

FIGURE 3
FILED CUTTING EDGE

Cut a slit in one side of the sharpened end of the pipe (see Figure 2).

Source:

John Brelsford, VITA Volunteer, New Holland, Pennsylvania

Driven Wells

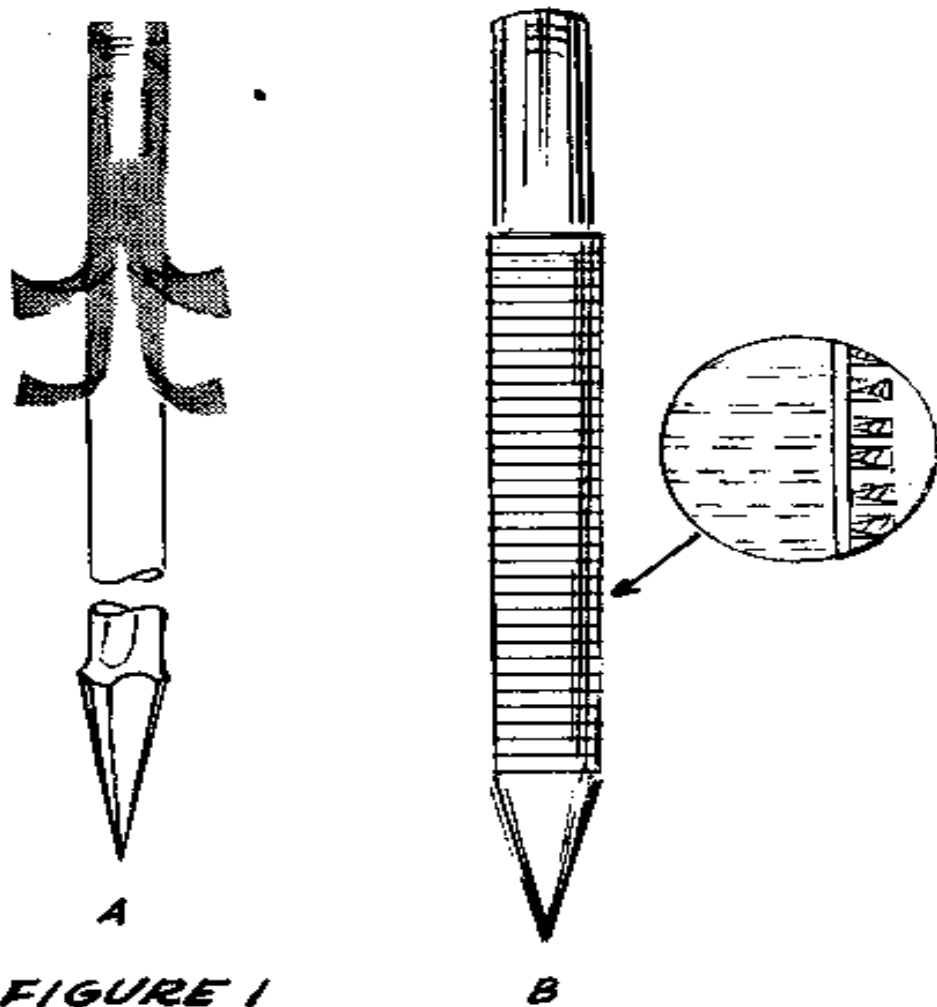
A pointed strainer called a well point, properly used, can quickly and cheaply drive a sanitary well, usually less than 7.6 meters (25') deep. In soils where the

driven well is suitable, it is often the cheapest and fastest way to drill a sanitary well. In heavy soils, particularly clay, drilling with an earth auger is faster than driving with a well point.

Tools and Materials

Well point and driving cap (see Figure 1):

fig1x50.gif (486x486)

**FIGURE 1**

usually obtainable through mail order houses
from the United States and elsewhere

Pipe: 3cm (1") in diameter

Heavy hammer and wrenches

Pipe compound

Special pipe couplings and driving arrangements
are desirable but not necessary

Driven wells are highly successful in coarse sand where there are not too many rocks and the water table is within 7 meters (23') of the surface. They are usually used as shallow wells where the pump cylinder is at ground level. If conditions for driving are very good, 10cm (4") diameter points and casings that can accept the cylinder of a deep well can be driven to depths of 10 - 15 meters (33' to 49'). (Note that suction pumps generally cannot raise water beyond 10 meters.)

The most common types of well points are:

- o a pipe with holes covered by a screen and a brass jacket with holes. For general use, a #10 slot or 60 mesh is recommended. Fine sand requires a finer screen, perhaps a #6 slot or 90 mesh;

- o a slotted steel pipe with no covering screen, which allows more water to enter but is less rugged.

Before starting to drive the point, make a hole at the site with hand tools. The hole should be plumb and slightly larger in diameter than the well point.

The joints of the drive pipe must be carefully made to prevent thread breakage and assure airtight operation. Clean and oil the threads carefully and use joint compound and special drive couplings when available. To ensure that joints stay tight, give the pipe a fraction of a turn after each blow, until the top joint is

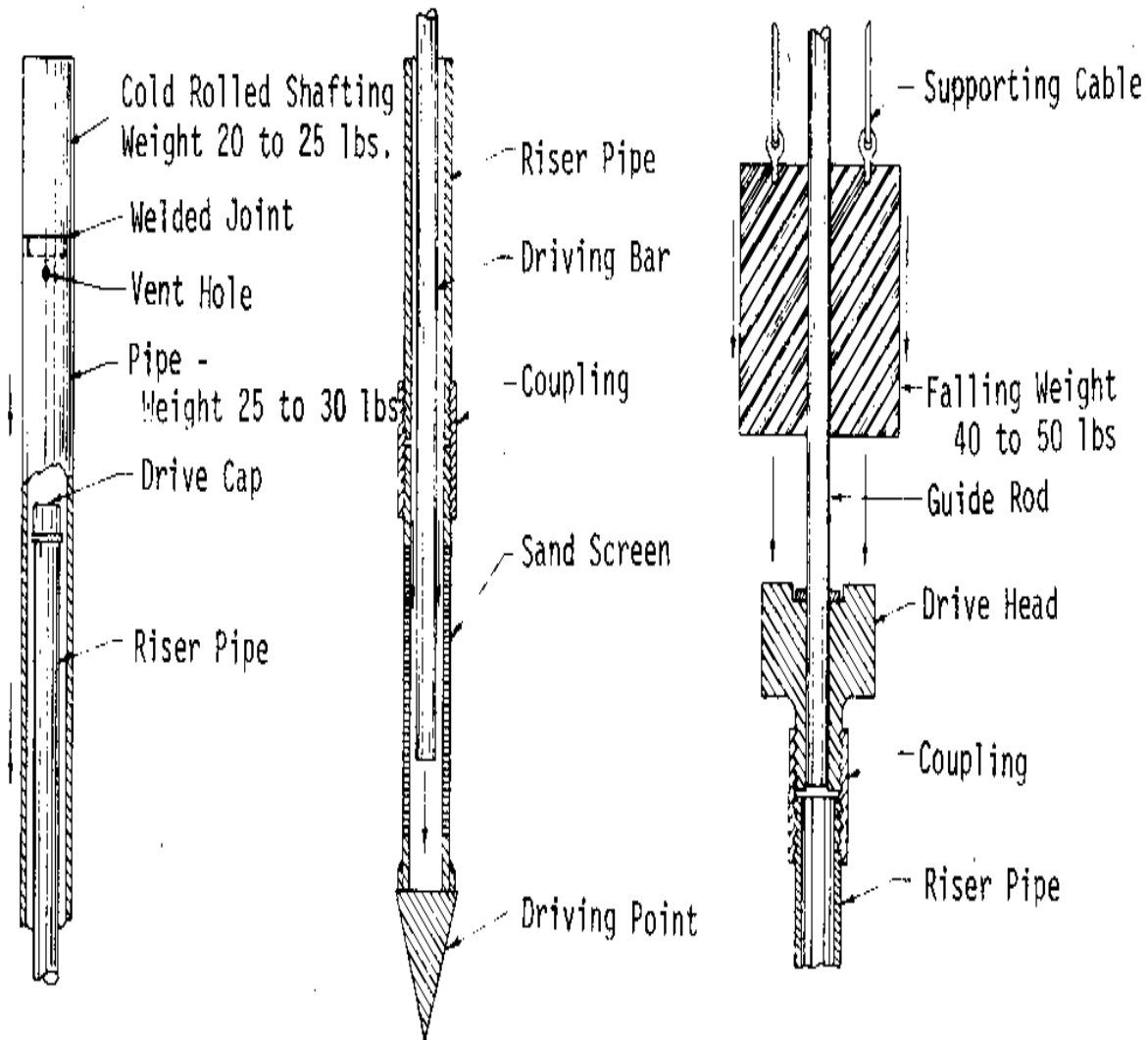
permanently set. Do not twist the whole string and do not twist and pound at the same time. The latter may help get past stones, but soon will break the threads

and make leaky joints.

Be sure the drive cap is tight and butted against the end of the pipe (see Figure 2).

fig2x51.gif (600x600)

FIGURE 2



check with a plumb bob to see that the pipe is vertical. Test it occasionally and keep it straight by pushing on the pipe while driving. Hit the drive cap squarely each time or you may damage the equipment.

Several techniques can help avoid damage to the pipe. The best way is to drive with a steel bar that is dropped inside the pipe and strikes against the inside of the steel well point. It is retrieved with a cable of rope. Once water enters the well, this method does not work.

Another way is to use a driver pipe, which makes sure that the drive cap is hit squarely. A guide rod can be mounted on top of the pipe and weight dropped over it, or the pipe itself can be used to guide a falling weight that strikes a special drive clamp.

The table in Figure 3 will help identify the formations being penetrated.
Experience

fig3x52.gif (600x600)

Type of Formation	Driving Conditions	Rate of Descent	Sound of Blow	Rebound	Resistance to Rotation
Soft moist clay	Easy driving	Rapid	Dull	None	Slight but continuous
Tough hardened clay	Difficult driving	Slow but steady	None	Frequent rebounding	Considerable
Fine sand	Difficult driving	Varied	None	Frequent rebounding	Slight
Coarse sand	Easy driving (especially when saturated with water).	Unsteady irregular penetration for successive blows.	Dull	None	Rotation is easy and accompanied by a gritty sound
Gravel	Easy driving	Unsteady irregular penetration for successive blows.	Dull	None	Rotation is irregular and accompanied by a gritty sound
Boulder and rock	Almost impossible	Little or none	Loud	Sometimes of both hammer and pipe	Dependent on type of formation previously passed through by pipe

*From: Wells, TM5-297/AFM 85-23, 1957
Army Technical Manual, p.24.*

FIGURE 3

is needed, but this may help you to understand what is happening. When you think that the water-bearing layer has been reached, stop driving and attach a handpump to try the well.

Usually, easier driving shows that the water-bearing level has been reached, especially in coarse sand. If the amount of water pumped is not enough, try driving a meter or so (a few feet) more. If the flow decreases, pull the point back until the point of greatest flow is found. The point can be raised by using a lever arrangement like a fence-post jack, or, if a drive-monkey is used, by pounding the pipe back up.

Sometimes sand and silt plug up the point and the well must be "developed" to clear this out and improve the flow. First try hard, continuous pumping at a rate faster than normal. Mud and fine sand will come up with the water, but this should clear in about an hour. It may help to allow the water in the pipe to drop back down, reversing the flow periodically. With most pitcher pumps this is easily accomplished by lifting the handle very high; this opens the check valve, allowing air to enter, and the water rushes back down the well.

If this does not clear up the flow, there may be silt inside the point. This can be removed by putting a 19mm (3/4") pipe into the well and pumping on it. Either use the pitcher pump or quickly and repeatedly raise and lower the 19mm (3/4") pipe. By holding your thumb over the top of the pipe on the upstroke, a jet of muddy water will result on each downstroke. After getting most of the material out, return to direct pumping. Clean the sand from the valve and cylinder of the pump after developing the well. If you have chosen too fine a screen, it may not

be possible to develop the well successfully. A properly chosen screen allows the fine material to be pumped out, leaving a bed of coarse gravel and sand that provides a highly porous and permeable water-gathering area.

The final step is to fill in the starting borehole with puddle clay or, if clay is not available, with well-tamped earth. Make a solid, water-proof pump platform (concrete is best) and provide a place for spilled water to drain away.

Source:

Wagner, E.G. and Lanoix, J.N. Water Supply for Rural Areas and Small Communities.

Geneva: World Health Organization, 1959.

DUG WELLS <see figure 1>

fig1x54.gif (600x600)