

A SIMPLE SAW SETTING AND GUMMING MACHINE.

The invention which forms the subject of the engraving annexed is a novel machine for setting and gumming saws, which machine has been patented by Mr. John I. Newburg, of Vicksburg, Miss.

The machine comprises a base, an upright frame carried by the base, and a plunger operated by a lever pivoted in the frame. The base is formed with a transverse groove, which receives a removable member carrying a fixed setting-die of the shape shown in Fig. 5. At one side of the fixed setting-die, the removable member is provided with an inclined plane, which is used in setting the saw-teeth. In one of the recessed sides of the plunger is a detachable, angular die co-acting with the fixed setting-die. As shown in Fig. 3, the detachable die is provided with a square portion and an inclined portion, the latter conforming with the upper side of the fixed die. The plunger is yoke-shaped; and between its forks a setting-die is carried adjustable by means of a set-screw. On the base of the machine a gage is arranged, consisting of wings carried by a bail of wire, which is held in adjusted position by a set-screw.

To insure a uniform setting of the saw-teeth, the gage is properly adjusted so that the teeth will bear against the wings mentioned. By means of its set-screw the setting-die carried in the plunger-yoke is then brought over the tooth next to that resting on the fixed die. The plunger is now forced down by means of the lever, and the two teeth mentioned are simultaneously set. The angular die on the side of the plunger co-acts with the fixed die in the base of the machine to force one tooth up; and the setting-die carried in the plunger-yoke forces the adjacent tooth down into the incline before mentioned. By reason of the arrangement and novel form of the dies shown in Figs. 3 and 5, the teeth are flattened before they are set.

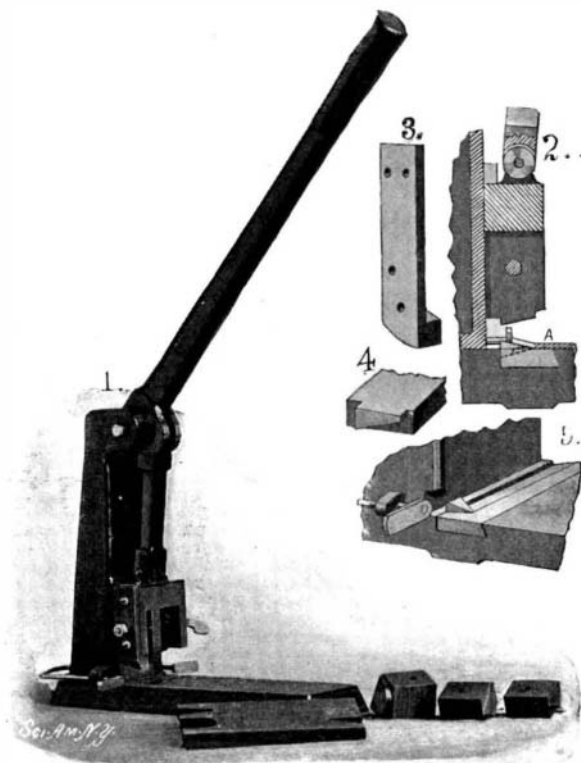
In order to use the machine as a gummer, the dies are all removed. In place of the setting-die carried in the plunger-yoke, one of three gumming-dies is employed, which gumming-die acts in conjunction with a correspondingly-formed notch in a plate placed on the base. The plate is formed with three notches, each adapted to receive a gumming-die. Of the three gumming-dies, one cuts the larger spaces of cross-cut saws; a second, the spaces of gang and band saws; and the third, the smaller spaces of cross-cut saws. Any of the dies can be placed in position in the plunger and used in conjunction with the corresponding notch in the plate to cut spaces of the proper kind. The machine is readily converted from a setter into a gummer. The construction is such that a straight saw of any size can be set or gummed without any mechanical skill whatever.

FAMOUS BASALTIC COLUMNS.

BY PROF. CHARLES FREDERICK HOLDER.

Scattered over the world are some famous basaltic columns, and among the most interesting are those which have been discovered in the extreme southeastern portion of the Yosemite National Park; a region so out of the way and inaccessible that few have visited it. Mr. Lukens, ex-Mayor of Pasadena, has succeeded in photographing the columns, reproductions of which are given in the accompanying engravings. The deposit is known as the "Devil's Post Pile," and is well worth the time and trouble necessary to make the trip. It is located on the middle fork of the San Joaquin River, in strange contrast to a rich green meadow above it. Near by lava streams can be recognized, suggesting its origin. The columns crop out in various places; in some looking like a vast honey-comb; at others resembling a gigantic pipe-organ. The finest group is called the "Devil's Post Pile," and stands directly on the bank of the river, showing a mass of magnificent columns from sixty to seventy feet in height and from eighteen inches to three feet in diameter. Some of the columns are perfectly straight; others are twisted and bent, and at one point the entire mass has been so twisted and bent that it has the appearance of flowing water. Earthquakes have played havoc with the columns; broken them off, toppled them over, so that in front of the array of piles there is a talus of broken columns resem-

bling a pile of Titanic bricks. Basaltic columns wherever found invariably arouse great interest, and their presence has given especial significance to many localities. The rock is of undoubted volcanic origin, and near the columns in the Yosemite can be seen



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the flow of ancient lava. The rock is made up of feldspar and augite or hornblende, and is usually dark green, gray, or black in color. The columnar form which it often takes has given rise to much discussion. The prisms are five or six-sided, and resemble crystals, and are so considered by many; this being denied by other authorities, while others again consider the strange prisms to be merely the result of a tendency toward crystallization. Be this as it may, the great mass in the Yosemite Valley resembles a wall of crystals growing out of the earth; yet they are undoubtedly a result in past ages of impeded

contraction, the hexagonal shape being due to the fact or law that this is the only possible result of "the combined action of contracting forces acting in all directions in one plane."

Some of the most famous basaltic columns are to be seen in Nova Scotia, at Bergen Point, N. J., and in various portions of the Rocky Mountains and the Sierra Nevadas. The Giant's Causeway, in Ireland, is noted the world over; and the Palisades of the Hudson are examples of columnar structure. Perhaps one of the most interesting examples of these singular columns is found on the small island of Staffa, in the Hebrides group, which is undoubtedly of volcanic origin. This island appears to be built up of stone piles, and in olden times it was the belief of the people who lived on the adjacent islands that the columns were made by human hands. To the casual observer it would seem that the columns had been placed regularly in position and the earth piled on top of them. This island, in all probability, is the most famous basaltic formation in the world, and is permeated in every direction with caves; the water having eaten into the interior and broken away the columns. One of the best known is the "Cave of Music." The water flows in through an opening, giving rise to sounds which are supposed to be more or less harmonious. This cave lies on the southern side of the island, extending inward in a northeast direction for about two hundred and thirty feet. The entrance is impressive, being seventy feet in height and fifty feet in width, with an architrave thirty feet high surmounting it. On the sides are perfect and beautiful columns of greenish-black color, symmetrical and regular. They range from eighteen to thirty-six feet in height, and give the appearance of a huge organ, this idea being still further carried out by the rhythmical surge of the sea which sweeps into the cave, producing a loud and truly musical sound. It is rarely that the cave can be entered, as it faces the prevailing wind, and usually a heavy sea rolls in making it impossible for boats to live; but on rare occasions visitors have made the trip and have described many beauties of structure which are not discernible from the mouth. The ceiling is particularly beautiful, the columns being so worn away that they show the scar of the hexagon alone or its shape. Around the edges a white or yellow substance, looking like lime, has exuded, filling up the crevices so that in effect there is a colossal mosaic.

The Giant's Causeway has a rival in the basaltic formation discovered a few years ago in the Orange Mountains, of New Jersey. This formation has been traced about one thousand feet along the face of the mountains, and presents a commanding front of hexagonal columns perfect in detail and ranging in height from thirty to one hundred feet. The columns are remarkable for their size, some being four feet across a single side, while the smallest range from two to two and a half feet across the sides. These gigantic columns present a most impressive front, and the contrast between them and those of the Giant's Causeway can be realized when it is known that the columns in the latter are hardly twenty feet in height and from fifteen to twenty inches across.

The Orange Mountain columns occupy what was once an ancient volcano. The molten matter was forced out through the fractures or the inclined ledges of the rock to the surface, where it has cooled into the peculiar five or six-sided shape. In almost every instance these deposits are inaccessible or difficult to approach, but the authorities in the Yosemite, it is said, propose to make a trail to this new wonder of the National Park, so that it can be easily reached, and it will soon take its place among the great attractions of this region.

In his annual report, Prof. Pickering, of Harvard College Observatory, again refers to the need of a large telescope in the Southern Hemisphere to carry on work which cannot be done in the North. It is of the highest importance to provide for special work on the extreme Southern stars, and a great telescope installed in some elevated station in the Southern Hemisphere, at Arequipa, Peru, for example, is necessary.



BASALT COLUMNS CALLED "DEVIL'S POST PILE"—YOSEMITE NATIONAL PARK



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