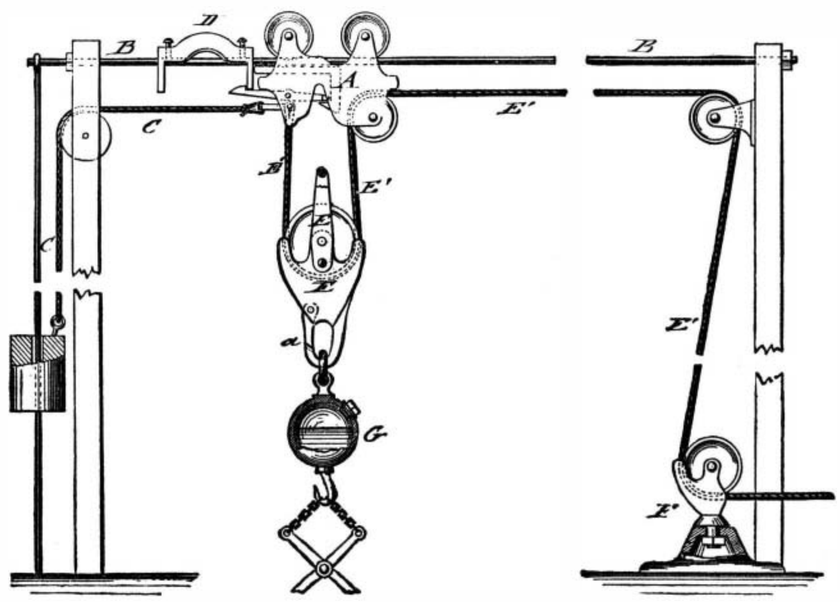
IMPROVED HAY ELEVATOR AND CARRIER.

Messrs. M. C. & A. H. Smith, of Starkville, N. Y., have recently (March 7, 1876) invented a hay elevator, which is operated by attaching one end of a lifting rope to the carriage, passing it then under the load-carrying pulley, thence over a guide pulley on the carriage, as well as one on the frame, and finally under a grooved pulley journaled in a swiveled frame A variable balance weight is used with the load-carrying pulley; and the latter is hung to the carriage, raised and lowered by a swivel pulley, and moved forward to the contact stop by a cord and weight applied to the carriage. An adjustably weighted ball hung to the fork-carrying pulley balances the length of rope by which the load is raised and lowered.

In the engraving, A is a movable carriage, running by top wheels on a strong track rod, B. The carriage, A, is moved along the supporting rod by a rope, C, that passes over a pulley, and is supported sufficiently to produce the ready motion of the carriage in one direction, until the same comes in contact with a stop frame, D, that may be adjusted by clamp screws to any point along the rod, B, so as to admit the taking up of the load at any suitable point on the rod, B.

The carriage is so constructed that the arrow or bail of a load-carrying pulley, E, is locked thereto after being elevated, and released by the contact with the stop frame. The load-carrying pulley, E, is hung to the carriage by a rope, E′, which is applied to a fixed point of the carriage, A, and passes over a pulley of the same to the end of the supporting rod, then over a second pulley to the ground, and over a swivel pulley, F, to the draft bar of the horse or other power. The swivel pulley has the advantage of adjusting itself readily to the direction of strain without clamping or wedging the hoisting and lowering rope, E′. A bottom hook of weight, G, carries the hay fork or load.

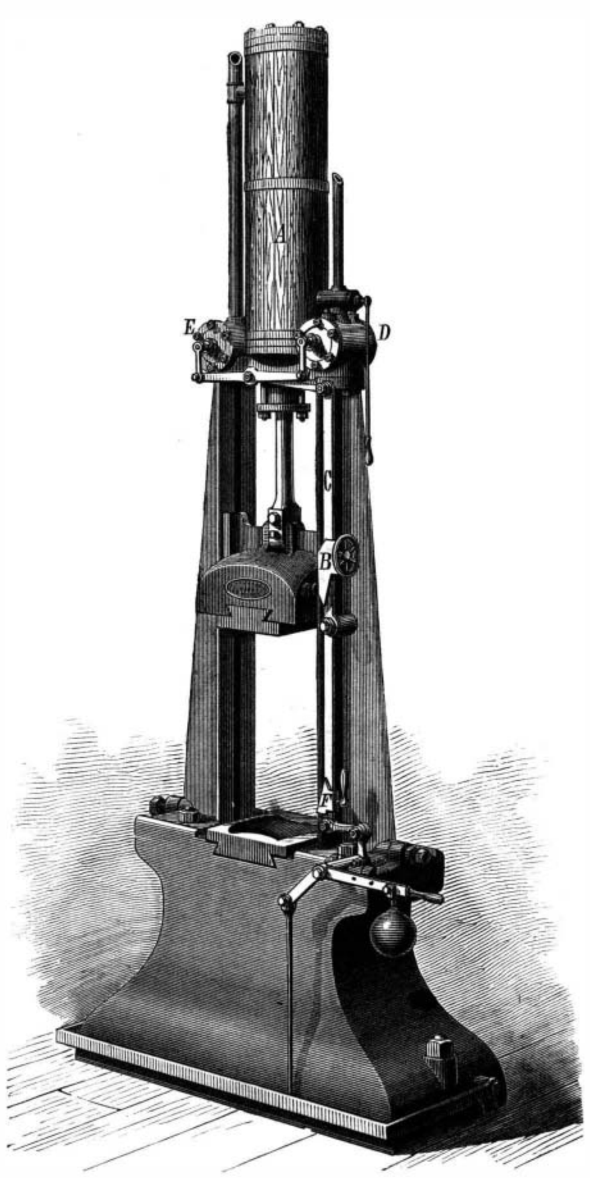


SMITH'S HAY ELEVATOR AND CARRIER.

The weight, G, is capable of being adjusted to the varying length of draft rope by being made in the shape of a hollow ball, that is filled with the required quantity of shot. It accelerates the carrying back of the fork pulley on the supporting rod, and of preventing any twisting or entangling of the draft rope, so as to interfere with the regular and exact working of the locking and releasing mechanism of the carriage.

HILL'S DIRECT-ACTING DROP HAMMER.

We illustrate herewith a new direct-acting steam drop



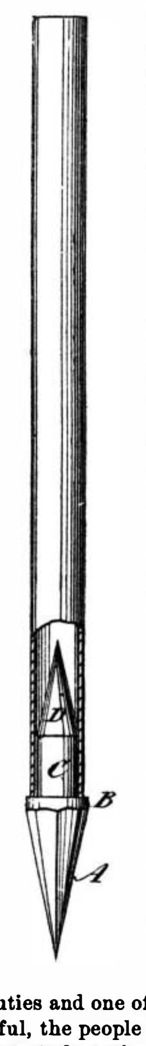
hammer for forging, forming, and welding metals, stamping sheet metals, and other similar purposes. It is self-moving and therefore requires no shafting, belting, or pulleys. The only exterior attachments needed are the pipes by which its cylinder is connected to the boiler. The mode of operation is as follows:

The hammer is secured on the piston rod of the steam cylinder, A. In the illustration the hammer is represented as ascending, and it continues this motion until it strikes an adjustable stud, B, on the pivoted bar, C. The latter, by a system of pivoted and counterweighted levers, connects with the treadle at the base of the machine. While steam is entering beneath the piston, and so lifting the hammer, it is obvious that the inlet valve, D, must be open, and the exhaust, E, closed. Both of these valves, by suitable levers, are connected with the bar, C. When the hammer strikes the stud, B, the latter moves the bar, C, in such a manner as to close the inlet valve, the exhaust still remaining shut. The steam under the piston now sustains the hammer. To drop the latter the operator presses the treadle with his foot, and in so doing he opens the exhaust valve through the medium of bar, C. The steam escapes, and the hammer falls until it strikes a second stud, F, also on bar, C, and thus pushes over that bar to cause it to open the inlet port. The steam, therefore, at once catches the hammer, obviates any possible rebound, and carries it up for a new stroke.

It will be seen that by moving the treadle the operator can cause the hammer to fall at any time during its ascent, arrest it at any time during its descent, or cause it to give light or heavy blows in rapid succession. at will. By adjusting the upper stud up or down on the bar, C, any length of blow desired may be obtained. By removing the counterweight shown on the left, and suitably adjusting the studs, the hammer can be made to continue indefinitely moving, setting its own valves, and delivering blows with any degree of rapidity or force. This is a useful advantage and one which will recommend the machine for purposes of forging and welding.

Patented May 2, 1876, to Thomas Hill. For further particulars address the owners of the patent, Messrs. Hill & Williams, corner 5th and Ohio street, Quincy, Ill.

IMPROVED TUBE WELL.



We illustrate in the annexed engraving an ingenious device for driving tube wells. It consists in a detachable point, A, against a shoulder, B, on which the end of the tube rests. Above the shoulder is a shank, C, which extends up into the tube and terminates in a tapered point. It frequently occurs, in making tube wells, that difficulty is met with by the filling of the perforations made above the point for the admission of water. The object of the device we have described is to obviate this, and to allow of securing an unobstructed entrance for the water, by raising the tube up to the conical part of the shank, after the plug has been driven to the required depth. Further, in case water is not found in sufficient quantity after the tube has been raised, it can readily be let down again on the plug to drive it still deeper.

The invention was patented through the Scientific American Patent Agency, April 25, 1876, by Mr. Stephen Henry, of Marshfield, Mass.

A Beauty Society.

Mr. George Dawson, in a recent lecture at Birmingham, England, said that the office of a man's house was not only to give shelter, food, and meat, but also to surround his children with those fair sights and sounds by which the sense of beauty might be developed. There were houses in that town in which not a poem was read nor a song sung throughout the year, and yet people wondered why their children were vulgar. Attention to the beauty of towns was one of the most neglected duties and one of the most deserving. If a town was beautiful, the people took pride in it, like to live in it, and were sorry to leave it In Birmingham they wanted a new society, to be called "the Beauty Society."

Remarkable Japanese Compass.

Mr. Frank Buckland, in *Land and Water*, gives the following account of a remarkable compass taken from the wreck of a junk at the entrance of Yokohama Bay, in 1874. The pilot by whom this instrument was discovered could give no information about the compass, except that it was found on board the wreck. It is of a circular form, measuring 13½ inches across, cast in bronze, and weighs 21 lbs. It has a thick rim, in which two ordinary compasses are set, one on each side.

The center of this remarkable plate-like looking object is considerably raised from the surface, and is covered with a number of raised spots or stars of various sizes, each more or less connected by lines with its neighbors. The shapes of these star-like objects are remarkable; in the center there are five which are larger than the rest.

Then there is another group very like a net; another group represents almost a complete circle of these stars; another represents a Y with the arms closed together; another a Y with the arms extended. Altogether, there are no less than two or three hundred of these elevated spots of different sizes. Running throughout the whole series are several lines radiating from a circle drawn round the center. The brass rim on which the compasses are set is divided into 360 degrees, the same as an English compass. At every thirty degrees there is a Japanese character.

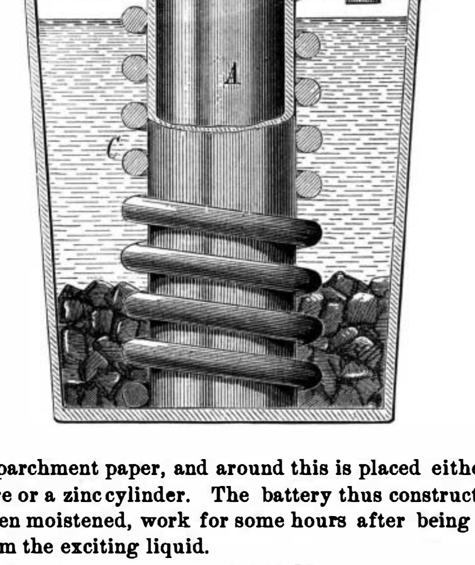
Neither Captain Murray, to whom Mr. Buckland is indebted for the loan of the compass, nor any one to whom he has shown this curiosity at home or abroad, has any idea whatever of the meaning of the star-like bodies in the center, or for what purpose the Japanese used them, but it is quite certain that they must have been of some use to them. It is most interesting that these rude characters should be united in the same instrument with the 360 degrees of modern civilization. The casting of this remarkable instrument is very marvelous. An optician, who cleaned it up for Captain Murray in Glasgow, said he had never seen a finer bit of work.

The Electric Light on a Transatlantic Steamer.

The French transatlantic steamer Amérique is now provided with an electric light, in order to prevent her collision with other vessels. The lantern is placed on the bow at a hight of 22 feet above the forecastle, or 42 feet above the water. The current is produced by a Gramme electric machine, revolving at the rate of from 950 to 1,000 turns per minute, and affording a light equal to 150 carcel burners. An ingenious device places the control of the light in the hands of the officer of the watch, and by this he can extinguish the illumination or renew it at will without stopping the machine. Experiment has recently proved that the most effective use of the light, as a means of warning, is to allow it to shine for ten seconds and then extinguish it for the succeeding two minutes.

A NEW ELECTRIC BATTERY.

M. Onimus recently exhibited to the French Academy of Sciences a new and simple battery, an engraving of which is given herewith. Instead of the usual porous vase he substitutes a diaphragm of parchment paper. The zinc cylinder, A, being enveloped in the paper, B, copper wire, C, is wound over all. The latter holds the paper against the zinc and answers for a fastening. The whole is plunged in the sulphate of copper solution, and the battery soon works regularly. For some carbon batteries, the carbon is enveloped



in parchment paper, and around this is placed either a zinc wire or a zinc cylinder. The battery thus constructed will, when moistened, work for some hours after being removed from the exciting liquid.

The following are useful memoranda for hydraulic calculations: 1 cubic feet of water=62·425 lbs.; 1 cubic inch of water=0·036121lbs.; 1 gallon=10 lbs., or 0·16 cubic foot. The pressure of water per square inch in lbs.=the head in feet multiplied by 0·4335. Sea water=1·027 weight of fresh water, or 64·11 lbs. per cubic foot