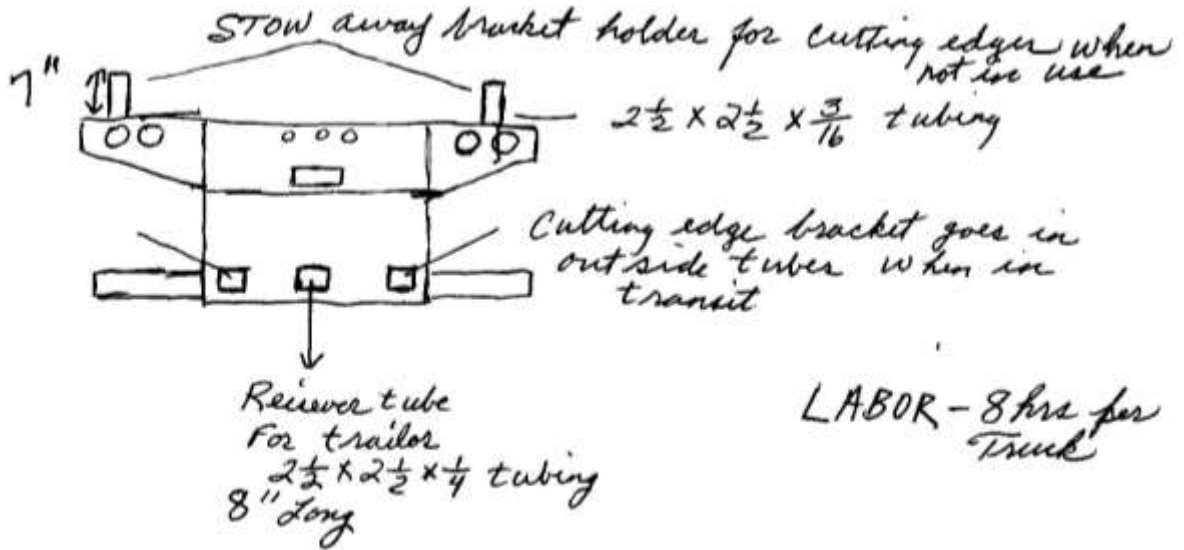
The grader had to be driven back to the shop to get the cutting edges changed. A motor grader traveling at 25 mph to a shop 25 miles away took one hour. Another hour was needed to remove and install the new cutting edges. It then took another hour to return to the worksite location. Three hours of motor grading time was lost.

If the tool truck, equipped with an air impact wrench, was driven to the location, the cutting edges were lifted from the high truck bed. The cutting edges were loose on the tool truck bed and would slide around. This presented safety concerns, both for road department personnel and for the motoring public.

After using the innovation –

The motor grader operator now makes a phone call to the shop. Cutting edges are loaded onto the cutting-edge carrier and secured. The tool truck traveling 25 miles at the posted speed limit to the worksite and changing out cutting edges reduces the time lost for motor grading. The carriers (stinger holder) and pins create safe handling and hauling of new cutting edges to the worksites.

SCHEMATIC WITH DETAILS:



2 Cutting edge carriers per truck



Secured to the receiver hitch with pins



Cutting edge carrier on tool truck safely carries cutting edge(s)



Pins secure cutting edge to carrier



2 receiver tubes welded to hitch on tool truck



Attach cutting edge carrier to receiver tube. Secure with pins



When not in use, carriers are secured to 2 bracket holders on tool truck bed.



Cutting edges are safely transported on cutting edge carrier mounted on tool truck

