A stylized graphic of an eye, where the iris is a circular arrangement of small, dark, rectangular segments. The pupil is a dark, irregular shape. The text "tips from the field" is written in a white, sans-serif font, following the curve of the upper eyelid.

tips from the field

A stylized graphic of an eye, where the iris is a circular arrangement of small, dark, rectangular segments. The pupil is a dark, irregular shape. The text "trucks and loaders" is written in a white, sans-serif font, following the curve of the lower eyelid.

trucks and loaders

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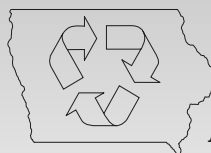
## tips from the field: trucks and loaders



### *— Iowa Transportation Center*

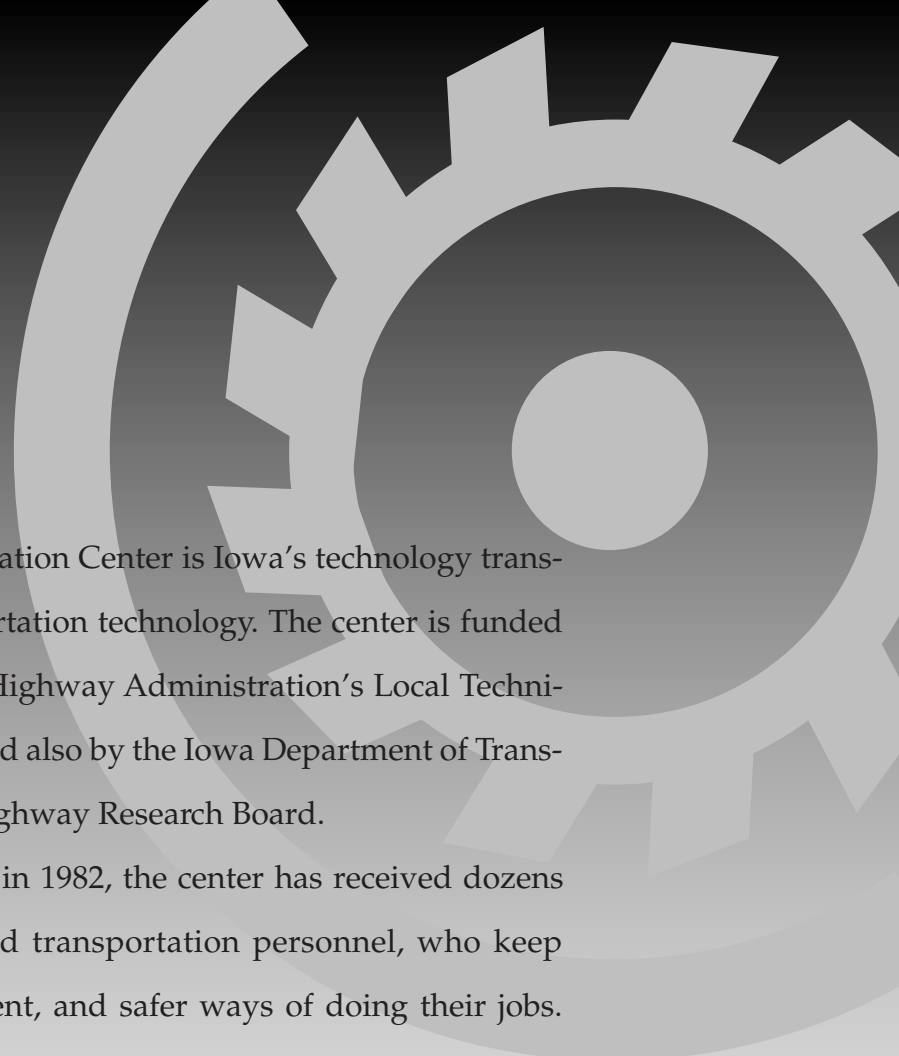
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**May 1995**



The Iowa Transportation Center is Iowa's technology transfer (T<sup>2</sup>) center for transportation technology. The center is funded primarily by the Federal Highway Administration's Local Technical Assistance Program, and also by the Iowa Department of Transportation and the Iowa Highway Research Board.

Since its beginning in 1982, the center has received dozens of excellent tips from field transportation personnel, who keep finding faster, more efficient, and safer ways of doing their jobs. Through the years, we have published these tips in our newsletter, *Technology News*, and in collections like this one.

This newest Tips from the Field booklet brings together some of the best of these tips regarding the operation of trucks and end loaders. We hope you find an idea here you can use in your own operation.

And if you have a tip to offer—an idea or innovation that's saved you money or made your job easier or safer—please contact our editor. We are currently paying \$100 for any tip we publish in our newsletter.



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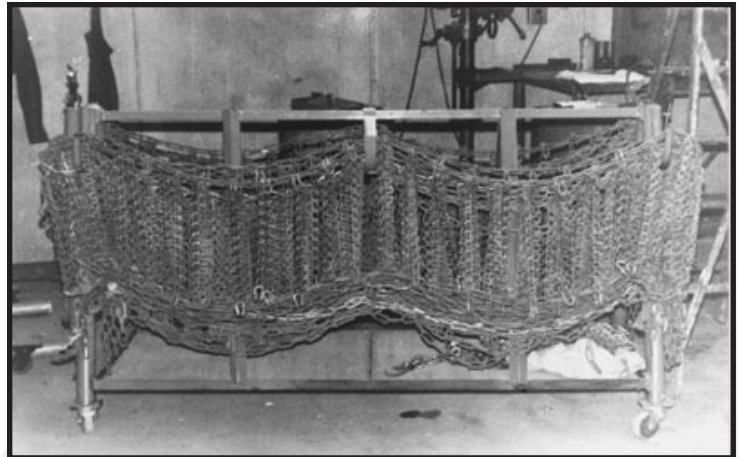
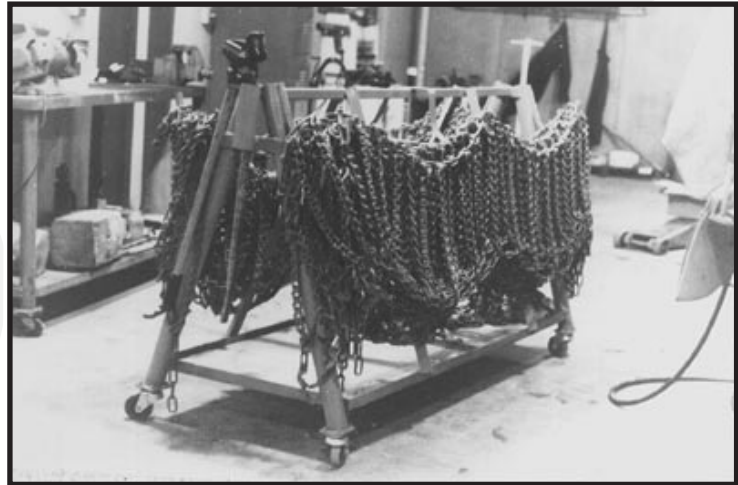
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The City of Spencer, Iowa has developed an efficient way to store truck chains. A storage rack keeps the chains clean, safe, and ready for use.

Only repaired chains are stored on the rack, so that they can be removed directly from the cart and applied to the tires without worry of them being faulty.

The A-frame is made up of 2-inch pipe with 1-inch square tubing for the longitude connecting rod. The intermediate chain support pieces are also made of the 1-inch square tubing.



## Chain rack



For more information, contact  
Charles Fisher at 712/264-7220.

In addition to the triangular “slow moving vehicle” sign, Roger Clark, Clay County Engineer, has attached a rectangular sign asking drivers to “stay back 50 feet” from special vehicles such as farm and snow maintenance machinery. The signs remind vehicles approaching from behind to allow room for emergency stops.

The sign is reflective, as is the presently used triangle, and displays black letters on a white background. Most city or county sign shops should be able to manufacture such a sign.



## “Stay Back 50 feet” sign



For more information, contact Roger Clark at 712/262-2825.



## Vehicle warning reflective tape

Charles Fisher, Spencer, Iowa's superintendent of public works, has made the city's service and emergency vehicles more vivid during night hours with the use of 3M reflective tape. A strip of 3M reflective tape can be placed on either side and on the rear of emergency vehicles such as rescue vans and snow plows, to warn vehicles of their location.

Most public works offices already have the reflective tape or can purchase it through normal supply outlets.

For more information, contact Charles Fisher at 712/264-7220.

A pickup mounted hoist is being used by the Fremont County Secondary Road Department for loading and unloading items such as oil drums, large tires on rims, and other heavy equipment parts. The hoist was developed by shop mechanic Rich Barrett, who got the idea from a magazine article describing how to construct a similar device.

The hoist consists of three main parts: a base that mounts in a pickup box, a mast, and a boom. The base is fabricated from 3/8-inch steel plates and holds a 4-inch ID pipe that acts as the mast's sleeve. The base is bolted to the pickup box, and can be easily removed when not in use.

The mast is a 3 1/2-inch ID pipe with gussets welded to it to support the hoist jack. The boom consists of square steel tubing, and is hinged to the mast with a 3/4-inch bolt supported by steel plates welded to the top of the mast. By using two different sizes of tubing (3-inch and 2 1/2-inch), the boom can be made with a variable length of reach.

Plates are welded to the larger boom near the mast to support the ram of the jack. A plate with a hole to receive and lock in a hoisting chain is welded to the end of the smaller tubing. Both tubes are then drilled at regular intervals so that the smaller tubing can slide out for a longer boom reach. A bolt through both tubes is all that is needed to secure the boom length.

A standard 3-ton jack is used to raise the boom arm and the load. The boom is free to swing a full 360 degrees. The mast sleeve is equipped with a grease zerk for lubrication, and a rubber collar at the joint to preclude rainwater entry.

The pickup mounted hoist can easily load and unload 1,000-pound items into and out of the pickup. It has saved manpower and backs, and would be a worthwhile addition to many equipment maintenance shops. Materials for the apparatus cost approximately \$200 including the jack. It takes an estimated eight hours to construct.

For more information contact Rich Barret at 712/374-2613.



## Truck-mounted hoist





# Truck-bed protector rails

Extending the life of equipment and preserving trading value is important for any city unit, and the City of Clive Public Works Department has discovered a simple way to protect its pickup trucks and keep them looking in good repair.

Clive uses old 2-inch street pipes to make a type of railing along the sides of their pickup beds. Short vertical extensions are added to insert into stake slots and secure the railing. Tailgates are protected by welding a heavy piece of angle iron to the top of the gate. Both of these measures reduce denting and battering from loading and unloading equipment and supplies, and a coat of matching paint makes them look like an original feature of the truck.

The size of angle iron, which is attached by metal screws, will vary with the length and width of the tailgate.


For more information, contact Willard Wray at 515/223-6230.



## End loader bucket expander

An end loader bucket expander attachment that fits into a regular end loader bucket is often used in the winter to allow end loaders to carry more snow. The larger bucket works well with light fluffy snow, but can be hazardous if mistakenly used to load heavy sand or gravel. A large bucket of sand could cause the end loader to overbalance and tip.

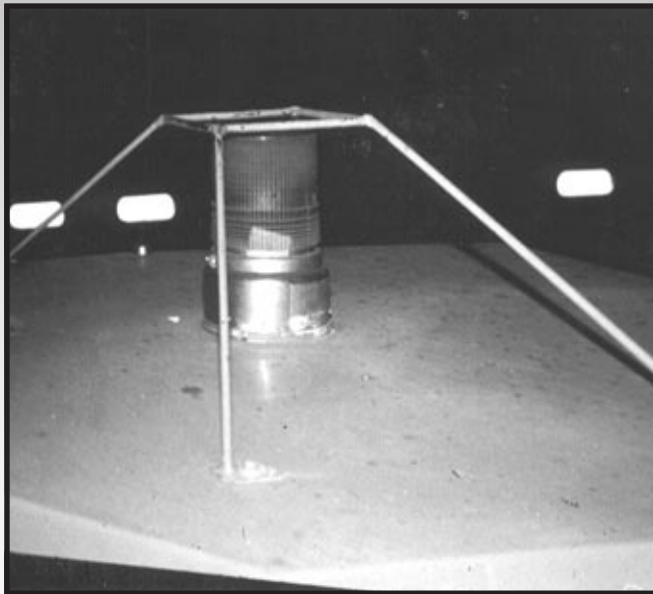
The City of West Des Moines has added a stenciled warning to the attachment side of the snow bucket to alert operators to possible hazards.



For more information, contact  
Bob Dingman at 515/222-3480.



## Top-mounted light guards



To protect top-mounted lights on tall machinery such as plows and end loaders from low branches, signs, or ceilings, the City of Clive Public Works Department has bolted metal cages made of old angle iron over the vehicles' top lights. Broken lights cost \$100 to \$150 each to replace, so the protectors can save a great deal of money. There is also a safety factor, because often the lights are broken while out on the street when the lights are needed.

Both types of protectors start as a small welded square with four angled legs attached to brackets bolted to either the roof of the cab or the roof edges.

For more information, contact  
Willard Wray at 515/223-6230.



## Pickup top light and antenna mount



The City of Clive Public Works Department has devised several mounts for pickup top lights and radio antennas. Usually these items are bolted to the cab of the truck, but Clive's mounts are bolted to the tool box in the back and stick up above the cab, eliminating the need to drill holes in the cab and preserving trading value.

For a tool box behind the cab, a vertical pole is bolted to the box with a bracket. The light sits atop the pole and an antenna bracket, curved like a stair step, reaches above the cab.

The second model works when two toolboxes are situated along the sides of the bed. A metal pipe mount similar to a roll bar is attached to the front of the truck bed and the light and antenna are fixed on top of the bar.



For more information, contact Willard Wray at 515/223-6230.

Not enough emphasis can be placed on safety in the work place. These photos illustrate two safe ways for an employee to climb into a dump truck bed.

The first photo shows how the City of Des Moines tackled the problem. A ladder welded to the side of the truck spells out exactly where an employee should be climbing in and out of the truck.

The second photo shows a dump box that has two painted stripes on top of the bed and the word "step" on the side giving the exact location of the dump truck's dual tires.

For more information, contact  
John Bellizi at 515/283-4276.



## A step towards safety



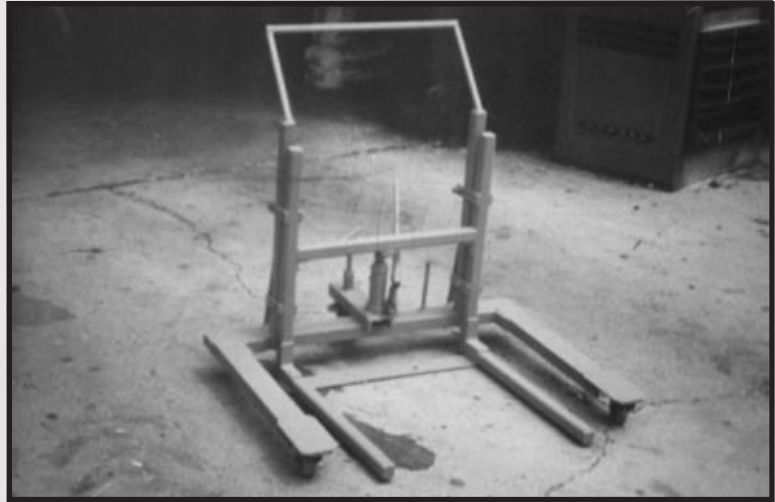
A section of conveyor belt, combined with mud flaps, can protect a truck equipped with a rear-end sander from the corrosive effects of sand and salt.

The section belt is simply installed across the width of the back end of the truck. The belt and mud flaps protect the undercarriage, the brake system, and the spoke area of the wheels from sand and salt being thrown out by the spinner.

## Undercarriage salt protector

For more information, contact Willard Wray at 515/223-6230.





## Cart handles dual wheels with ease

Because of the number of times it's had to fix brake or axle problems on dual-wheel vehicles, Ankeny's Public Works Department designed a cart that lets employees work with two wheels at a time.

A close look at this photo will show how the cart sits on three wheels, allowing it to rotate through 360 degrees.

The dual-wheel cart not only reduces the amount of heavy labor needed to maintain dual-wheel trucks, but also improves safety conditions for the employee.

For more information, contact  
Dick Ash at 515/964-5500.



## Hoist trouble light

Maintenance personnel have found the hoist trouble light to be a particular asset while working under a hoist, or on tall pieces of equipment such as loaders, sweepers, and motor graders.

The trouble light consists of two 4-foot long fluorescent light rods (covered by plastic protector tubes) that are joined to a workbench. One of the lights is attached to a movable overhead arm that swings 270 degrees on its vertical axis and 360 degrees on its horizontal axis. In addition, the entire arm can be raised or lowered to any height the situation demands.

The second light, a stationary vertical light attached to the end of the bench, aids

in the illumination of the bench and surrounding work area. The bench is composed of 3/4-inch plywood with a laminated top, mounted on 1-1/4-inch angle iron with castors. The mast arm is made of EMT conduit (3/4-inch for the arm; 1 inch for the sleeves the arm fits into). The arm can be adjusted to a height that provides light from above, allowing for excellent illumination of the engine and other parts.

The hoist trouble light was developed by the Spencer Public Works Department for use in their maintenance and repair shop. The entire apparatus weighs about 50 pounds, and materials to build it cost approximately \$27.

For more information, contact Charles Fisher at 712/264-7220.



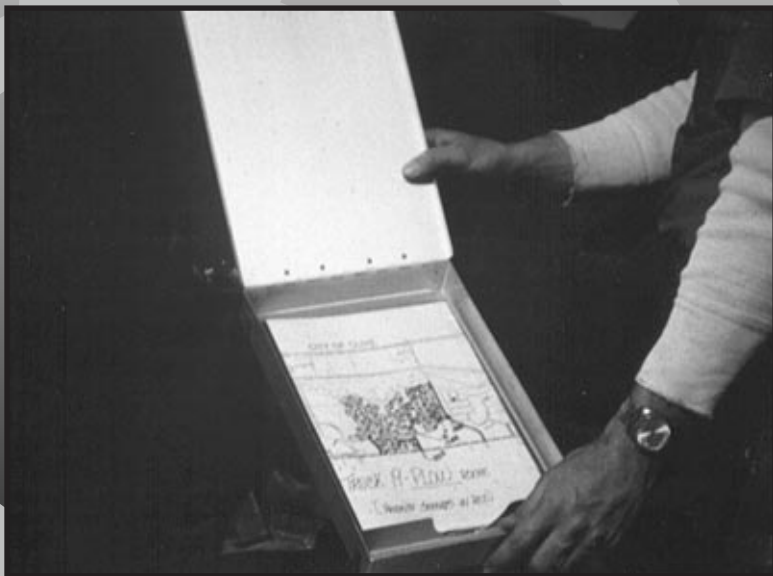
A handy storage box for snowplow maps, sanding routes, fuel tickets, and any other item used to operate a snowplow can help drivers keep those items from being scattered all over the cab and perhaps lost.

The box can be mounted in a variety of places in the cab, including on the dash or in front of the snowplow control levers. To make reading easier, a light can be installed over the box area.

For more information, contact Willard Wray at 515/223-6230.



## Storage box keeps cab uncluttered



Ice- and snow-covered roads are dangerous no matter what type of vehicle is being driven, but using tires with different treads on the front end of snowplows can improve a driver's control.

The top photo shows the most common tire tread as used in public works departments today. But after a lot of frustration on cul-de-sacs and hills, the Clive Public Works Department decided to switch to the type of tread shown in the bottom photo, and found it helps improve vehicle control.



For more information, contact Willard Wray at 515/223-6230.

## New treads keep trucks on the road





## Safety lever keeps truck beds at bay

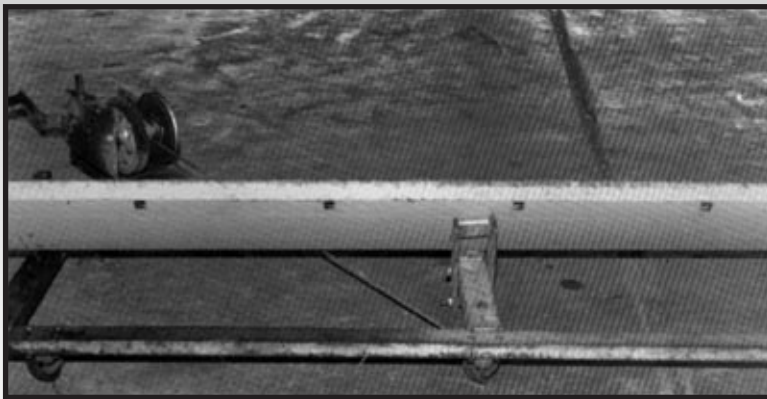
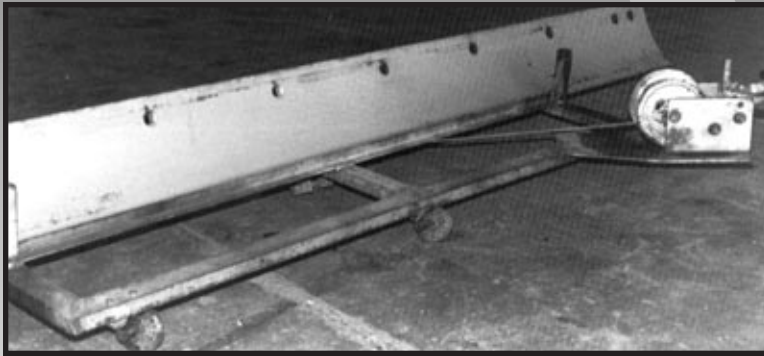
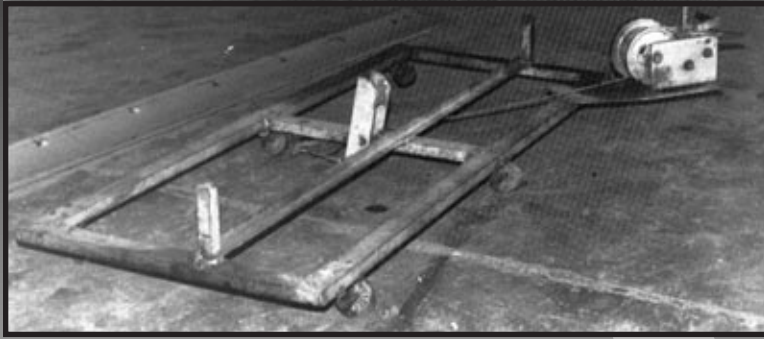
The City of Clive's Public Works Department puts a safety lever for dump bed hoists on each of its trucks.

The lever was designed for the safety of the operator or mechanic who has to work under a raised hydraulic bed.

"If your trucks do not have this now, you shouldn't go another day without installing them," Clive Public Works Director Willard Wray says. "Too many people have been killed or injured over the years while servicing hydraulic reservoirs or rams."

The rod is solid steel. The same pin used to make the hinge on the bottom of the rod is welded to the truck. When not in use, the rod lays down to the left into a receiving "U" device welded onto the side of the truck. Wray says this device is commercially available through truck distributors.

For more information, contact Willard Wray at 515/223-6230.



## Ice blade carrier

For more information, contact Robert Davis at 515/239-1033.

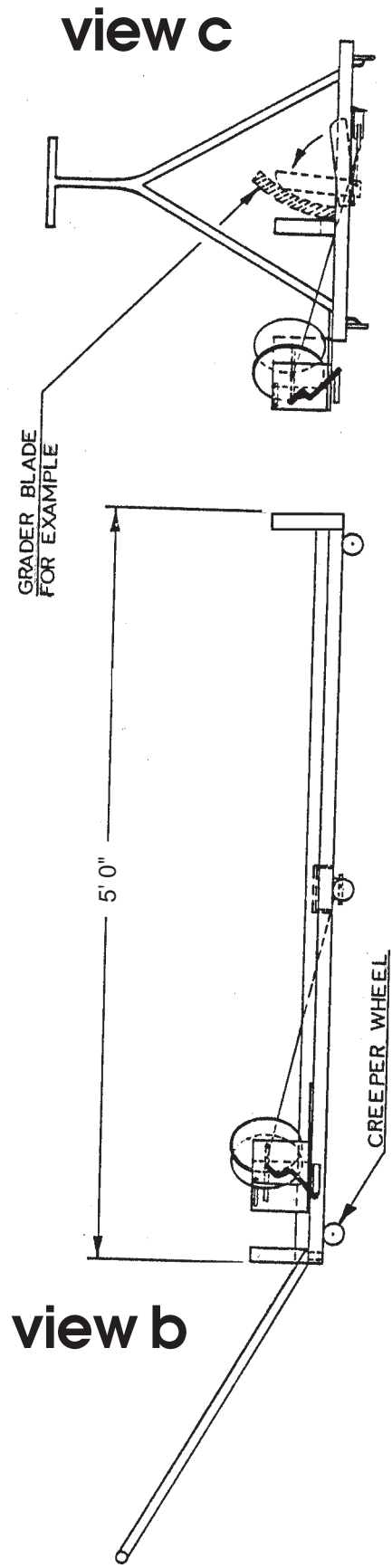
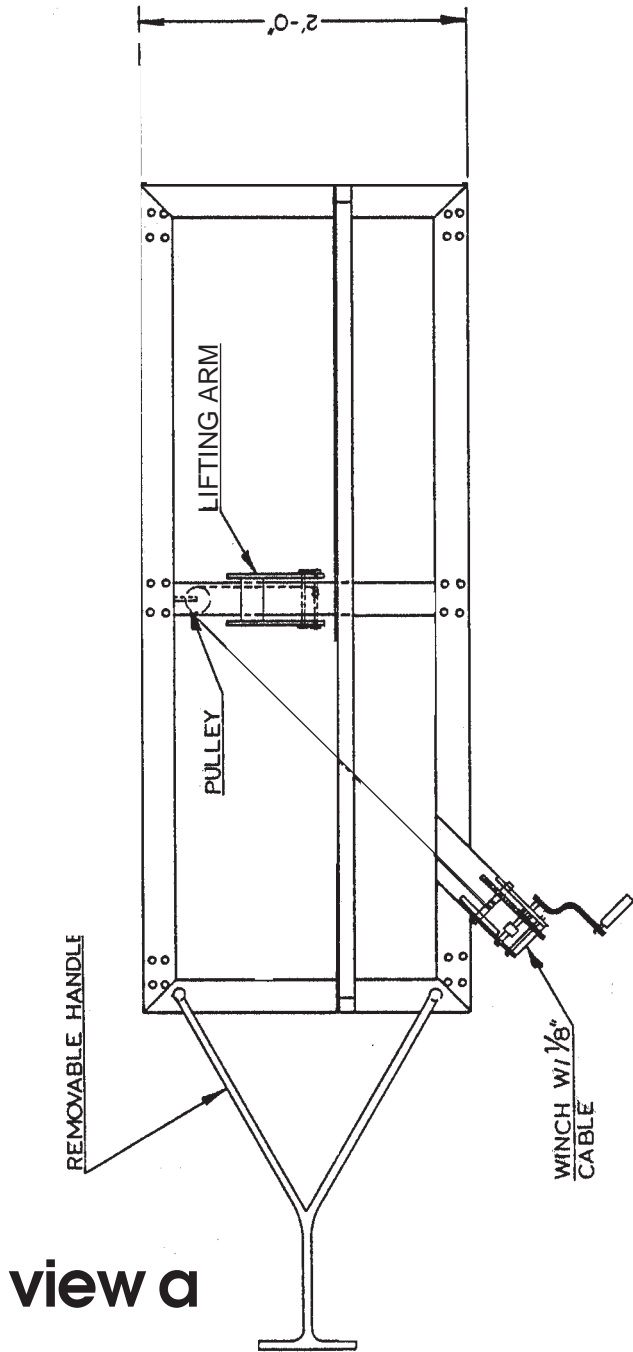
The ice blade carrier is a rectangular frame 5 feet long and 2 feet wide mounted on four casters and equipped with a winch and a lifting arm. Intended for use in mounting blades on motor graders or trucks, this device is both easier and safer than prior methods because it eliminates the need for a worker to assume awkward positions and to do excessive heavy lifting.

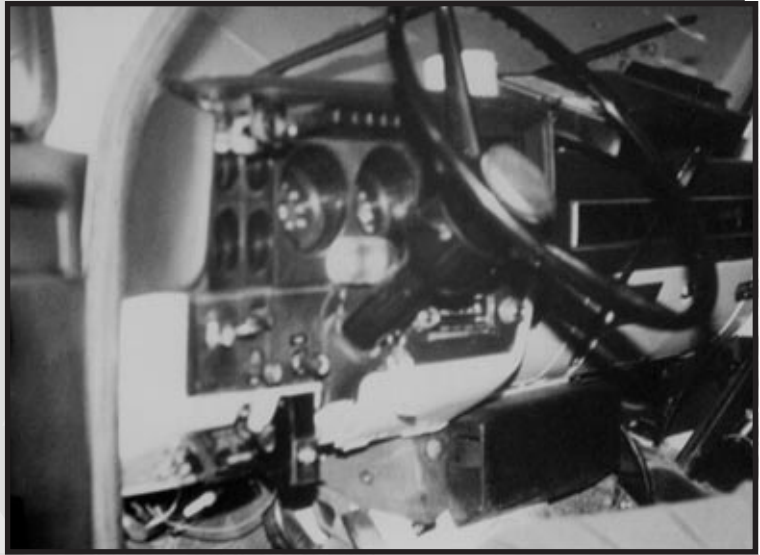
Here's how the carrier works: the chosen blade is placed on the carrier, which is then rolled into position under the machine. Using the winch and lifting arm, the blade is raised to the proper angle, and the mold board is lowered to the blade. A blade bolt is then installed at each end, and the carrier can be rolled out of the way. The remainder of the blade bolts are then inserted and tightened.

An important benefit of this apparatus is that one worker alone can perform the operation, which normally requires two or three people.

Estimated cost of the blade carrier, including labor and materials, is \$100 to \$125.

It was developed by Robert E. Davis of the Iowa DOT.





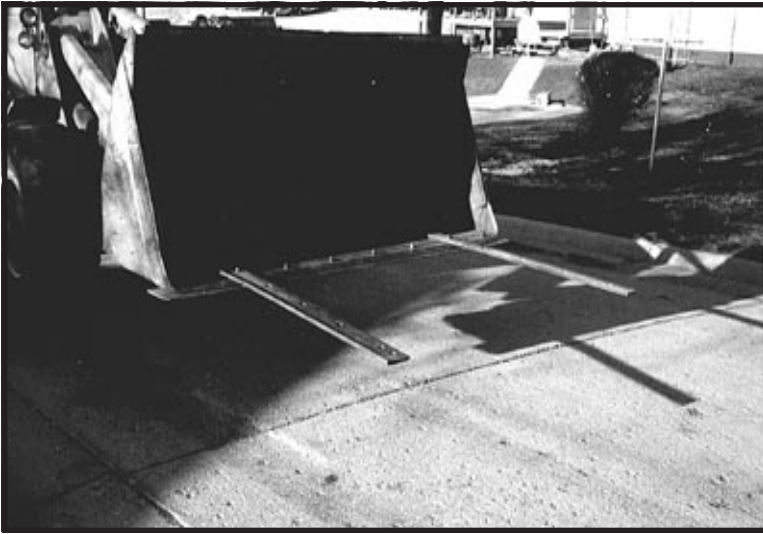
## Light saves brake pads

A yellow clearance light mounted on the dash directly above the steering wheel shaft reminds City of Clive truck drivers to release the emergency brake.

The light is wired to the emergency brake handle system. When the brake is left on, the light reminds drivers to release the brake.

“This light has saved a lot of emergency brake shoe pads,” Public Works Director Willard Wray says. “We have additional need to keep our emergency brakes in good condition because we run all automatic Allison transmissions that do not have a ‘park’ position on the gear shift.”

For more information, contact Willard Wray at 515/223-6230.



For more information, contact Don Buswell at 712/792-9869.

From the City of Carroll come a couple of quick tips to expand the functions of bucket loaders and tractors equipped with a bucket. Used in combination, these tips help make brush pickup easier.

Don Buswell, street superintendent for the City of Carroll, says his department needed something that would pull stacked brush piles onto the street. His answer was to get a small tractor with a bucket attachment and a pair of old plow shanks obtained from a salvage yard. As shown in the top picture, Buswell attached the shanks to the tractor's loader bucket by simply drilling a pair of holes on each side of the bucket.

Buswell uses his loader modification for other tasks as well. It can be used to lift up cement, like old sidewalk panels. He also uses a clevis at one end and uses the hook to remove heavy brush from creeks.

"These old plow shanks are very strong and it would take a pretty hefty machine to bend them," Buswell says.

Buswell also wanted a way to pick up large piles of brush that had been pulled into the street with a regular loader bucket. The bottom picture shows how he modified the loader by taking a pair of worn motor grader blades (6 feet x 3/4 inch) and bolting them onto the bucket.

## Turn loaders into brush pluckers



## Trailer transports 8 barricades

Barricade trailers adapted from old DOT skid trailers allow Cedar County's maintenance crews to quickly transport up to eight barricades.

Rodger Albaugh, a county maintenance employee, came up with the original idea. Working with crew leader Mike Steffen, John Mellecker, and County Engineer Mark Nahra, Albaugh developed the idea into the trailer shown in the photograph.

"These trailers allow us to quickly haul eight Type III barricades behind a pickup, allowing one or two crew members to quickly close an intersection or road," Nahra says. "Formerly, we needed a flatbed to carry two large, wood frame barricades at a time."

The county adapts skid trailers by cutting off the old skid racks and mounting 3-inch, Schedule 40 pipes vertically to support the barricade posts. The barricade risers are made from 1.75-inch Quik Punch sign posts. The base is made by spot welding 12 gauge 2-inch Quik Punch anchor sections in 2-inch pieces of scrap angle irons.

This idea offers several advantages to city and county maintenance departments. First, time-consuming trips from the site back to the shop are eliminated. Second, these barricades are also lighter and easy to assemble.

For more information, contact Mark Nahra at 319/886-6102.



A fuel island at the Urbandale, Iowa Public Works yard was designed not only to create a dry area in which to fill up vehicles, but also to serve as protection against winds from the north and west.

For more information, contact Gary Sindelar at 515/278- 3950.

## A place to come in out of the rain



