

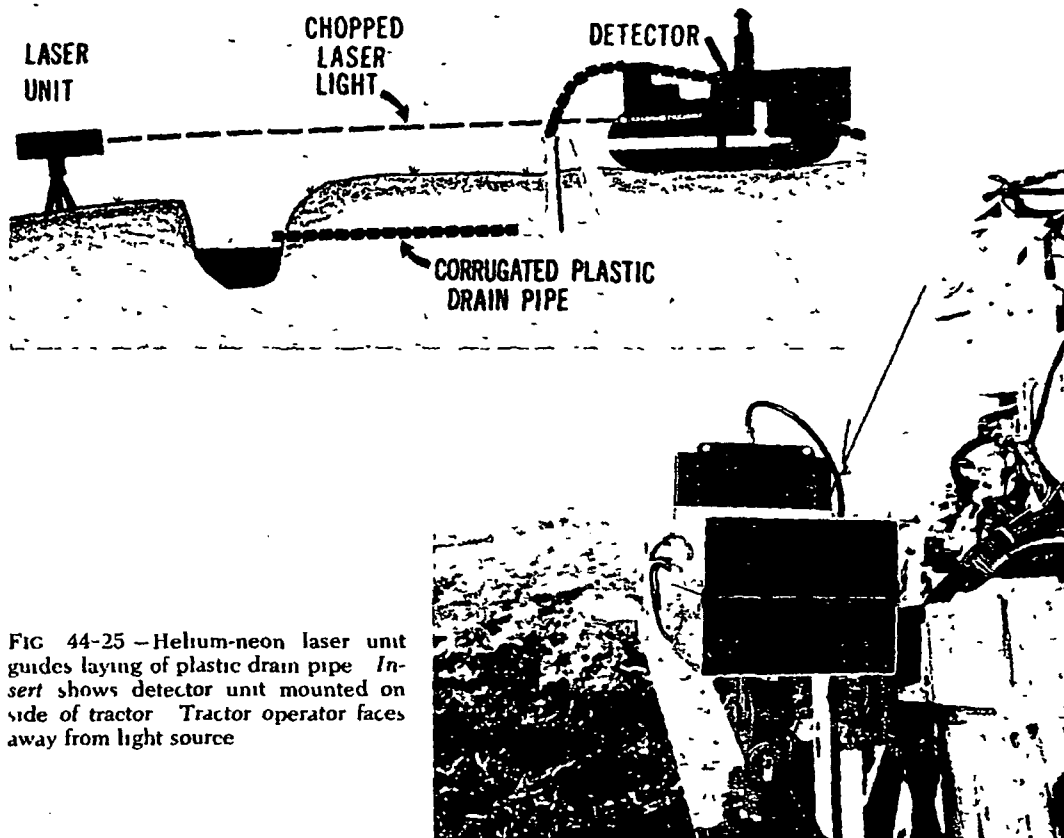


FIG 44-25 — Helium-neon laser unit guides laying of plastic drain pipe. Insert shows detector unit mounted on side of tractor. Tractor operator faces away from light source.

as continuous wave (cw). Peak power in laser beams achieved by continuous wave is lower than that which can be achieved in solid state pulse lasers.

- **THE INJECTION LASER** uses a tiny semiconductor crystal which has a desirable lattice structure of its atoms. A very small quantity of light of a desired frequency will stimulate the recombination of an electron which has been excited. This will give off a laser. Injection lasers can approach power levels that could be dangerous.

The laser beam travels in straight lines and does not spread out as ordinary light does. The energy content of the laser is therefore confined to a small diameter. A few feet from

the output end of an argon gas laser generating 18 watts of continuous wave, the power is 2000 times that of the sun. The output from a 20 milliwatt continuous wave, helium-neon laser which emits a wavelength of 6328 Ångstroms (a bright red light) at a few feet would not be felt on the surface of the skin. At an output of 125 milliwatts there would be a warm feeling on the exposed skin. Exposure to 150 milliwatts could result in third degree burns.

If the 20 milliwatt is in a beam diameter of one centimeter, it is an inconsequential amount, but if the beam is focused to an area of one square millimeter, the power density would then be 2 watts/sq cm. This would be enough to present a serious potential hazard.