BOATING OIL TO MARKET—A "POND FRESHET."

In a recent interview with a gentleman connected with the petroleum oil operations in the mountains of Pennsylvania, we were much entertained with the account he gave of the manner of boating the oil down the creek which runs through the oil regions. As we were about to write out this narrative we met with a full printed account of the *modus operandi*, which we herewith re-publish;—

"By far the most exciting operation of our oil business is the 'pond freshet.' It will richly repay a journey of many hundred miles to see it. Imagine some two hundred boats of all sizes, loaded with oil, coming down on a rushing flood, in a narrow creek, twelve rods wide, where it requires all the skill and strength of some five hundred stalwart boatmen to avoid colliding with other boats or rocks and obstructions, and you can form some idea of it. But our purpose is to describe what a pond freshet is, and how it is caused. The bulk of oil comes from wells located from four to six miles above this point. To get this oil to Oil City, from whence it is shipped to all points, we have to haul it in wagons or float it down Oil Creek in boats.

"A great portion of the business season, the roads along Oil Creek are impassable. Besides this, teaming is an expensive and slow mode of transportation. It takes days, and frequently weeks, to transport a few thousand barrels a few miles, for the reason that when shippers are in the greatest haste, teams are scarce, and prices rule accordingly. Upon the freshet the shipper can run his cargo of oil to this port in a few hours. It being the cheapest and most expeditious mode of getting the oil out from the wells, it is of course preferred by the shippers. With this explanation we will endeavor to give the reader an idea of the mode in which the freshet is formed and finally let loose:—

"A pond freshet is a temporary rise of water in the creek, for the purpose of running out logs, rafts, boats, &c. The water rises high enough to run out boats, containing sometimes five hundred, and, in some few cases, seven hundred barrels of oil. There are usually from one hundred and fifty to two hundred and fifty boats on each freshet. It lasts from one to two hours, and is caused by letting the water out of from seven to seventeen dams on the principal branches of Oil Creek, so that the water will all meet together, making quite a flood, upon which from seven thousand to thirty thousand barrels of oil are run in boats to the river.

"The dams are built with a solid abutment at each end, and often one in the middle. Between these abutments there are timbers made very solid in the bottom of the creek, in which mortices are made every three or four feet. On the top of the abutments, which are usually from ten to twelve feet high, other timbers are fastened, spanning from one to the other. These timbers are directly over or a few inches below the row of mortises in the lower timbers at the bottom of the creek. Scantling, from six to eight inches square, and ten to twelve feet long, with a tenon on one end, so as easily to enter the mortises in the timber in the bottom of the creek, are prepared and stood up perpendicularly, the lower end in the mortise, and the upper leaning against the timbers which span the abutments. Then loose boards are placed on the upper side of these studs or posts, which are firmly held to their place by the weight of the water. Thus the dam is completed. When we wish to make a pond freshet we go to the upper dams on the different branches of the creek, some of which are twelve miles above Titusville, and commence about midnight either to pull with a lever and chain, or cut away these studs, and the water all rushes out of the dam at once. We then wait until this water gets into or commences running over the next dam, and then cut it away, and keep repeating this process until we come to the lower dam three miles below Titusville. When it, which is a very large dam, is cut, we have let loose all in one body, in some cases, the water of seventeen dams, which makes a rise of from twenty-two to thirty inches above the highest rock on the swiftest ripple. The studs are again put in, water collects, and the mill-men saw and grind until they are all stopped from twelve to forty-eight hours by the next pond freshet.

"The shippers and boatmen, having been notified of the day upon which the freshet is to take place, begin to make preparations several days previous to it. Boats are overhauled, put in order and then towed, by men or horses, to the point on the creek from which they intend to start. The boats are then loaded and everything made ready for the coming flood which is to waft them to that much-desired harbor, the mouth of the creek. About the time the freshet is expected, the boatmen stand ready to let loose their lines. A cool rushing breeze is the first sign of it, and soon after come the swirling waters. Inexperienced boatmen generally cut their boats loose upon the first rush of water. As a matter of course, their boats run ahead of the water, and get aground upon the first ripple or shoal. The creek being very narrow, and the force of the current generally swinging the boats across it, a jam, and not unfrequently a great loss of boats and oil ensues, just from the inconsiderate haste of a few. The experienced boatman waits at his harbor until the water commences to recede, then cuts his line loose, and trusts himself to the mercy of the swift current, and come into port upon the highest part of the rise. The current of a first-class pond freshet will run at the rate of six miles an hour, an ordinary one about four miles, and a small one two miles and a half. If the boatman meets with no obstacle, he soon anchors his craft at our wharf.

"There are several points of the creek where formidable obstacles are interposed to vex the navigator. Among these are the pier at the McClintock Bridge, and a pier, to support the machinery of a well, in the middle of the creek immediately below, the Forge Dam, though which is only a narrow passage for boats; the pier of the bridge at this place, and the bar at the mouth of the creek itself. One boat getting across the creek at either of these points is apt to cause a 'jam.' The boats are crushed against each other, and being generally built very light are easily broken, and if loaded with bulk oil the contents are poured into the creek. If in barrels, the boat sinks and the barrels float off, and the owner rarely recovers all of them again.

"Once landed at our wharves, the boat is unloaded, but if the water is in good boating state, the boat goes, after brief preparation, to Pittsburgh."—*Oil City Register.*

The Usefulness of Diamonds.

Many persons suppose that diamonds are only used as jewelry—for rings and other articles of personal adornment; and that they are really of no essential value whatever in the practical arts. This is a mistaken notion; they are used for a great number of purposes in the arts. Thus, for cutting the glass of our windows into proper sizes, no other substance can equal it, and it is exclusively used for this purpose. A natural edge or point, as it is called, is used for this work, and thousands of such are annually required in our glass factories. Diamond points are also employed for engraving on cornelians, amethysts and other brilliants, and for the finer cuttings on cameos and seals. Being very hard, the diamond is also used in chronometers for the steps of pivots; and as it possesses high refractive power, and little longitudinal aberation, it has been successfully employed for the small, deep lenses of single microscopes. The magnifying power of the diamond, in proportion to that of plate glass, ground to a similar form, is as eight to three. For drawing minute lines on hard steel and glass, to make micrometers, there is no substitute for the diamond point. The rough diamond is called bort, and the "points" used for glass-cutting are fragments of the borts. Great care and skill are necessary in selecting the cutting points, because the diamond that cuts the glass most successfully has the cutting edges of the crystal placed at right angles to each other, and passing through a point of intersection made by crossing the edges. A polished diamond, however perfect may be its edges, when pressed upon the surface of glass, splinters it with the slightest of pressure; but with the natural diamond the most accurate lines are produced on glass, and their surfaces are so finely burnished, that if ruled close together, they decompose light, and afford the most beautiful prismatic effect—all the colors of the rainbow flash from them as from the silvery interior of a pearl oyster shell. Diamonds are also employed as drill points to perforate rubies, and bore holes in draw plates for fine wire, and also for drilling in hard steel. Some inquiries have been made recently in regard to using them as a substitute for steel picks in dressing mill-stones. We apprehend that they are altogether too expensive for this purpose at present; but if some of our inventors would make the discovery of manufacturing diamonds as cheaply as we make charcoal, which is of the same composition, we might be able to recommend them to our millers. The coke obtained from the interior of gas retorts, in many cases, is found so hard that it will cut glass, but as its point endures but for a short period, it cannot be made available as a substitute for the natural diamond for such purposes in the arts.

Culture of Hyacinths in Glasses.

The hyacinth is the bulb most usually grown in winter in the house, and when properly treated will bloom more finely, and the flowers will continue much longer than in the open air. Culture in glasses and in pots are the most usual methods of growing this beautiful plant in the house.

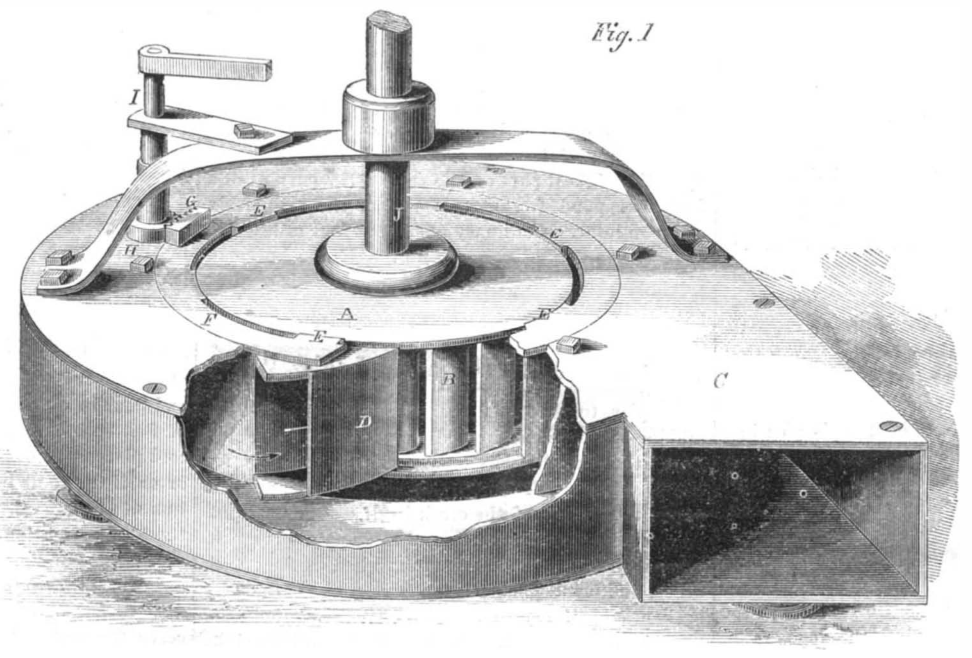
In culture in glasses the largest bulbs should be selected, as it must be borne in mind that in this method of treatment, the whole substance of the leaves and flowers comes from the body of the bulb, as nothing in the way of nutriment is derived from the water. In selecting hyacinth glasses the darkest colored should be chosen, as the roots of all plants shun the light. Place the bulbs on the glasses and pour in water until it just touches the bottom of the bulb. Now set the glasses away in a dark cool place, where they may remain for several weeks, or until the roots have reached half way to the bottom of the glasses. When this is the case, remove them to a situation where they will receive a moderate amount of light, and as soon as the leaves show a healthy green color, they may be placed in their final situation, which should be where they can receive the greatest amount of light and plenty of fresh air. The top ledge of the lower sash of a window is frequently used for this purpose, and is a good situation, for here they get the greatest quantity of light, and are kept cool by the air which will always creep in where the two sashes meet. The water will need to be changed once in two weeks, and this should be done without removing the bulbs, as there is danger of the roots being injured in returning the bulbs to the glass after removal. It will sometimes occur that a slimy matter will collect around the roots. When this is the case, the bulbs must be carefully removed, and the roots washed with gentleness and the utmost care. The glasses should be washed out before replacing the bulbs, which operation must be conducted with judgment and much caution, or the roots will be broken and the plants suffer. The water used in refilling the glasses should always be of the temperature of the room. It is recommended, by way of stimulant to the plants, to dissolve an ounce of guano in a quart of rain water, and put one teaspoonful of this solution in each glass once a fortnight, after the flowers begin to appear.—*Country Gentleman.*

To Put a Paper "Positive" into a Looking-glass.—A correspondent sends us the following, which may interest some of our readers:—Having cut out the picture, take a quarter plate glass, well cleaned, lay a sheet of tin-foil on two or three thicknesses of cloth or paper, and spread some quicksilver with a piece of cotton wool. Next, attach the portrait with varnish to the glass. All being ready, lay a sheet of clean paper on the top of the quicksilver, and place the glass, with portrait attached, on the sheet of paper. Now press hard and draw out the sheet of paper gently. The quicksilver will run round the edge of the portrait, making a beautiful looking-glass with a portrait in the center, giving an effect something like a daguerreotype.—*Photographic News.*

Sizes of Nails.—Why are nails designated by the terms sixpenny, eightpenny, &c.? In Sheffield, England, they used to be sold in small quantities by the hundred; and the terms fourpenny, sixpenny, &c., referred to such nails as were sold at fourpence, sixpence, &c., per hundred nails. The length of the nails of that day, that were so designated, was exactly the same with nails that are now known by those designations.

Inproved Patent Water-wheel.

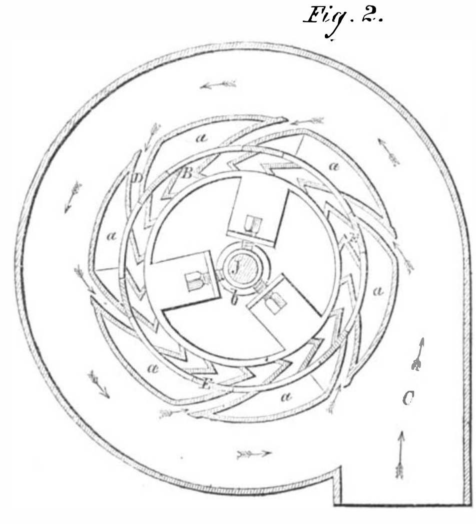
There would appear from the plans which come under our notice, to be a constant and laudable struggle between inventors to see who can produce the cheapest and most efficient motive-power. Wind-wheels alternate with water-wheels, steam engines and caloric engines; these multiply and change themselves yet again into forms and varieties which are almost endless in their details and general construction. We herewith present our readers with an illustration of an improved water-wheel which possesses many features of interest. The wheel, A, is provided with a number of buckets, B, of a peculiar shape; the smallest circumference described by the ends of the same has wings which project laterally toward the center of the shaft, forming an angle with the main part of the bucket, which may be rendered intelligible by likening the bucket and its appendage to the letter L placed horizontally. The water-box, C, by which the water is conveyed from the penstocks to the wheels, has a number of radial openings or chutes, D, placed at a diverging line with the circumference of the box itself. The mouths or openings of these chutes are provided with gates, E, curved to suit the diameter of the circle described by the former, and connected continuously by a flange or ring, F, working loosely about the wheel. The top ring is furnished with a toothed rack, G, having a pinion gearing into it. This pinion is fastened to the vertical shaft, I. Fig. 2 represents a section of the water-wheel wherein the chutes, gates, and the buckets are plainly seen.



CUMMING'S PATENT WATER-WHEEL.

The chutes pierce the case at regular intervals and are curved in the direction of their discharge so as produce a centripetal action of the current. The spaces, *a*, between them have an important effect upon the operation of the wheel; they serve as frictionless spaces opposing the resistance of a water cushion when the wheel is submerged, for the water to recoil against after having spent its force upon

Fig. 2.



the buckets. The arms running toward the center of the wheel carry the step, *b*, which the shaft J, runs in; the set screws afford an opportunity for correctly adjusting the same with reference to the center. The action of the current of water through the chutes, on alternate sides of the wheel, tends very much to preserve the wheel from unequal strain, caused by an indirect action of the force exerted by the current just mentioned. It will be seen that, as the arm attached to the upright shaft is moved, the pinion engages with the rack and rotates the gates on an imaginary axis. They thus cover the mouths of the chutes or recede from the same, thereby decreasing or enlarging the volume of water which is thrown against the buckets, and proportionately diminishing or augmenting the power exerted by the water on the wheel. Also that the spaces between the chutes allow of the free egress of the water when its force is spent, and prevent any of the evils arising from back water. The arrangement of these chutes and gates is novel to us, and the wheel looks as though it might prove an exceedingly efficient one, and they also afford a quick and certain method of regulating the amount of power required by the work to be done.

The patent for this invention was granted on Dec. 2d, 1862, to D. M. Cummings, of Enfield, N. H., and further information may be had by addressing him at that place.

More about Bessemer Steel.

The extreme toughness of the Bessemer iron was proved by the bending of a cold bar of 3 inches square, under the hammer and into a close fold, without the smallest perceptible rupture of the metal at any part; and the bar was thus extended on the outside of the bend from 12 inches to $16\frac{3}{4}$ inches, and was pressed on the inside from 12 inches to $7\frac{1}{4}$ inches, thus showing a difference in length of $9\frac{1}{2}$ inches between what, before bending, were the two parallel sides of a bar 3 inches square. Again, an iron cable, consisting of four strands of round iron $1\frac{1}{2}$ inches in diameter, was, while cold, so closely twisted as to cause the strands at the point of contact to become permanently imbedded into each other. Each of these strands had become elongated to $12\frac{1}{2}$ inches in a length of 4 feet, and had diminished one-tenth of an inch in diameter throughout their whole length.

Steel bars, of 2 inches square and 2 feet 6 inches in length, were twisted cold into a spiral, the angles of which were about 45°; and some round bars, 2 inches in diameter, were bent cold under the hammer into the form of an ordinary horse-shoe magnet, the outside of the bend measuring 5 inches more than the inside. The steel and iron boiler plates, left without shearing and with their ends bent over cold, afforded ample evidence, too, of the extreme tenacity and toughness of the metal; while the clear, even surface of railway axles and pieces of malleable iron ordnance were examples of the perfect freedom from cracks, flaws or hard veins. The tensile strength of this metal was not less remarkable. The several samples of steel tested in the Proving Machine at Woolwich Arsenal bore, according to the reports of Colonel Eardley Wilmot, R. A., a strain varying from 150,000 pounds to 160,000 pounds on the square inch. Four samples of iron boiler plate similarly tested, bore from 68,314 pounds to 73,100 pounds; while, according to the published experiments of Mr. W. Fairbairn, Staffordshire plates bore only 45,000 pounds, Low Moor and Bowling plates a mean of 57,120 pounds per square inch. Of course, the cost of production of the materials was considerably less than that of the plates put into competition with Mr. Bessemer's; and here another advantage of no slight consequence is evident.—*London Mechanics' Magazine.*

Lake Superior Silver.

The silver found at Lake Superior is native, and is the most extraordinary metallurgical paradox yet discovered, in which Nature has shown that she can completely surpass art. It is found in large quantities in the native copper mines of that district. The combinations of the silver with the copper present most varied forms; in some instances the native silver is found running through a mass of native copper in veins of varied thickness, like veins in marble; at other times it is found attached to masses of copper, in many beautiful floriated forms of a large size, and sometimes resembling the stumps of old trees, and frequently covering the whole surface of a mass of copper on all its sides, to a considerable thickness, and presenting most beautiful forms in cubes, prisms, and four-sided pyramids, which appear as though the whole mass of copper had been thickly electrotyped with the precious metal. Its varied forms and its extreme purity, although in conjunction with the copper, renders it a subject of the greatest curiosity; both metals having been subjected to a heat that must have, in any event, been equal to a refiner's smelting heat, and yet the metals are each found in perfect purity. In all the mass of copper of this vast district silver is associated with it to a greater or less degree, but not in sufficient quantity to pay for its separation. The rock in which the silver of this district most abounds is an amygdaloidal trap, of a very compact nature. The miners of this district, for many years, considered the native silver as a perquisite—as they used to say they were employed to mine for copper and not for silver; therefore the proprietors rarely used to get the silver, but the miners always had an abundance. This state of things now no longer exists, and the proprietors get a large share of this valuable production.

In a contribution to the *Washoe Times*, Mr. J. B. Truckee states that he had the most valuable collection from the Superior mines in Europe, and he was solicited by the commissioners for mines and minerals of the Paris Exhibition to form an illustration of the productions of the mines of Lake Superior, who undertook to return the collection, intact, when the exhibition should have closed. But at the time he looked for its return, he was waited on by two gentlemen, who came from the Emperor of France, to request that the collection might remain at the School of Mines in Paris, as it was the greatest curiosity that ever had been seen. As that school is the first of its class in the world, the collection is there for the benefit of the profession generally.

In the collection named there are crystals of pure native copper in clusters, in perfect cubes, to which is attached pure floriated native silver.

A BELGIAN glass-blower has lately blown two large bottles, each of a capacity of sixty-two and a-half gallons, and weighing fifty pounds. They were blown at the glass-works of Lefevre & Co., at Lodelingart, and are nearly double the size of the largest bottles heretofore made.

PILOT KNOB, in Missouri, is a conical mound of a sugar-loaf shape, 550 feet in hight, and covering 500 acres. According to an estimate, it contains no less than 220,000,000 tuns of iron ore, having sixty-five per cent of pure metal in it.