

released by depression of the treadle. The impact of a board drop hammer cannot be varied while the hammer is in operation.

A steam- or air-lift gravity drop hammer is controlled by a valve which admits steam or air under the piston into the cylinder in the head of the hammer to raise the ram and the die. At the top point, the air or steam is exhausted and has no effect upon the hammer blow, which is controlled entirely by the weight of the freely falling ram and die. Like the board drop hammer, the steam- or air-lift hammer is operated by treadles or pedals, levers, or air valves.

The height to which the ram is raised and consequently the impact can be varied during the operation of an air- or steam-lift hammer.

A third type of gravity drop hammer has the ram suspended by ropes or belts lifted by cranes, by a drum on which the rope or belt is wound, or by similar means.

The falling weight of the ram assembly and upper die of gravity drop hammers may range from 400 to 7500 pounds.

Steam hammers

Steam hammers are also classified as drop hammers. Most steam hammers are double-acting and use steam pressure (or air pressure) through the medium of a piston and cylinder to raise the ram and the die and to assist in striking the impact blow.

Since steam or air power is used in addition to the weight of the falling ram and die, the steam hammer will strike a heavier blow than will a gravity drop hammer using an equivalent falling weight.

The falling weight of the ram assembly and upper die of double-acting steam hammers ranges from 1000 to about 50,000 pounds. They commonly produce forgings ranging from a few ounces to above 500 pounds, and sometimes up to 2000 pounds.

Steam and air operated hammers are manufactured with many built-in safety features. Some of the most outstanding are:

- 1 Hammers are designed so that the distance between the floor and the die seat is approximately 36 in.
- 2 Safety latches prevent the ram from dropping when a job is being set up or when work is being done on the die. However,

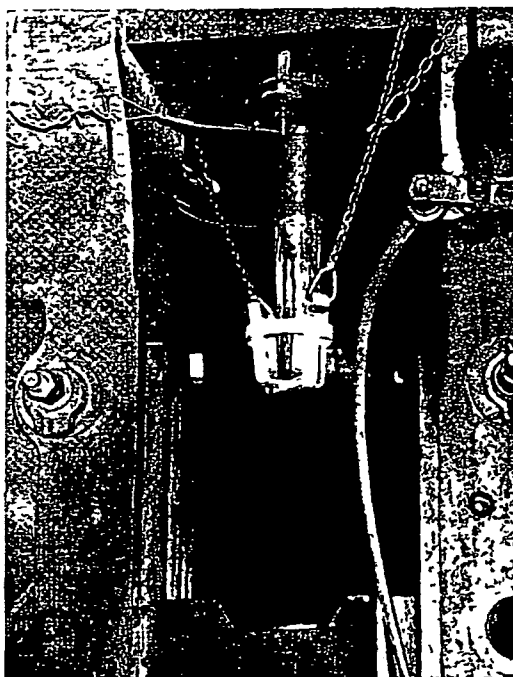


FIG 28-15 — Safety basket, made of 2 by ½ in welded steel, holds the piston rod of a forging hammer when the steam is shut off for cleaning ram bore. The ends of the bars are bent around the chain eyes.

Courtesy Tractor Works, International Harvester Co.

for complete protection, the steam or air should be shut off from the press and the ram should be blocked up.

- 3 A safety cylinder head protects against piston overtravel.
- 4 Many of the working parts are safely enclosed.
- 5 Operating levers are placed in a safe position.

Hammer hazards

For the most part, all types of forging hammers have identical hazards. The most frequent causes of injury are:

- 1 Being struck by flying drift and key fragments or by flash or slugs.
- 2 Using feeler gauges to check guide wear or the matching of dies.