

PRINCIPLES OF GUARDING

where a moving part crosses the fixed part of a machine is illustrated by the tables of a planing mill, the side of a shaper, spot welders, and clamping fixtures.

In at least two types of machines, the reciprocating motion is especially dangerous—the guillotine and the shear—where a knife moves up and down past a fixed knife (Fig. 22-3).

Some mechanisms, a cam gear for instance, use a combination sliding and turning movement. Others use an oscillating movement as in a pendulum. These mechanisms have their special dangers, and often the compound motions are more dangerous than the simple ones from which they were developed.

Squeezing action is found in toggle presses, press brakes, and hydraulic presses.

Types of guards

To eliminate the dangers involved in machine operation, either guards may be built and installed over the hazardous areas or

the equipment may be redesigned to have no exposed dangerous parts.

The modern lathe is a good example of machinery made safe through improved design. Its motor drive and gear box are enclosed so that line shafts, pulleys, and belts are dispensed with. The modern power press, in which all the working parts with the exception of the slide are enclosed, is another good example.

Types of guards which are used to make machinery safe include the fixed guard, the interlocking guard, and the automatic guard.

The *fixed guard* is considered preferable to all other types and should be used in every case unless it has been definitely determined that this type is not at all practicable. The fixed guard at all times prevents access to the dangerous parts of the machine.

Fixed guards may be adjustable to accommodate different sets of tools or various kinds of work. Once adjusted, they should remain "fixed," and there should be

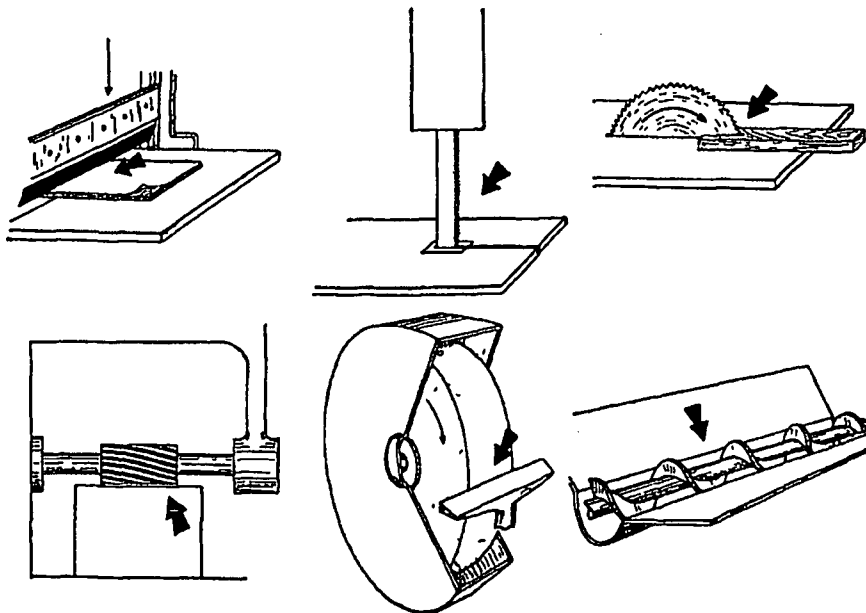


Fig. 22-3. Protection against all variations of these common cutting and shearing mechanisms should be provided.