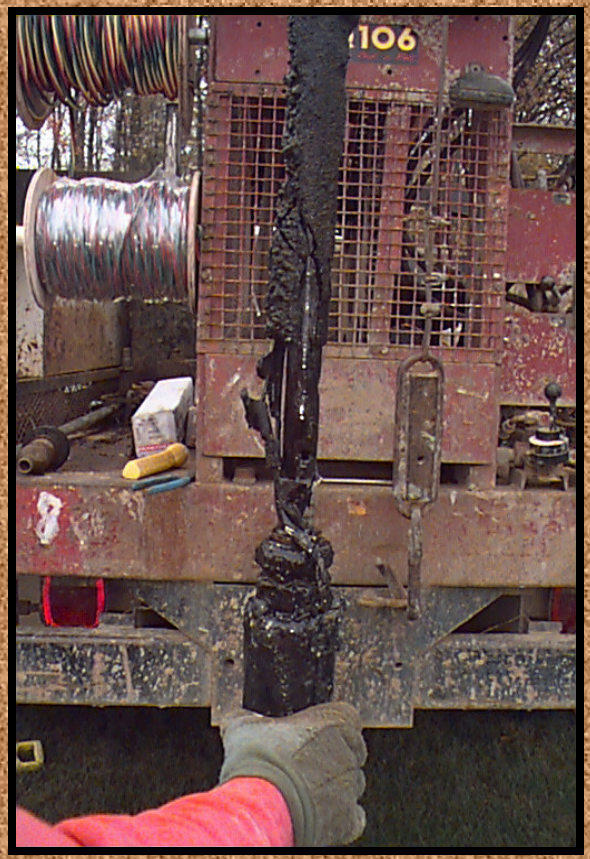
REMOVAL OF OBSTRUCTIONS FROM ABANDONED WELLS



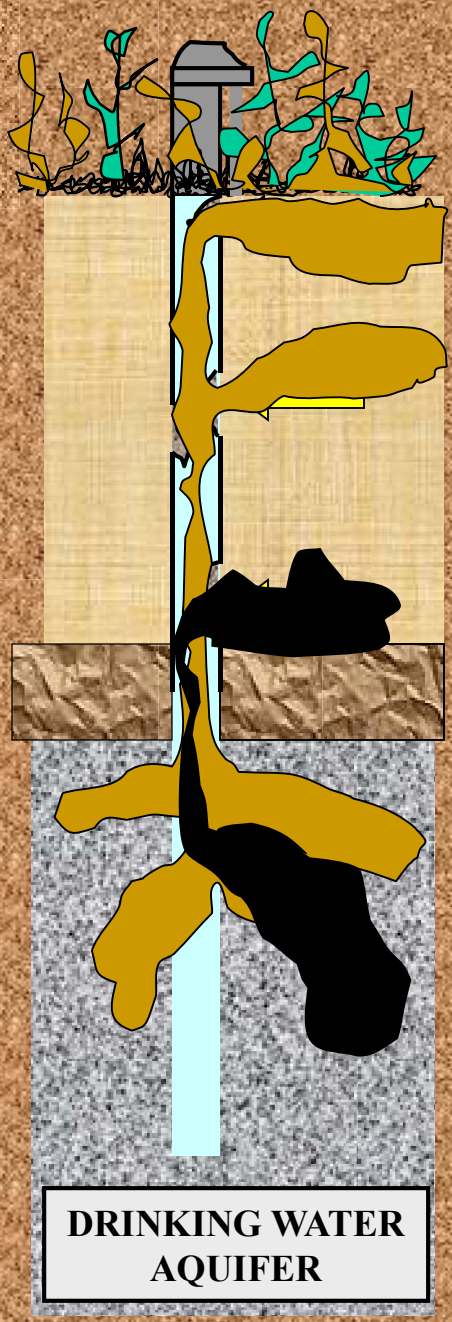
Why Are Abandoned Wells a Problem?

UNPLUGGED ABANDONED WELLS CAN ACT AS DIRECT CONDUITS BETWEEN NEAR-SURFACE CONTAMINANTS AND DEEPER DRINKING WATER AQUIFERS.

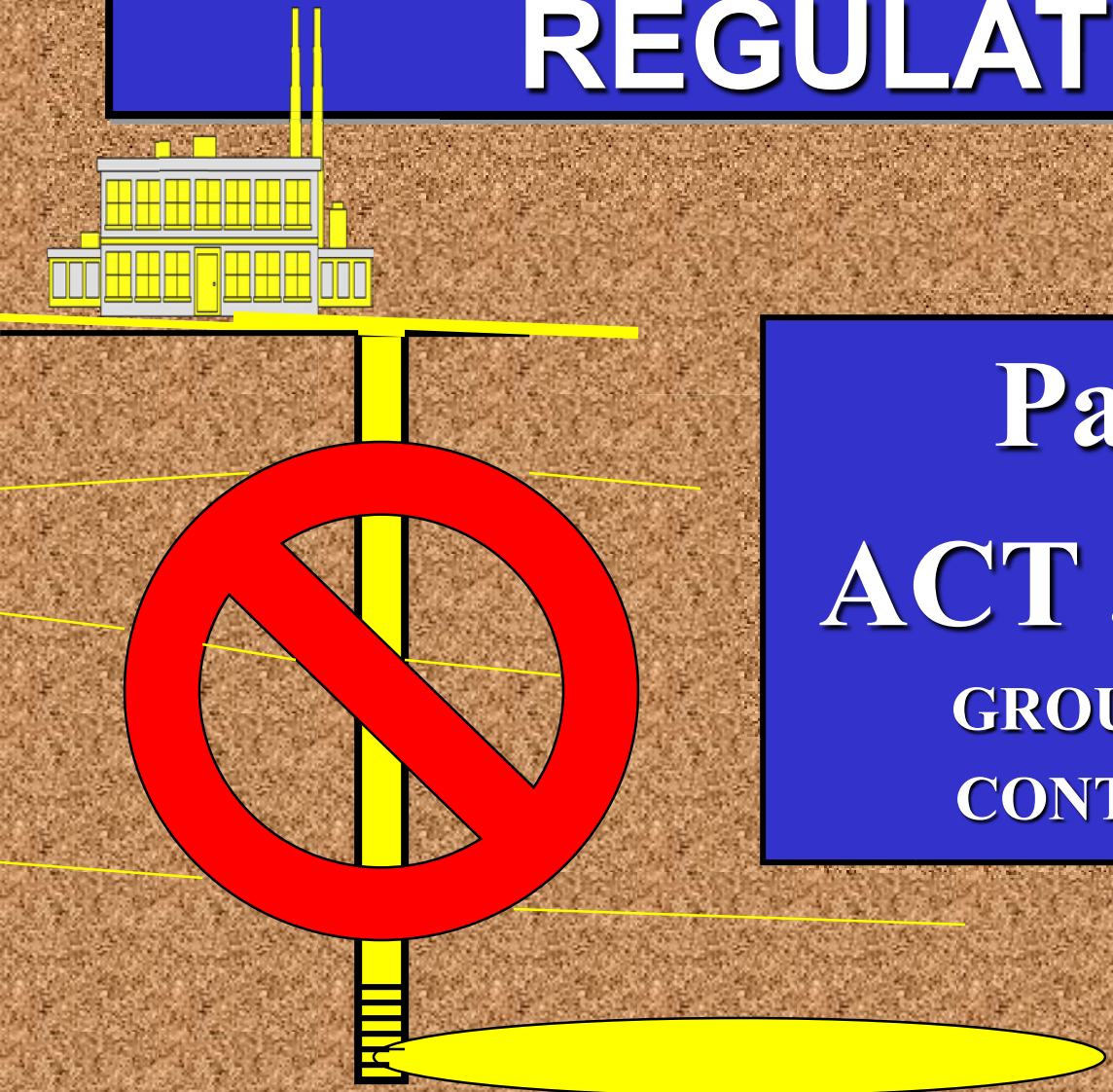
OLD STEEL WELL CASINGS CORRODE

DEFEAT NATURAL PROTECTIVE FORMATIONS

FACILITATE MIGRATION OF CONTAMINANTS



WELL ABANDONMENT REGULATIONS



Part 127

ACT 368 PA 1978

GROUNDWATER QUALITY CONTROL RULES

PLUGGING AN ABANDONED WELL

STEPS

- LOCATE ABANDONED WELL
- *REMOVAL OF OBSTRUCTIONS*
- MEASURE DEPTH & DIAMETER OF WELL
- SELECTION, CALCULATION OF VOLUME, & PLACEMENT OF PLUGGING MATERIAL
- CUT OFF CASING & RESTORE SITE
- COMPLETE ABANDONMENT RECORD

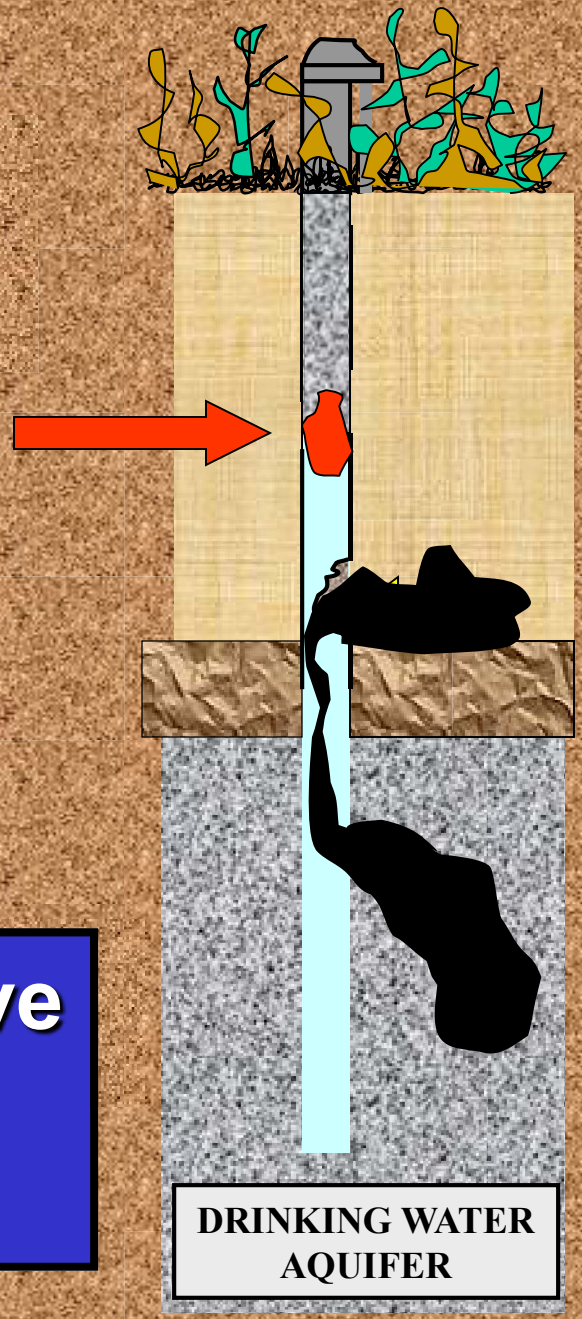
Part 127 - Act 368, P.A. 1978
Abandoned Water Well Plugging Regulations

Rule 162 (2)

A pump, a drop pipe, a packer, other equipment, debris, or obstructions shall be removed from the well, if possible, before plugging.

If obstructions are not removed from abandoned wells before plugging attempts are made, the lower portion of the well casing below the obstruction will not be effectively plugged, resulting in a open conduit for contaminant migration.

An **obstruction** can prevent grout from sealing the lower portion of the well casing.



Contaminants can still move through the unplugged portion of the well.


Is this abandoned well
ready to plug???


Preparing for obstruction removal by removing bent section of casing.

Homeowners do not have the knowledge and equipment necessary to successfully remove obstructions.

We recommend well owners hire Registered Well Drilling Contractors to perform this work.

RIG USED FOR ABANDONED WELL OBSTRUCTION REMOVAL AND PLUGGING WORK

- Hoist
- Bumping Tool
- Torches

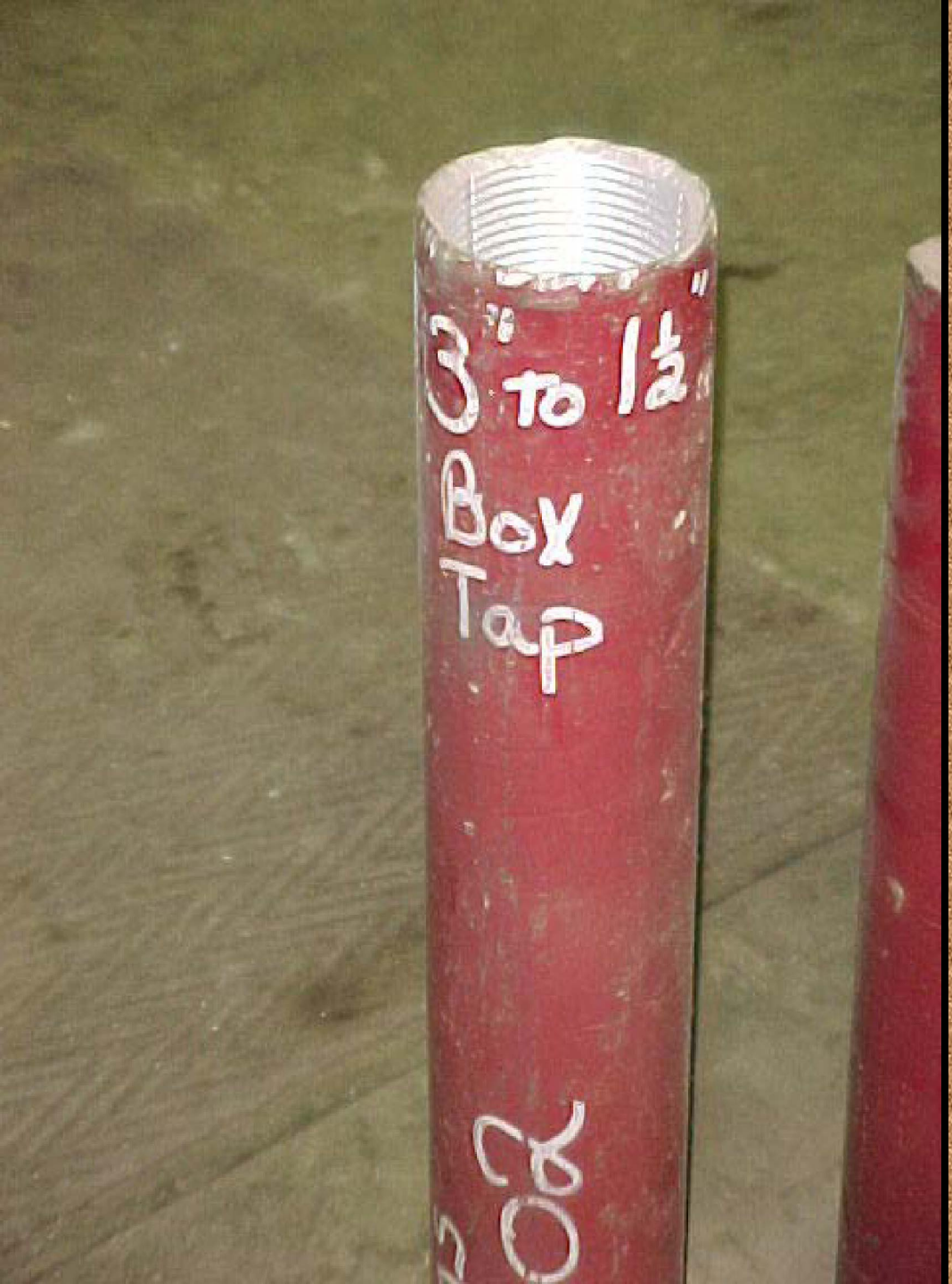

Truck Mounted Hoist
BUMPING TOOL (HAMMER)

Heavy drive weight used to loosen stuck parts.

The most commonly used “fishing” tool. TAPERED TAP


Tapered tap
Bremer check


Tapered Taps
and
Box Taps



Solid Box Tap (the opposite of a tapered tap).

Goes “over” the fish.

Tapered internally as indicated on markings.

Not mechanically releasable.

Reusable Overshot

Used for removing obstructions from 4” steel casings.

Variable size grapples used for various size “fish.”

Grapple for overshot fishing tool

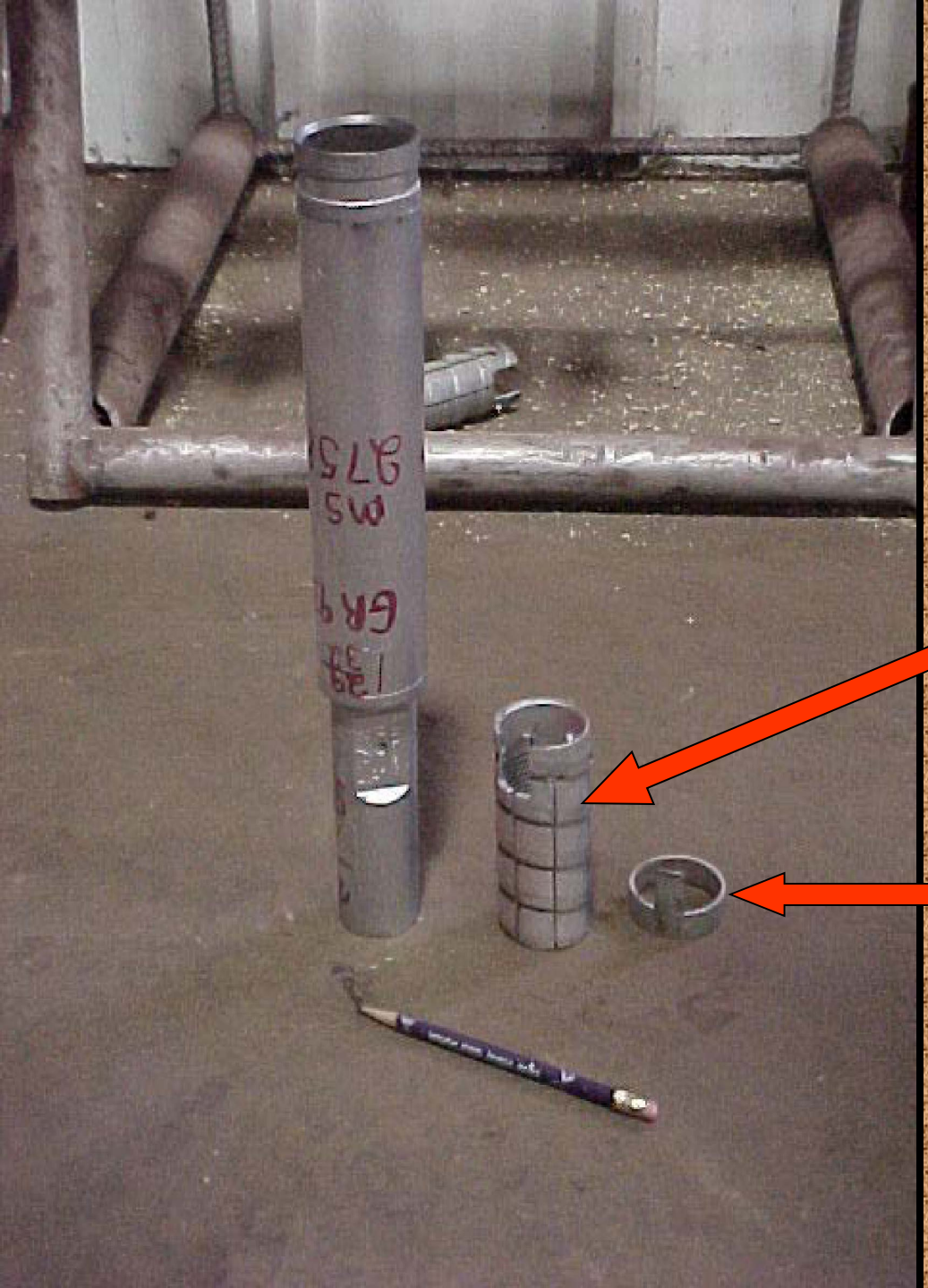
When renting these tools, return tool with fish still attached to avoid damaging grapple.


GR37590
ms
36805

Series 70
Shortcatch
ms
3118
36805


Grapple
Key


Cut lips on Box Tap
5"
O.D.



Overshot for 2 inch well casing.

Grapple

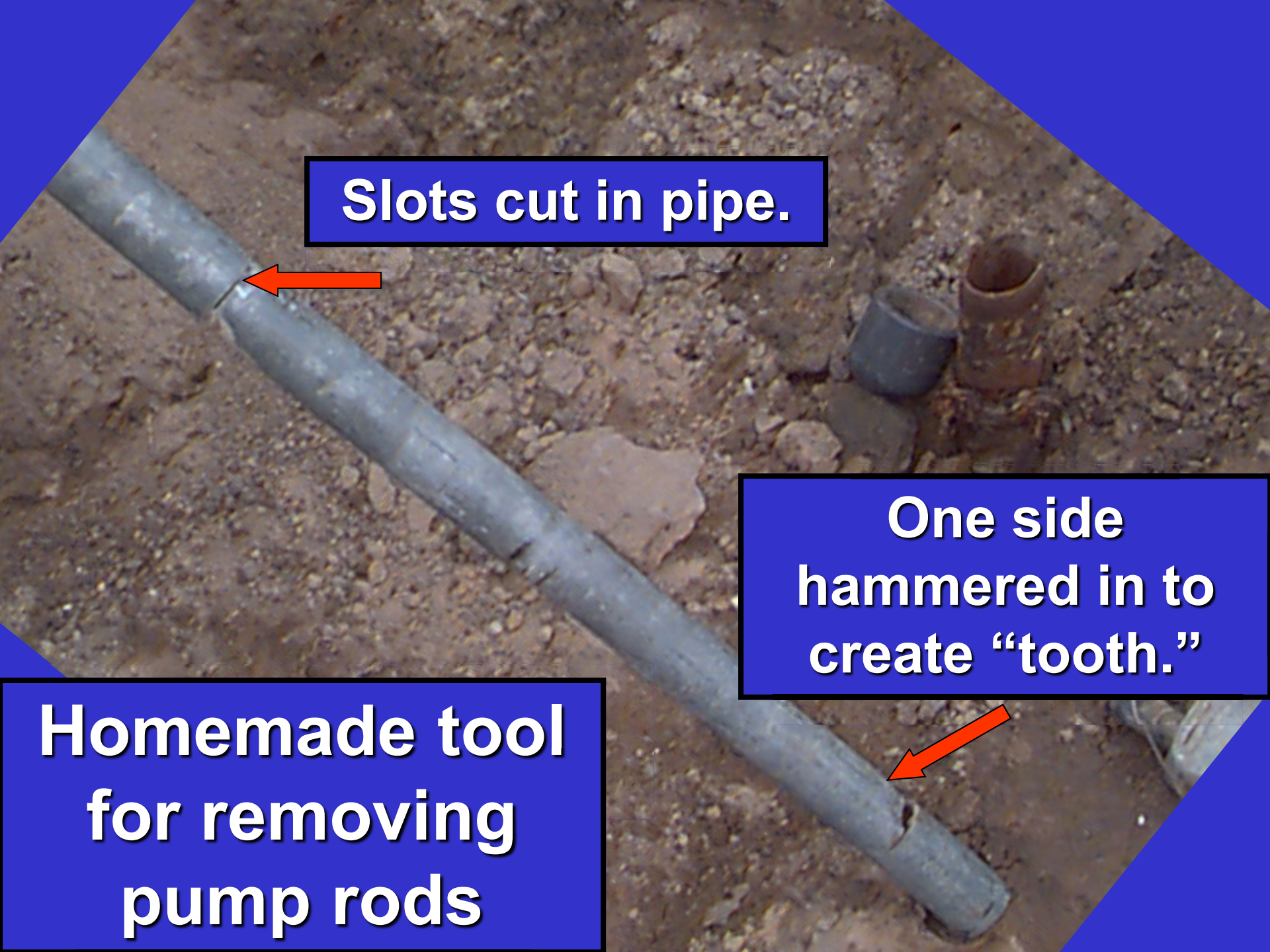
Key

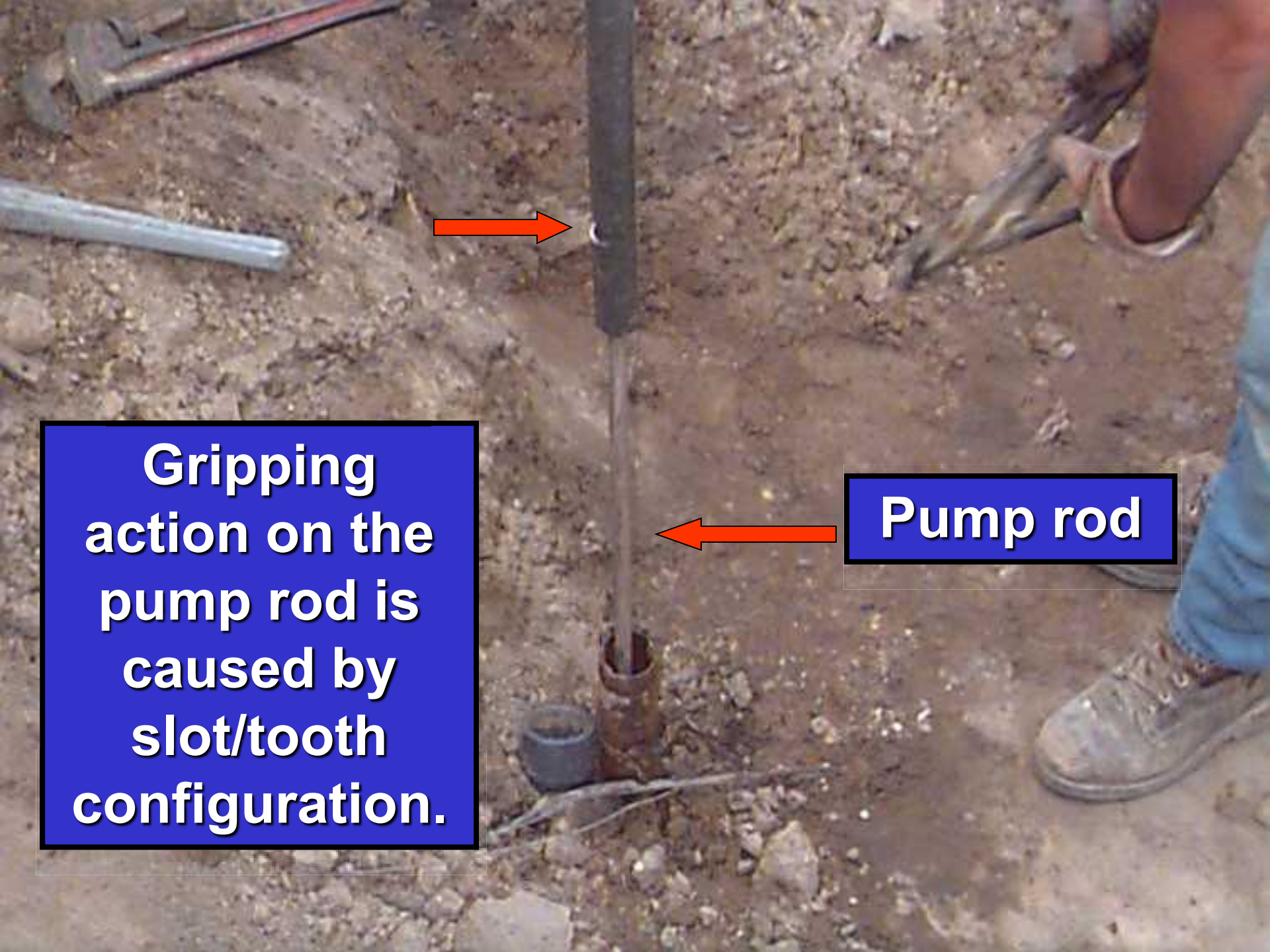
Internal Spear

Used for grabbing the inside surface of a drop pipe or casing sleeve.

May be mechanically disengaged.


Magnet


Slots cut in pipe.
One side hammered in to create “tooth.”
Homemade tool for removing pump rods


Gripping action on the pump rod is caused by slot/tooth configuration.
Pump rod


Carbide Tips
Junk Mills

2 inch “Junk Mill”

Crushed carbide-faced cutting teeth.

DEEP WELL JET ASSEMBLY REMOVED

- INITIALLY STUCK
- FREED-UP WITH BACKHOE

Encrustation causes resistance and makes for a rough pull.


In comparison to other types of pumping apparatus, Submersible Pumps are “easy-to-remove”


Hard-to-pull
parts

Capacitor potentially contained PCB Oil

Older Pre-1980's 2-Wire Submersible Pump

TAKE PRECAUTIONS WHEN DEALING WITH Pre-1980's 2-WIRE SUBMERSIBLE PUMPS.

THIS UNPLUGGED ABANDONED WELL WAS FILLED WITH SEDIMENT AND DEBRIS.

WELL WAS IN A FLOODED LOCATION. CONTRACTOR DECIDED TO AIR LIFT DEBRIS FROM THE WELL.

BLOWING OBSTRUCTING SOIL & DEBRIS
OUT OF THE WELL


DEBRIS REMOVED FROM THE WELL.
FRACTURED ROCK AREA.
WASHING FRACTURES BEFORE FINAL PLUGGING.


What if an abandoned well has an annulus around the well casing?

Where an annulus is present, it must be grouted too. In some cases, a tremie pipe may be placed in the annulus and slurry grout pumped in to fill the void area. In other more severe cases, the well casing may have to be removed to properly seal the well. Over-drilling or otherwise pulling the casing may be required.

Pulling the conductor pipe after having placed grout in the bore hole. Obstructed well casing was over-drilled & removed.

Hydraulic Pressure "Inside" Casing Cutter

Will cut ½ inch steel casing.

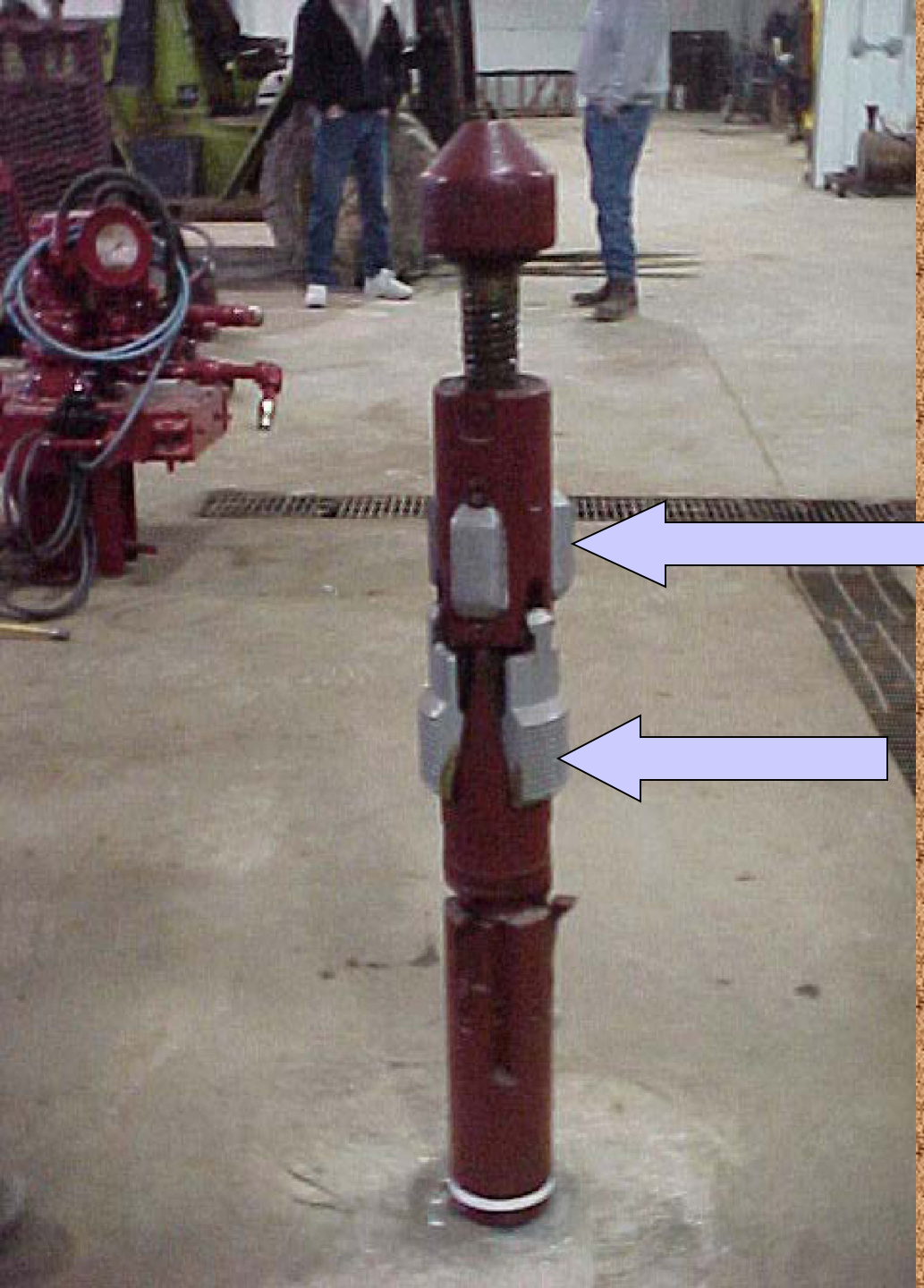
Crushed carbide "knives"


Inside Casing
Cutter
“Spear Grapple”

Mechanical Casing Cutter

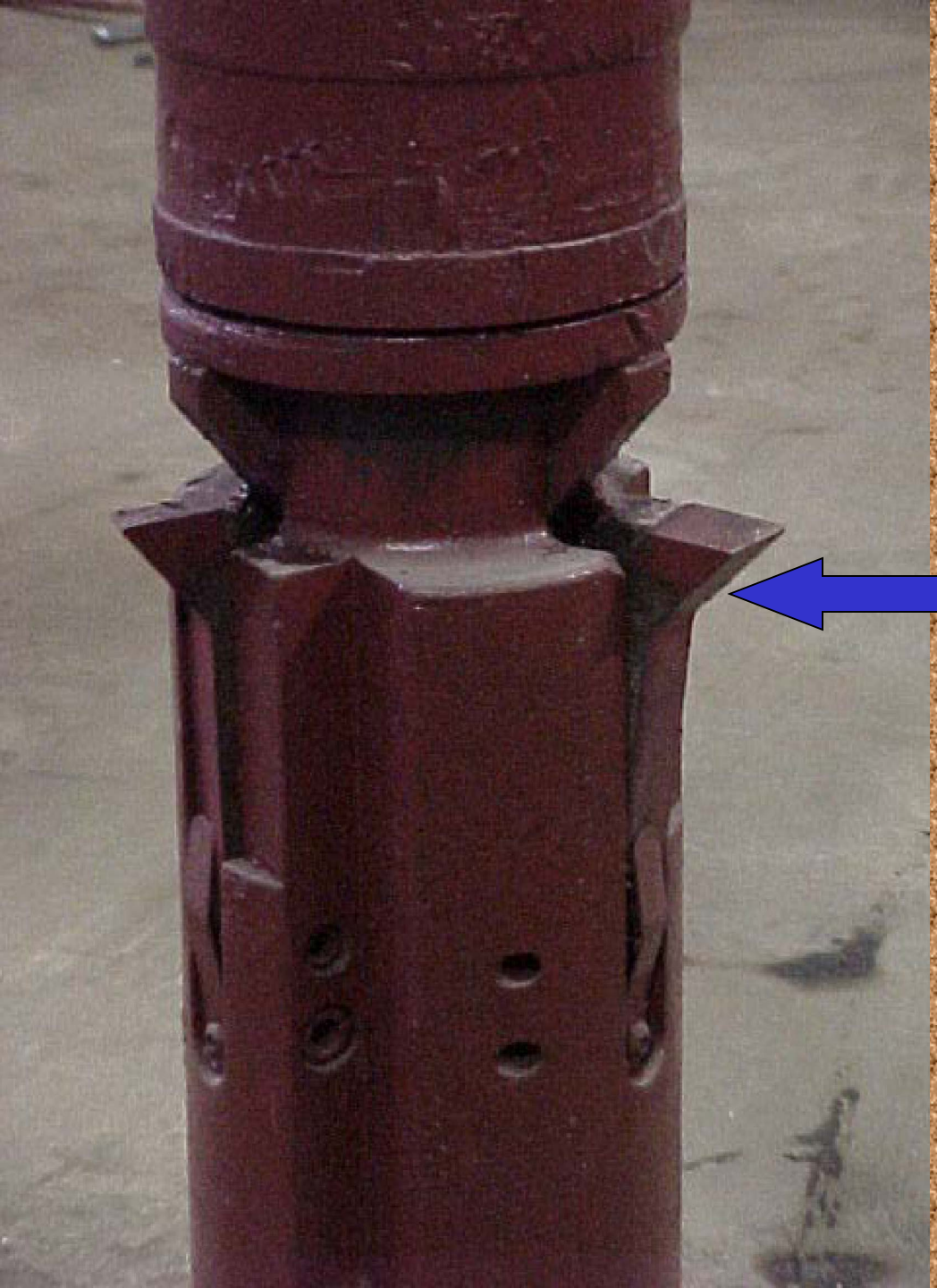
For removing sections of well casing anywhere along its length.

Once tool is in place at desired depth, drill string is rotated to set slips in place against casing wall.



Spring-loaded drag blocks

Turn clockwise to set slip dyes.



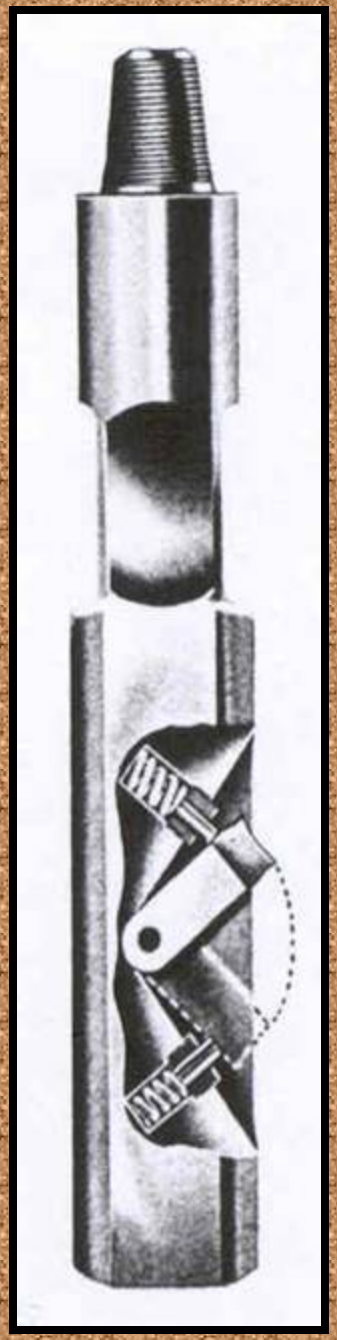
Cutter Knives Deployed


Casing Ripper
Used on Cable Tool Rig


Cuts the threaded area between the two well casing sections.

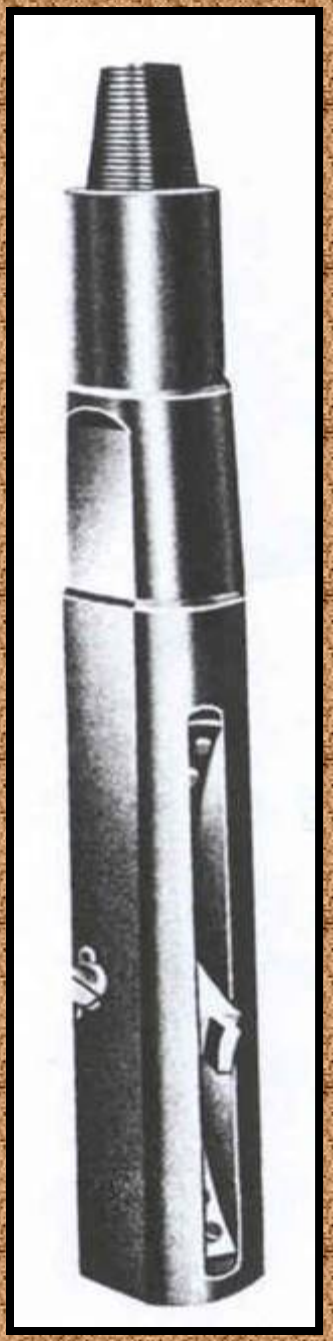
Flush Joint Wash Pipes and Outside (external) Casing Cutters.


Outside Casing Cutter



Perforating Tool

(used on cable tool rig)



Casing Perforator
(used on rotary rig)

Cutter Wheel

Will cut 1” x 1/10” slots in 5” thick steel casing

DIRECT POURING OF BENTONITE CHIPS CAN RESULT IN FINES CAUSING BRIDGING…

SLOW POURING FROM THE BAG IS OFTEN INEFFECTIVE.

UNSCREENED BENTONITE CHIPS BRIDGED IN THIS 2” WELL…

BREAKING THE BRIDGE CAN BE DIFFICULT.


PLACING PRE-SCREENED BENTONITE CHIPS BY HAND INTO 2” WELL CASING.