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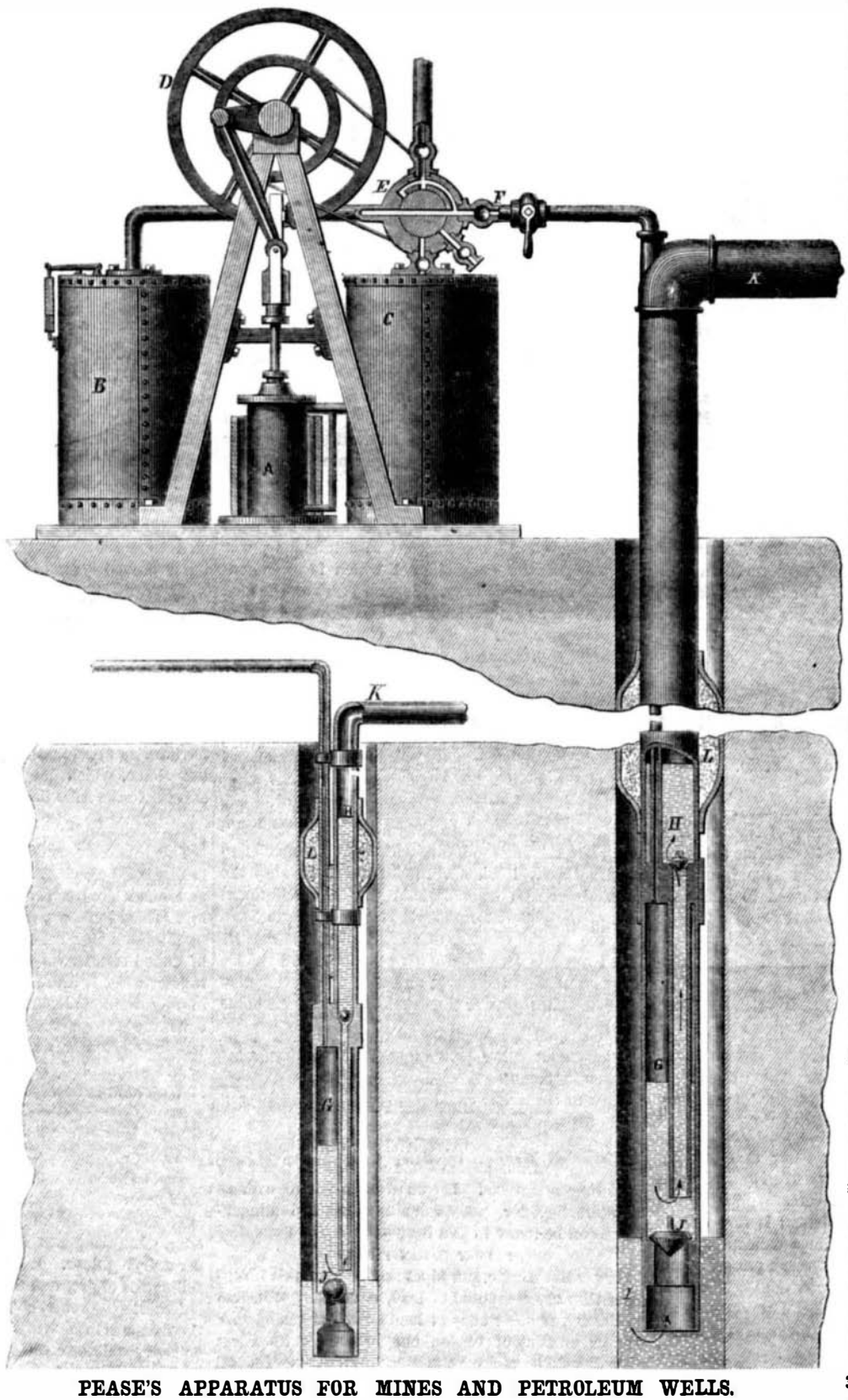
Apparatus for Mines & Petroleum Wells.

There are many points of coincidence connected with obtaining the natural riches of earth which render a consideration of them not uninteresting. When coal was first discovered, it cropped out near the surface, and was for a time easily procured. When gold was first found in California, nuggets were often picked up on the surface, and "pay dirt," as miners call gold-bearing soils, was to be found on all sides. So, too, with petroleum, oozing from the soil, filling up salt wells, overspreading the surfaces of streams, it forced itself on the attention of men, almost demanding to be collected. When a drill was driven into the earth, spouting columns of oil rushed upward with violence proclaiming the great stores hidden below. But coal is now obtained only at the cost of much labor and money. Nuggets no longer lie around loose on the surface; flowing wells are the exception, and not the rule as formerly. Nature having done her part in revealing the secret stores laid up for ages, leaves the procurement of them to the genius and enterprise of man.

The discovery of petroleum has called forth more ingenuity and occasioned the invention of more machinery within a given time than any other article of commerce; and, from signs, it would seem that the attention of the inventive public has but just awakened to its importance.

The engravings published in connection with this article, represent the principle of a new apparatus or system for getting petroleum, also for freeing mines of water, which promises unusual results. It is well known that nearly every possible means for aiding and augmenting the flow of oil in wells has been tried with more or less success. Compressed air has been employed, hydrostatic pressure, steam blown in at high pressure, torpedoes exploded, exhausted receivers—these and other devices have been brought forward and are in daily use. In the present invention the action of the apparatus is analogous to that of the low-pressure or condensing engine. A stream of compressed air is forced into the well by suitable means hereafter to be described; this air, acting upon the surface of the oil in the bottom of the well tube, forces it up the tube into a chamber, where it is sustained or prevented from returning. This compressed air is then exhausted, leaving a comparative vacuum, which causes the oil in the well to rush up to fill the vacuum. The alternate action of the pressure and exhaust causes a vibration or pulsation in the well tube, which results in filling the chamber at every pulsation, causing an enormous and rapid delivery of the precious fluid. The advantages of this system are, that there is no subterranean machinery—pumps for instance—to be operated at immense depths; there is consequently no delay in repacking pump plungers, no defective operation through faulty valves.



PEASE'S APPARATUS FOR MINES AND PETROLEUM WELLS.

The oil rises into a chamber of any given length, and is instantly elevated that length, whatever it may be. If an ordinary lifting pump has a stroke of thirty inches, the oil is raised that distance each stroke, but with this device, if the oil chamber is thirty feet in length, the fluid is raised so far each stroke, and at one half of a revolution of the valve. From this statement it is easy to see that the quantity raised by this system is far greater than is produced by half a dozen pumps. As the inventor says, it will take a good flowing well to supply it. One apparatus can be made to work a number of wells, it only requiring the arrangement in the well tube, and connecting the air pipe with the valve; any one well can work independently of the others, or all work together from one and the same power, of which there is always a surplus for contingencies. The lowest estimate of its capacity made by scientific and practical men who have examined it is, that it is equal to over two thousand two hundred barrels per day from a two-inch pipe, and four thousand and ninety barrels per day from a two-and-a-half-inch chamber; and over eight thousand two hundred barrels per day from a 3-inch pipe—the amount varying with the size of the pipe-tube, chamber and displacement pipe.

The mechanical parts of this system are few in number and not complicated; a brief statement will enable all to comprehend them.

A represents an air pump which exhausts the air from one of the receivers; upon the opposite end of the shaft is another similar pump used for forcing air into the receiver, B. Both pumps are driven by a

pulley and belt, D. The rotary valve, E, can be worked by a pulley on the shaft, or worked independent of the pumps. This valve is of peculiar construction and is covered by a separate patent. It opens and closes communication alternately with the well and the atmosphere and the vessels, B and C. The pipe, F, on which this valve is placed leads into both vessels. By the action of the valve, then, a charge of compressed air is forced down upon the surface of the oil in the pipe or chamber, G; the result is, that the oil takes the course indicated by the arrows, and rises into the chamber, H; by the continued actions of the rotating valve, E, the compressed air is exhausted immediately, so that the oil from below, at I, comes rushing up through the valve, J, to supply the vacuum, and thus raises the oil forced by the percussive action of the compressed air into the tank through the pipe, K. Of course the return of the oil is also prevented by the same valves. Where there is a sufficient amount or hight of oil or water in the well, only one receiver would be in use until the water was exhausted sufficiently to require the other; in such a case the pressure is relieved, by the valve only, to a sufficient amount to allow the chamber or vacuum to fill the pressure is counterbalanced, and the column of air vibrates back and forth.

For mines, or sluggish wells, or those rendered useless by the seams getting filled up, a chamber twenty or thirty feet, in a state of vacuum thirty or more times a minute, would draw in most everything but the rock. F is a stop-cock, and when closed it fairly seals the well up, for nothing can raise the valve or get into the lower chamber. L is the ordinary seed bag by which the tube is packed. M is a jacket to be filled with water to keep the air pumps cool.

Two patents have already been granted on this invention through the Scientific American Patent Agency, dated as follows—March 21 and March 28, 1865. Another application is pending before the Patent Office. Patents have also been secured through this Office in foreign countries. For further information address the patentee, F. S. Pease, Buffalo, N. Y.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening May 17, 1865, the President, S. D. Tillman, Esq., in the chair.

THE GEOLOGY OF NEW YORK CITY.

Dr. Stevens said that the Lyceum of Natural History had appointed a committee to examine the geology and mineralogy of Manhattan Island, and the geological examination was assigned to him. He then gave a detailed description of the appearance of the rocks as exhibited in the numerous excavations made in grading the streets, and stated the conclusion to which he had arrived.

The lowest deposit was a mud rock which has since been metamorphosed by chemical action into gneiss —stratified granite. Over this was a deposit of limestone. After the rocks were hardened, by one of those slow changes in the crust of the earth which are constantly going on, there came a very gradual pressure from the east toward the west, forcing the edges of the rock toward each other and bending the strata into folds. There are five of these folds between the Hudson and East rivers.

Mr. Ely remarked that this island is very rich in curious minerals. He had quite a collection gathered here; among them one that was a perfect plum.

Dr. Stevens said that that was doubtless a fossil which had been brought in by glacial action from the rocks above Haverstraw. The rocks of the island contain no fossils.

THE NEW THREE-CENT COIN.

Mr. Feuchtwanger presented for inspection one of the new three-cent pieces, and stated that it was composed of 75 per cent copper and 25 per cent nickel, which makes a very hard alloy. It takes 254 of the pieces to weigh a pound, and they cost the Government just half a cent apiece.

SOLID FLOATING ON MOLTEN METAL.

Dr. Parmelee observed that Mr. L. L. Smith was probably known to many persons present as a skillful electroplater of unusual scientific attainments.

Mr. Stewart:—He has made the finest electroplates ever made in the country.

Mr. Parmelee:—Yes. Well, Mr. Smith made an experiment to ascertain whether solid zinc will float on melted zinc, and he found that it would not. The kettle of melted zinc was 20 inches wide, and 12 inches deep; the melted metal within 3 inches of the top. The solid pieces of zinc were 6 inches long, 4 inches wide and 1 inch thick, and they would invariably sink.

Dr. Rowell:—If the solid zinc is of about the same temperature as the melted zinc it will always float; I have tried it twenty times. Perhaps Mr. Smith may have got a piece of metal cold enough to sink.

TUNNELING.

This being the regular subject of the evening, the President called on Mr. Stewart to open the discussion.

Mr. Stewart read a paper giving a description of a new tunneling machine invented by Major Plas. The machine is in the form of a car, with four radiating legs or arms by means of which it can be keyed firmly into the tunnel. A wheel, the diameter of which is nearly the same as that of the tunnel, carries several series of steel chisels disposed in concentric rings—these rings being two or three feet apart. By means of an engine driven by compressed air, the wheel is made to revolve slowly, the chisels at the same time being drawn back by means of cams, and then driven violently forward by stiff springs, thus striking the rock with their sharpened ends a series of rapid blows. In this way narrow circular grooves are cut in the rock to the depth of some two feet, when the workmen withdraw the wheel that bears the chisels, and insert steel wedges in the grooves. Then a massive iron ram is driven forward by the engine with great force, driving the wedges into the grooves and breaking the rock into blocks which can be readily removed.

Mr. Montgomery, of Brooklyn, said that the most interesting question connected with tunneling, was the plan of the great tunnel which is to be constructed under Broadway. Several years ago he filed a caveat for a plan which he still thought the best of any yet suggested. It amounts to sinking the present street right down to a level with the cellar floors, and constructing an iron street at the level of the present one. The lower street is to be provided with a double track railroad, with cars to be drawn by an endless wire rope, which will pass around immense drums at the two ends of the track, and be supported along the line by grooved wheels in the usual manner. The rope will have a constant motion, and the cars will be attached to it by an instrument something like the human hand, which can be opened to release its hold whenever it is desired to stop the cars. It can be demonstrated that the additional rent of the cellars for a single year will more than pay the whole expense of constructing this tunnel, that two cents fare from each passenger will yield a large interest on the stock, and that the speed may be three times greater than that of the present horse cars.

The subject of city transportation was selected for the next evening.

RECENT ENGLISH PATENTS.

By late mails we have received our usual full supply of foreign journals; from some of them we make the following selections. Let no one pass them over as uninteresting, for many valuable hints and suggestions can be found in this list:—

PATENT ORGAN PIPES.

In constructing organ pipes according to this invention they are composed of lead, or an alloy of it, and antimony, or other alloy of lead coated or plated with tin, or an alloy of tin, on one or both of its sides; this they do by making the pipes from sheets of metal made by coating a sheet of lead or alloy of lead on one or both of its sides with a sheet of tin or alloy of tin; or the plated sheets of metal from which the pipes are manufactured may be made by first coating an ingot of the alloy of lead with tin or alloy of tin, and rolling down such coated ingots into sheets of the required thickness for making into pipes.

PATENT DRESS FASTENINGS.

These improvements relate to buckles, clasps, hooks, and all kinds of fastenings generally, as also to the methods of manufacturing and ornamenting such articles, and, consist, first, in a new method of manufacturing and uniting the tongues and frames of buckles by stamping in a die, and then uniting the parts by pressure without the aid of solder. Secondly, in an improved method of connecting the several parts of the buckles, hooks, or other articles by means of eyelets, which are formed of a single piece with the frame, and folded down or turned over to permit of the passage of the pin or rivets uniting the parts of the buckle. Thirdly, in a method of attaching or fixing a ribbon or waist belt to the buckle or clasp without sewing. This the inventor effects by cutting two slits in the frame of the buckle in which the ribbon is doubled over, in order to fix it in position. The connection of the parts is effected in this case in a similar manner to that above described. Fourthly, the ornamentation of the improved pins, buckles, and other articles, by means of rivets having facets, or otherwise ornamented, which he fixes in the article, and then rivets at back on a second plate of similar form, in which is made the eyelet forming the improved fastenings. Fifthly, the buckles may be further furnished with a plate in their interior, the edge of which is turned up in the form of a hook, whereby it may be connected to the frame of the buckle, which is similarly formed at one end; in this case the buckle is solid, and without any openings; the exterior surface may also be ornamented in any suitable manner.

PATENT CATCH FOR INK BOTTLES.

This invention consists in the use of an additional catch or fastener, so arranged and constructed as to lock with that on the ink-bottle or box, and thus prevent its becoming accidentally opened. The usual aperture made for the reception of the hasp, such as is in use on the ink bottles at present manufactured, the inventor causes to be carried right through the lid of the box, and it is up and down this opening—which is made smaller on the outside than the inside—so as to retain the fastener in its proper position, that the improved system of catch is applied.

PATENT TOOTHED CHAINS.

According to this invention the sides of the chain are composed of as many links as required, and made of any desired ditch and strength. The distance between the inner links depends upon the thickness of the wheel, but over the pins which constitute the pitch and hold the links together he places hoops or ferrules, so fitted that they can turn on the pins, but not shake, which hoops or ferrules, are intended to substitute the solid links or pins before in use.

PATENT FLAT CHAIN.

This invention consists in forming flat chain either in bands for pit chains, driving bands for machinery, and other similar uses, or in sheets for armor plating, bridge building, and various other like purposes, by interlacing or screwing together separate lengths of coiled metal rods or wires. Each of these metal rods or wires is first formed into an open twist or coil of any desirable length and thickness. Two of these coils are then screwed or interlaced together, coil within coil, and any additional number of coiled rods or wires is similarly interlaced until the length or area of the chain is formed.

Use of Waste Heat in Kilns.

A correspondent of the London *Builder*, who appears to be a practical man, referring to the gases arising from Portland cement, says that while it is burning in the kilns a great heat is obtained by consuming the gases, and then passing the same under a drying floor. When alight, the gases are like a rolling sea of fire, and this will travel a great distance before it requires a chimney-shaft; that is to say, if the flues are in a straight line, the heat from the gas will dry well for a distance of 120 ft. in length, and 60 ft. in width. The kilns he speaks of hold, when burnt, 150 casks. There is a greater improvement, however, which, our correspondent suggests, could be made; first, to let the heat work another set of flues while the men are taking off the stuff, and as soon as they have it off they could shut off another bay; or they might shut off nineteen flues out of twenty, and let the heat work up the one, which would be much better for men working on these hot flues. Secondly, by having a coke oven beside the furnace the gas from this would pass through the coke