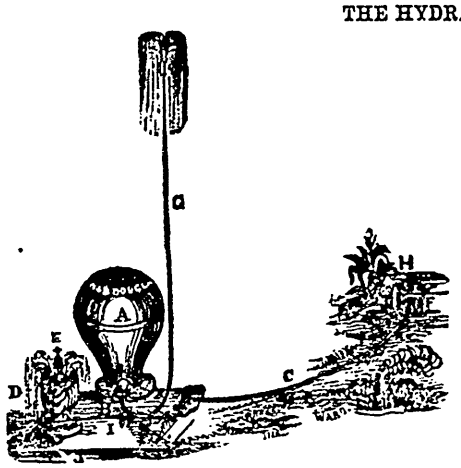
be remedied by cutting through it, either by drilling a hole at the root of each tooth, or filing towards the center of the saw until the stretched part is cut through.

Water is sometimes used to cool a saw; it also enables a saw to work in a smaller kref, thus saving power; and it also acts as a partial lubricator. It should be directed in jets on each side of the saw near the center. Its use, however, should be avoided in cold freezing weather. Allowing the saw shaft to play endwise, is one of the most effectual means of keeping the saw cool. When the timber springs against the saw, tending to heat it at the center, the end play of the shaft allows the center of the saw to yield; at the same time, the guide pins at its periphery keep it in line and the friction is therefore reduced, and liability to heat diminished in a corresponding degree.—*Scientific American.*

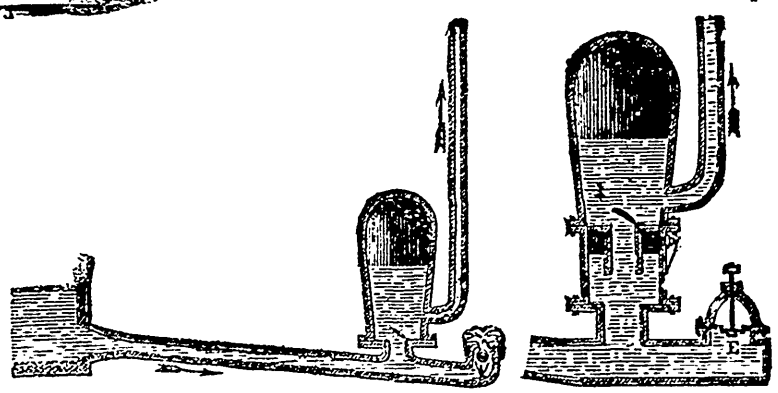
THE HYDRAULIC RAM.



The Hydraulic, or Water Ram, is a very ingenious modern invention; and as economical and useful as it is ingenious. Of course, it is necessary that there should be a running stream within a reasonable distance of the spot where the water is required to be delivered. The principle on which it acts, may be understood from the accompanying cuts and description:—

EXPLANATION.

H, is the brook, spring, or fountain: C, the drive pipe: G, the pipe which conveys a part of the water from the drive pipe to the place where wanted: A, the air chamber of the ram: E, top of brass valve:



D, water wasting through the valve, by which the power of the ram is secured. A fall of at least 18 inches is necessary: three or four feet is better. The greater the fall, the higher can the water be delivered. Ordinary rams raise 20 gallons per minute: they are made to raise 50 gallons. With a fall of five or six feet, a portion of the stream can be raised upwards of 100 feet. For the purpose of irrigation, and for conveying the indispensable element to the farm house, barn, &c., this ram is well worthy the attention of Canadian farmers who need its aid. The following explanation of the *modus operandi* is copied for the benefit of those who may be curious in such matters:—

The hydraulic ram is a simple mechanical apparatus, constructed upon philosophical principles, and is used very effectively in raising a portion of the water from a spring or running brook above the level of its fountain head. The following description, it is believed, will be easily understood. Suppose a water pipe is laid along down the course of the stream through which the water is required to pass. The lower end of the pipe is closed, and near that extremity is an orifice on the upper side which is opened and closed on the inside by a puppet valve shaped something like an inverted barrel bung. There is also another similar orifice and valve opening outward from the main pipe, and into an air vessel. Now let both valves be closed. As there is then no means of escape for the water in the pipe leading from the spring, it is brought to a state of rest. The valve opening inward is loaded, so that its gravity is greater than the pressure of the water at rest in the pipe; it consequently falls into the pipe, leaving the orifice open, through which the water immediately begins to rush with increasing velocity, until its momentum becomes such as to push up the valve to its place in the orifice. The momentum of the water suddenly stopped in its course, is such as to lift up the other valve opening outward into the air vessel, through which the water rushes, compressing the air into a smaller compass, until the re-