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Adaptation of the Hydraulic Jack to Starting Engines from their Dead Centers.

It is well known to engineers of beam engines, especially when used on shipboard, that occasionally the hanging of the engine on its centers is a source of considerable annoyance and loss of time. It is a severe strain to an engine when in such cases steam is admitted alternately above and below the piston, and it is dangerous to the men and damaging to the wheels to attempt to move the engine from its dead center by means of the wheel buckets.

The engraving exhibits the attachment of the ordinary hydraulic jack to the frame of a beam engine for the purpose of starting it from the centers. A, is a jack placed in proper position for acting on the crank when on the lower center, and B shows the location of one for actuating the crank when on the upper center. Both these jacks are pivoted to bases so that they can be swung out of the way when not in actual use, the dotted lines at A denoting the position of that jack when swung back; that at B, being represented as already in that position. The lower one is moved in a vertical and the upper in a horizontal plane.

A few strokes of the lever—seen at C on the lower jack—will suffice to move the crank far enough to give lead to the engine, and it can be operated in a moment by one man. No further explanation is required by any engineer to see the value of this application. Any further information can be obtained by addressing W. W. Vanderbilt, General Superintendent of Hulls and Machinery of the Pacific Mail Steamship Co., corner of Avenue D and 12th street, or Alfred Sims, Novelty Iron Works, 12th street, East River, New York city.

ORNAMENTING GLASS, PORCELAIN, ETC.

A method of ornamenting glass, porcelain ware, etc., with photographic pictures, has been invented by W. Grine, of Berlin, which also contains a new method of preparing negatives so that positive films may be readily printed and removed from the negative. The negative, after being fixed and toned with chloride of platinum, is dried and varnished with a glassy flux which is annealed upon the negative by heat in a common muffle. The photographic film being now protected the negative may be dipped in water, acids, and other solutions with impunity. To produce positive prints one side of the negative plate is covered with collodion, sensitized, exposed to light, fixed and toned in the usual manner. The positive film may be then detached by loosening one corner with a soft brush and floating it off in a vessel containing water and a little glycerin. Any number of films may be thus printed and floated. The film may now be floated upon the surface of the glass or porcelain which is introduced into the water vessel, a soft brush being used to spread the film nicely. The film is now covered with the glass flux, and then annealed in a muffle as before described.

By toning the film prior to annealing with different metallic salts, a variety of colors may be produced on the picture. For example, if gold color is wanted, the films are treated with chloride of gold; steel color, chloride of platinum; black, chloride of iridium; brown, chloride of palladium. If the different salts are applied to different parts of the film, the various colors will be seen combined in the picture after it is annealed, and beautiful effects may be produced. The pictures may be polished and burnished subsequent to the annealing process in the usual manner.

A Specimen of Hydrogen from Stellar Space.

The eminent chemist Graham, has made some curious experiments, by which it was proved that at high temperatures, iron would absorb several volumes of the gas to which it was exposed, and retain the same on cooling. He has now extended these experiments in a curious direction. Taking a piece of

the meteoric iron of Lenarto, and heating it in vacuo, he obtained about 2.8 volumes of hydrogen. This would prove that when last red-hot, this meteorolite was immersed in a dense atmosphere of hydrogen. A large class of the fixed stars show strong hydrogen bands, and one of the bright lines found in all nebulae indicates the same element, and the remarkable temporary star seen in May of 1866, indicated the presence of an intensely heated atmosphere of hydrogen. It

point and then instantly withdrawn. In manufacturing fluted trimmings and also for laundry and household purposes this machine will be found very convenient.

Patent pending through the Scientific American Patent Agency. Further particulars may be obtained by addressing Newman & Capron, 1,172 Broadway, New York city.

What Is Obsidian?

When Hernando Cortez invaded Mexico he was met by a warlike people who disputed every inch of his way and wielded their battle axes and two-handed swords of obsidian with as terrible effect as ever the knights of old their weapons of Damascus steel. From Dr. Feuchtwanger's "Teatise on Gems" we extract the following account of this mineral:—

Obsidian was familiarly known to the ancients, and its name is said to be derived from a Roman, who first brought it to Rome from Ethiopia. Pliny states that the Romans manufactured mirrors and gems from it; the Mexicans and Peruvians manufactured their knives, razors, and sword blades from obsidian, which appears to have served as a complete substitute for other materials with those nations, who were yet unacquainted with the use of iron for weapons and utensils of various kinds. Baron Humboldt says that Cortez mentioned, in his letter to the Emperor Charles V., having seen razors of obsidian at Tenochtitlan; and the above naturalist likewise discovered, on the Sierra de las Nabajaz, in New Spain, the old shaft that was used for raising the rough obsidian, with relics of the tools and half-finished utensils.

The inhabitants of Quito manufactured magnificent mirrors from obsidian, and those of the Azores and Ascension islands,

and Guiana, used splinters of obsidian as points for their lances, razors, etc.

Specimens of arrows and other articles, such as octangular wedges, were presented a few years ago to the New York Lyceum of Natural History, being relics from the ruins of Palenque. In the collection of Columbia College are some razors, or sacrificial knives, the gift of the Hon. J. R. Poinsett.

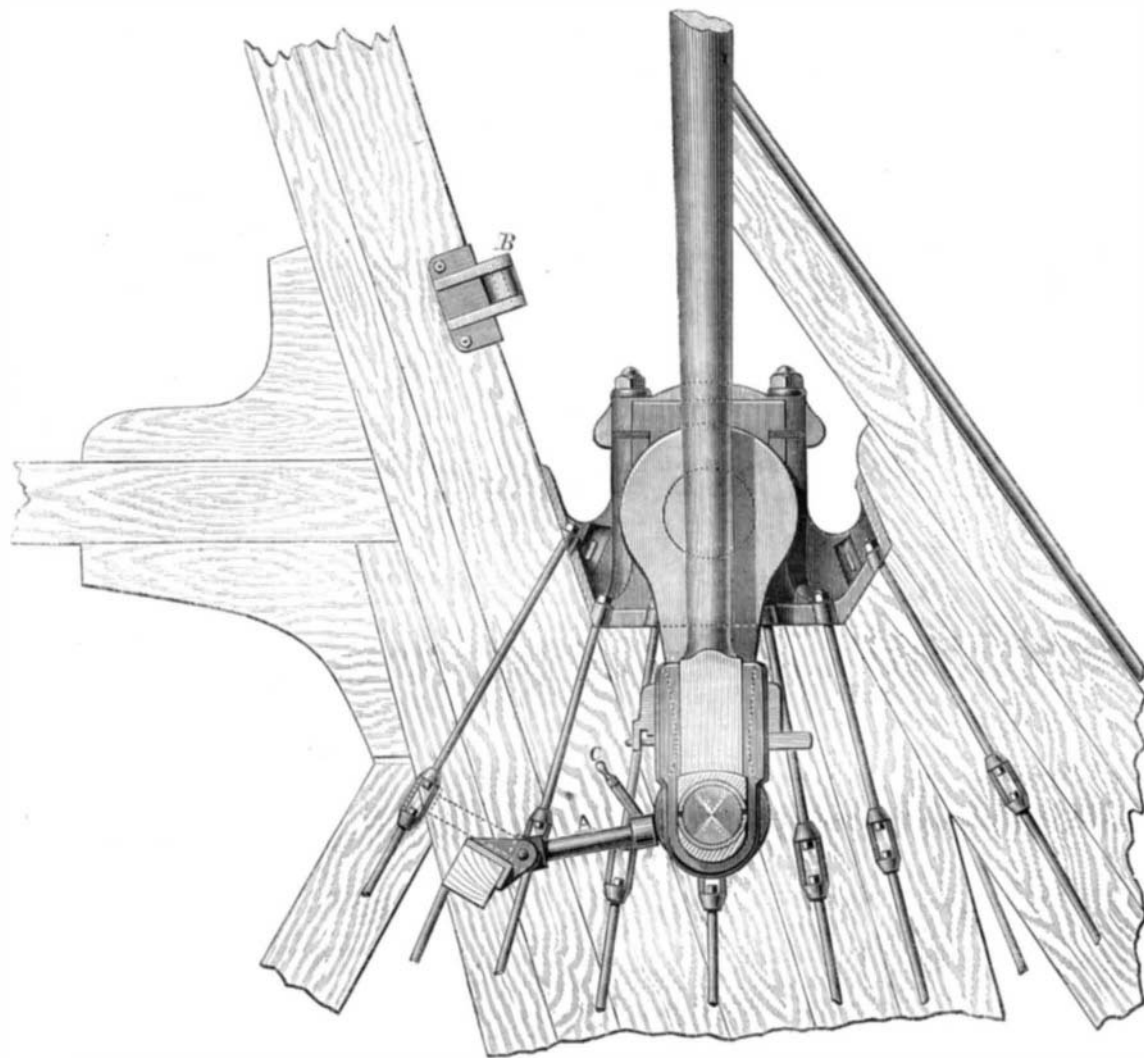
Obsidian occurs massive, in roundish or obtuse lumps, balls, and grains; has a conchoidal fracture; is semi-transparent and translucent on the edges; it has a strong vitreous, and sometimes even metallic luster; its colors are either pure black, grayish, brownish, greenish-black, yellow, blue, or white, but seldom red; it sometimes displays a peculiar greenish-yellow shine, when it is called the iridescent obsidian; there is rarely more than one color in the same specimen with stripes and specks. Obsidian scratches white glass indifferently, but is scratched by topaz; its streak-powder is white; it has a specific gravity of 2.34 to 2.39. Obsidian is sometimes magnetic, so that small pieces show their magnetic poles. Before the blowpipe, the black variety is fusible with much difficulty; and even at a white heat it does not melt into a solid glass; but the gray and brown variety (marekanite) swells readily into a spongy mass.

Obsidian consists of siliceous alumina, with a little potassa, soda, and oxide of iron.

The names, Iceland agate, lava, black-glass lava, volcanic lava, are all synonymous, and the mineral called bottle-stone, in round grains of the size of a pea, is nothing but a green obsidian.

Obsidian sometimes forms the cement of whole mountain chains, often forms deposits in the trachyte and the streams at the foot of some volcano; also among the volcanic ejections, and occurs in loose lumps in the sand of rivers, and at the foot of mountains. It is found in Iceland, Teneriffe, the Lipari Islands, Peru, Mexico, Sicily, Hungary, Asiatic Russia, the Ascension Islands, and on all the volcanoes of former and present times.

In the New York Lyceum of Natural History are several interesting specimens, presented by Don Corrae, of Tabasco, from the ruins of the city of Palenque, such as concave or triangular wedges, and other masses of obsidian, from various localities.

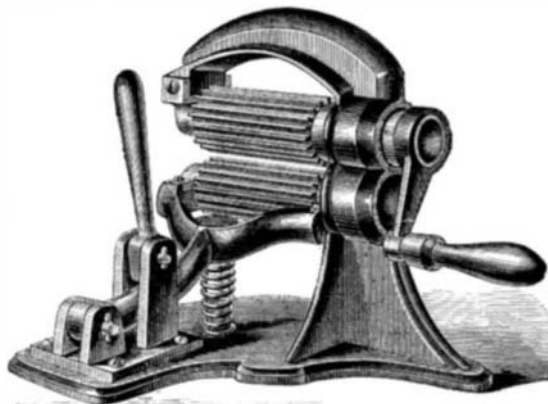


VANDERBILT AND SIMS' APPARATUS FOR STARTING ENGINES.

would thus seem that the gas obtained from this piece of meteoric iron, by Professor Graham, is a literal sample of that which, among stellar bodies, is recognized by other properties, through the aid of the spectroscope.—*Franklin Journal*.

MACHINE FOR FLUTING TRIMMINGS, ETC.

The little machine seen in the engraving is a valuable improvement on the common fluting machine, in that the material can be withdrawn at any stage of the operation without running the ruffle entirely through or reversing the motion of the fluting rollers.



The rollers are of brass or other non-conducting metal, hollow, to allow of the introduction of heaters of iron, copper, soapstone, or other material, and mounted in a suitable frame, as seen, one end of which is open to allow of the material being slipped off the end of the roller or introduced at that point. The upper roller turns in fixed bearings and is rotated by a crank. The under roller is suspended on a forked support, pivoted at its rear end, and sustained in position by a powerful spiral spring. It may be depressed by means of a cam lever working in a stand, which, when raised, as in the engraving, separates the two rollers. Thus, a ruffle or any article it is designed to flute, may be fluted to any particular