

# He Makes U-Joints, Hinges Out Of Nuts And Bolts

By Jim Ruen, Contributing Editor

Give Fred Davison some nuts and bolts, and he'll turn them into hinges, universal joints, wire tensioners, corner post braces and more. He says the secret is to realize that a bolt and nut are more than they seem.

"Once I realized that a bolt screwed into a nut is simply an oscillating bearing, I started finding lots of applications," says Davison. "My best idea was making U-joints."

He got the idea when he needed a way to reach down under his backhoe and turn the hydraulics off or on for raising and lowering the hitch. He knew a U-joint on the end of a rod would be ideal. He didn't have one that would work, so he made one.

"I crossed 2 equal length, right-hand threaded bolts by grinding through half of the center on each and welding them perpendicular to each other," explains Davison. "I then placed nuts on the ends of the threaded bolts and welded brackets to nuts on each pair of opposing sides. Then I welded the ends of shafts to each bracket."

It's the bolts turning inside their respective nuts that make the U-joint work. Torque is transferred from one plane to another through the joint. The beauty is that the U-joint can be as small or large as needed, and they tend to stay lubricated. If needed. If necessary on a larger U-joint, he'll drill holes in the nuts for grease zerks.

"The threads are like hills and valleys. Grease has a hard time getting out, while dirt has a hard time getting in," notes Davison, explaining that very little lubrication is needed.

The gate hinges he makes are simply a bolt with 2 nuts. One nut is welded to a mounting plate or directly to a surface being hinged. A second nut is welded to the post or frame.

Aligning 2 sets of nuts and bolt hinges is made easier by temporarily threading a length of threaded rod through both sets. Once they are fixed in place, the threaded bolt is removed, and individual bolts threaded in place.

To mount a permanent gate, Davison welds nuts perpendicular to lag screw heads, turns them into a post and threads bolts into the nuts. Lengths of steel strap or flat iron attached to the gate are then welded to the top of the bolts.

"I've used nuts and bolt hinges for even heavy-duty work like hinging a rock screen for sizing gravel," says Davison. "Hinging the screen makes it easier to lift up and clear."

Davison says nuts and bolts can also be used to fasten a cable in place. He drills a hole through the threaded end of a bolt sized to match the cable.

"Drill at an angle so the bit emerges about 1/2 in. along the course of the bolt," explains Davison. "Weld or attach the bolt head to the desired surface, and bring the cable through the nut first and then through the hole, pulling it tight. Thread the nut on, and it will clamp the cable in place so it can't be pulled off. It binds the threads of the cable to the threads of the bolt."

If the cable stretches over time, simply unthread the nut, pull the cable tight again and replace the nut. He uses the same concept for a cable hook, simply drilling the hole for the cable through the end of a J-bolt or bending a standard bolt into a J.

"I use one to secure a water tank in the pickup and one for a gate winch to tighten a fence gate," says Davison.

Davison uses nuts and bolts in countless other applications on his ranch. To lock fuel tank caps, he welds a nut to the cap. He drills a hole for a padlock in a slightly smaller diameter pin, slips the pin through the nut and locks it in place. The pin is sized so as the cap is turned, the pin is unable to ride up and over the curve of the tank.

A simple belt tightener can be made by welding a bolt to a surface parallel to the belt. Davison selects an appropriate length bolt so it extends out and over the belt. After threading a matching nut onto the bolt, he welds an arm with a tightener roller at one end to the nut. A spring or weight attached to the arm maintains appropriate tension.

Davison makes a double swivel by screwing a nut on a bolt and then welding the nut to a pipe stand. "Take another nut screwed to a bolt, and weld the nut perpendicular to the first bolt head," he explains.

Anything attached to the second bolt head can turn 360° with it, but can also turn 360° around the pipe stand.

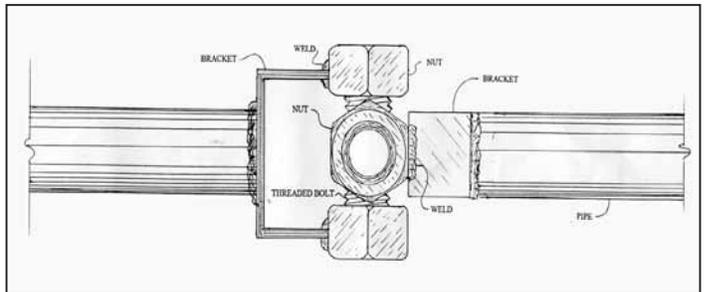
To brace corner posts with an adjustable tightener, Davison anchors a length of 1-in. pipe in concrete, angled toward the post with a nut welded at the exposed end. He turns a length of threaded 3/4-in. rod with a nut welded part way down it into the nut on the pipe. After cutting a divot out of the post to match the angle of the pipe and rod, he attaches a nut with a washer welded to it to the top of the threaded rod and turns the rod to push the post away from the pipe.

"Like so many things, it seems complicated until you realize how simple it really is," says Davison.

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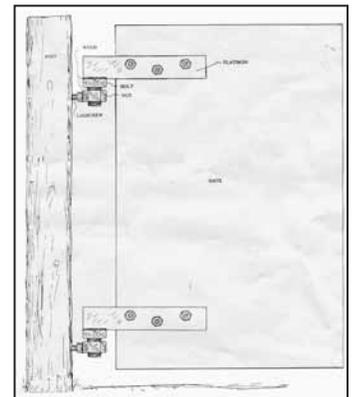
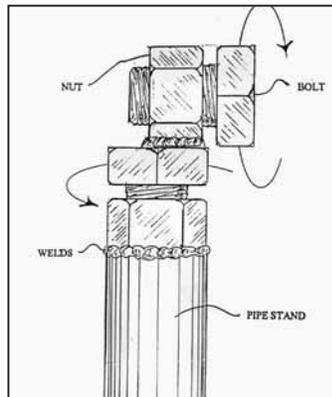
Fred Davison turns nuts and bolts into hinges, universal joints (above), wire tensioners, corner post braces and more.



Drawing above shows how Davison constructs a nuts and bolts U-joint by crossing 2 equal length right hand threaded bolts.



A simple nut-bolt combination can be used to make a sturdy gate hinge.



Double swivel (left) can be made from 2 nuts and 2 bolts welded together. Drawing at right shows configuration for a swinging gate.

## Trailer-Mounted Bug Deflector

"We would haul our tractors to shows and they'd get covered with bugs," says Dale Hiatt, Laramie, Wyo., who solved the problem by making a bug deflector for the front of his trailer by bolting together 2 air deflector side panels off a semi truck.

The two 6-ft. long panels are connected by 4 bolts and suspended about 10 in. off the trailer floor by a steel frame, which pins to the trailer. The bolted-together panels measure 36 in. wide.

"I use the trailer to haul 2 tractors to local antique tractor shows. In the past, I had to scrub off bugs when I got there. Now they stay clean," says Hiatt.

The deflectors are supported by an angle

iron frame that's braced by a pipe to the trailer frame.

The back side of the deflector is bolted to a 1-in. wide, 1/8-in. thick metal cross arm, which is welded to a 3-in. wide vertical steel bracket. The bracket is also welded onto the trailer frame and has a metal loop on top of it, allowing Hiatt to use a chain on his loader bucket to pick the unit up.

"There's minimal wind resistance and I can easily put them on with a front-end loader," notes Hiatt.

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Dale Hiatt made this trailer-mounted bug deflector by bolting together 2 air deflector side panels off a semi truck. Deflectors are supported on back by an angle iron frame.