

once in twenty-four hours, so that the date changes automatically at the proper time, and a watch is obtained which, with a trifling additional expense, will prove to be of great convenience for business men, clerks, and, in fact, for the public in general. E. Oppenheimer, of 8 Maiden Lane, New York City, is the inventor.

Steam Valve.—This invention relates to a plug valve, which is provided with a steam passage, extending transversely through the plug and bell-shaped at its end, leading to the induction port, in combination with a shell, having three apertures, one of which serves to admit steam to the shell, while the other leads to the exhaust pipe, and the third to the cylinder, in such a manner that the induction port in the aperture leading from the shell to the cylinder is always open, and by turning the plug it is alternately made to communicate with the steam supply pipes, and these with the exhaust pipe, and consequently a shifting motion imparted to said plug valve changes the steam instantaneously. Wm. H. Akins, of Dryden, N. Y., is the inventor.

Well-Boring Instrument.—The object of this invention is to produce an instrument by means of which a well may be bored and reamed rapidly, cheaply, and efficiently, without the use of sand pumps or reciprocating drill. A borer, having something of the character of a brace and bit-iron reamer, is provided with three or more curved cutting faces placed at equal distances around its point, and is connected with the base of a hollow cylinder by a socket joint. Its curved cutting faces take a spiral form, and are continued up to the top of the cylinder, thereby forming parallel spiral grooves on the outside thereof. The burr cutters reduce the rock below it and along its sides, while the edges of the spiral grooves act as reamers, the grooves themselves performing the office of elevators, and raising the silt or reduced rock nearly to the top of the cylinder, where the grooves are intersected by openings which admit the silt and reduced rock to the inside of the cylinder, from which they are discharged, when it is full, by raising the instrument from the well and removing the borer. The hollow cylinder may be made long enough to hold all the silt that will accumulate while the burr is being worn dull in boring ordinary rock. The burr and cylinder should be made of a combination of Franklinite or crystallized iron, so called, for the purpose of obtaining a hard and tenacious substance. A water pipe runs centrally through the hollow cylinder and through the burr, branching, however, before reaching its point, so that a branch issues in each of the sunken arcs that occurs between the cutting edges of the burr and as near its point as the strength required to be given to that part will admit of. A column of water is allowed to descend this tube (the tube being connected with a hollow drill rod) and issue at the end of the burr, so as to clear it of accumulations of reduced rock. The pressure of the water will cause it to ascend around the cylinder and thence to the top of the well, the heavier portion being received into the interior of the cylinder through its lateral openings, and the residue being carried with the current of water to the surface of the ground. Samuel H. Whittlesey, of Appleton, Wis., is the inventor.

Buckle or Belt Clasp.—This invention, by I. N. Plotts, of New York City, consists in certain improvements in buckles or belt clasps, which improvements are particularly applicable to a buckle or belt clasp, for which letters patent were granted to said Plotts on the 7th of November, 1865, in which patent the buckle was shown as being constructed of a rectangular or other shaped frame, and slightly curved or bent transversely, having one or more cross bars, provided with lips on their outer edges to insure a better hold upon the straps, the object being to avoid the use of the tongues or teeth employed in ordinary buckles, which perforate the strap or band and soon weaken it so that it is liable to break, or at least so injure it as to render it useless. The invention, which is the subject of the present patent (the claims may be found in the list published this week) consists in the manner of setting the bars of the buckle so as to produce a sharp bight or bend of the straps; and in attaching lips to the inner edges of the under side of the buckle; and also in milling or serrating the lips as well as the raised or depressed edges of the bars or frame of the buckle—

by which improvements the inventor claims that the possibility of the strap slipping is entirely precluded, and this effected without in the least impairing the qualities of the buckle for permitting the strap or band to be quickly and easily tightened up or loosened or released from the buckle. We are informed that Messrs. Wests, Bradley & Cary have adopted the buckle for use on the bands of their Duplex hoop skirts. These buckles are very simple in their construction, and can be manufactured and sold very cheaply. Mr. Plotts may be addressed at 240 Broadway, Room 19, or 97 Chambers street, New York City.

tubing Out and other Wells.—This invention consists in surrounding the well tube of an oil or other deep well, through which oil or other liquid is usually raised from the bottom of the well, with an outer, supplementary tube extending downward from above the surface of the earth to a point below the place for applying the usual water packing, and applying such packing around the said outer tube, instead of the well or pump tube. James D. Bryson, Petroleum Center, Pa., is the inventor.

Machine for Treating Peat.—The object of this invention is the preparation of peat for fuel in a condensed state, with or without coal dust or other fine concentrated combustible matter, so that it can be handled with convenience and transported with ease and economy, to be used at a distance from the place where it is dug. It consists in a combination and arrangement of devices, by means of which the peat is reduced to a suitable condition and form for being handled and dried, the crude peat being elevated by mechanical means to the top of the machine and delivered to the action of knives or arms which revolve between fixed knives or arms so as to break it up. This action on the peat is had beneath a hopper, from which is delivered continuously a supply of fine coal dust or other fine concentrated combustible material. It is next passed between smooth cylinders of unequal diameters, or between cylinders which are revolved at unequal velocities, whose action is to destroy the natural organization of the peat and to destroy the tabular character of the undecomposed fibres which are interlaced through it, rubbing and grinding the mass so as to reduce it to a very fine plastic state. From thence the peat descends or is carried against molders, which consist of rollers, upon whose peripheries are formed triangular depressions, which are arranged on one roller conversely to their arrangement on the other, so that when the depressions meet or articulate in the revolution of the rollers, a cavity is formed whose sides are parallel. The peat mass presses by gravity against the faces of the rolls and fills the depressions as fast as they are presented, and is afterward delivered upon the other side of the rollers, on a travelling belt or platform, which carries it to the drying ground or to workmen who remove it to the place where it is to be dried. Thomas J. Wells, of 35 Pine street, New York City, is the inventor.

Coloring Meerschaum Pipes.—The object of this invention is to give to smoking pipes, known as meerschaums, the peculiar color which has hitherto been slowly and imperfectly imparted to them only during a long time of constant use in smoking tobacco in them; and it consists in covering the bowl of the pipe with a close fitting cover, penetrated by a tube through which, when the pipe is used, tobacco smoke may pass and enter the pipe on its way to the mouth of the person who is engaged in smoking. The tobacco to be smoked is contained in any ordinary receptacle or bowl placed at the outer end of, or otherwise connected with, the tube, or it may be fixed on the tube itself, according to the mode of using tobacco cartridges, shown in the patent granted to the inventor November 1, 1864. The treatment herein set forth may be applied to other pipes besides meerschaums. Holman J. Hale, of 16 Beekman street, New York City, is the inventor and manufacturer of this unique improvement.

Compression Gage Cock.—One of the objects of this invention is to arrange and construct a gage cock in such a manner that while it is simple, both in construction and operation, its valve may be re-ground to its seat when it becomes leaky without disturbing the joint connecting it with the boiler, and without the use of tools of any kind or description. Another object is to construct a compression gage

cock in such a manner that while its valve is free to move in a longitudinal direction, so that it may at any time be withdrawn, and while it is also free to rotate on its axis, so that it can be re-ground, yet the said valve will not rotate on its seat in the act of closing. Another object is to construct a compression gage cock provided with a metal valve and valve stem, in such a manner as to dispense with the use of a stuffing box or gland to pack the said stem, at its outer end, and admit of the cock being operated under high pressure without the possibility of scalding the hand of the operator. John Broughton, of 41 Centre street, New York, is the inventor.

American Pirate Beehive.—Important improvements are claimed in this hive, based on the recent discovery, that *cera alba* is elaborated into hexagonal cells by a law inherent in the substance itself, and not by the mechanical or artistic skill of the bee. The improvements consist in combining walls with air-chambers in such a way as constantly to secure that mediocrity of the temperature necessary to the formation of an amount of comb equal to the working capacity of the swarm. Such is the form of the hive that seams and windows for ventilation are excluded. The top and sides of said hive are, at the will of the operator, rendered air-tight. In the brood chamber, a number of comb guides are so arranged as to secure uniformity and rapidity of growth. The inside improvements consist in making brood chamber and honey box of slats of convenient size, and surrounding said slats with varnished paper, which may be separated at pleasure. To protect the bees against the ravages of the moth, an apparatus, made of tin, and resting on the bottom board, is closely fitted to the inner surface of the hive. This apparatus somewhat resembles the letter U inverted, the interior shank of which is so shortened as to place it out of the reach of worms on the bottom board, while a slight coat of soft grease, on its inner surface, prevents their reaching it by that route. Messrs. Lemuel and Minor Taylor, and Edwin Cox, of Jordan, Wis., are the inventors.

THE NAVAL RACE.

The last scene of all in this vexed question took place on the 13th and 14th inst., culminating in the race previously alluded to in this journal as about to occur. We were not on board either of the vessels but take our account from the daily papers.

The *Winooski* beat the *Algonquin* 70 miles in 390—a very bad beat. The *Winooski* is a naval vessel, with an ordinary inclined engine; the *Algonquin* is also a naval vessel, with an engine designed by Mr. E. N. Dickerson. The point of dispute was the ability of the *Algonquin* to run further and faster than the *Winooski*, and to tow her back over her course after the latter's coal gave out. This programme was slightly changed in the actual performance, as the *Algonquin* was behind, and not the *Winooski*.

It is impossible to tell the actual performance of the engines from the daily press reporters' accounts, as they print anything told them—as for instance this ludicrous statement:—"About an hour after starting, the main feed pipe, which conveys the condensed water to the boilers, got out of gear, and soon after ceased working altogether; thus obliging the use of the auxiliary engine to supply the boilers with salt water, which was, of course, highly detrimental to the workings of the engine, inasmuch as salt water clods or chokes the flues."

Clods the flues!

The *Algonquin* carries high steam, 65 pounds, and cuts off short. The *Winooski* carries low pressure, and cuts off at $\frac{7}{10}$ ths of the stroke in "Engineering Precedents," but at less than half-stroke in practice. The average revolutions in the race of the *Winooski* were 21 $\frac{1}{2}$; of the *Algonquin* 18. Although the latter vessel was beaten, it is contended that her engines comply with the terms of the contract, and are therefore to be accepted by Government.

A LOCOMOTIVE passed over the Hudson River Bridge at Albany, for the first time, on Thursday, the 15th inst.

MORE than 1,000 farm engines are built annually in England.

Improved Paddle Wheel.

The novelty of this wheel consists in so feathering the buckets that they will, during their entire revolution, radiate from a point at the summit thereof. The mechanical construction is extremely simple and embodies great strength and durability. The principle upon which the wheel is designed may be briefly stated as follows, reference being had to the diagram, Fig. 4:—

If two circles, $x-y$, of unequal diameter, be drawn eccentric to each other, but tangent at a point, o , and each circle be divided into the same number of unequal parts, 1, 2, 3 and $1a, 2a, 3a$, etc. (numbering from the common point, o), and lines 1— $o, 2—o,$

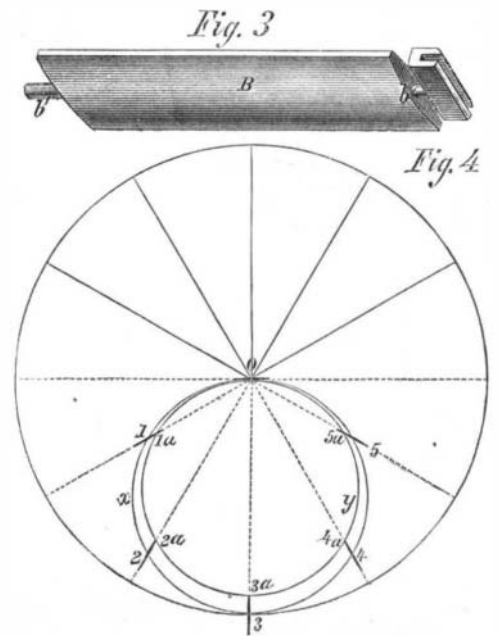
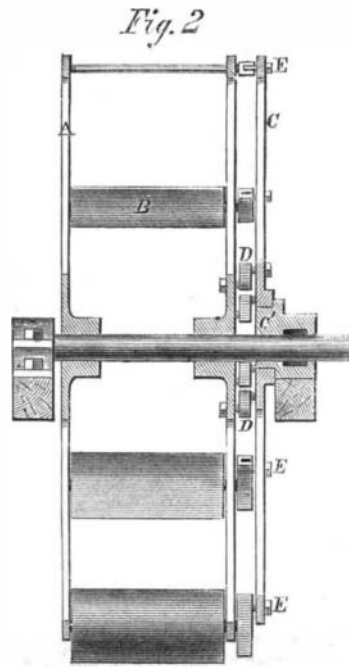
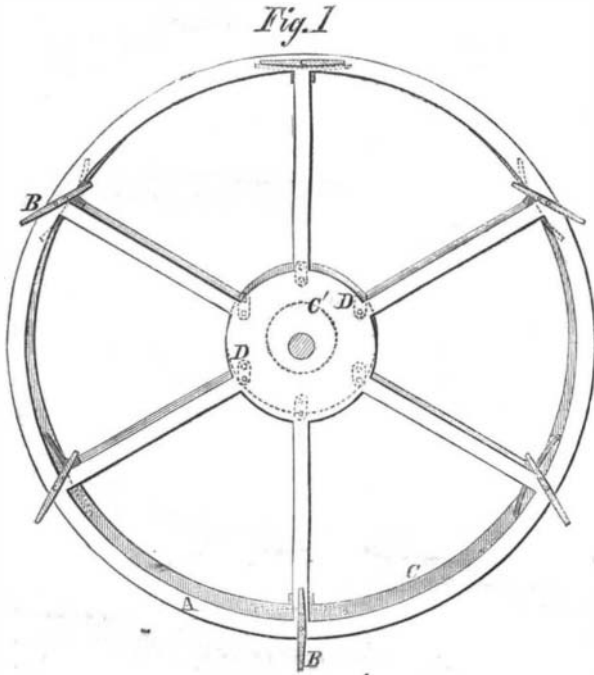
power from plunge and lift on the entrance and exit of the buckets from the water. The angle of the buckets of this wheel and its efficiency are the same as would be obtained by a common central radial wheel of double its diameter—that is, a wheel on this plan, of say six or twelve feet diameter, has the same propelling angles, respectively, as a common central radial wheel of twelve or twenty-four feet diameter. This is at once made evident by an inspection of Fig. 4. As compared with the screw propeller it possesses the advantages of direct over oblique action of its buckets to the water. This ability to work effectively under any degree of immersion, makes this wheel, the inventor states, spe-

At Mr. Simonson's yard, near the Novelty Works, we found several new ships for the Norfolk and Richmond line under way. These ships are to be side-wheel vessels, 260 feet long and 40 feet wide. One of the ships is to have a feathering wheel on Manly's patent.

The Sound boats for the Merchants' Steamboat Co., of Bristol, R. I., are building here, and are to be magnificent in design and proportions. They are 374 feet long and 50 feet beam, with heavy timbers and frames.

Several other ship yards are doing a good business.

Since the close of the war the ram *Dunderberg*,



3— o , etc., be drawn from the points of division of the larger circle, x , to the common point, o , these lines pass through the corresponding points of division of the smaller circle, y . Now, if the circles are supposed to revolve each upon its own center and with equal angular velocity, the point of tangency, o , will remain fixed, and the relative position of the points of division of both circles, x and y , with reference to each other and the common point, o , will not, at any time, be changed; a line drawn through a point of division of one circle, and the common point, o , will always pass through the corresponding point of division of the other circle.

To apply this principle to the construction of a paddle wheel, the rims of the side frames which support the buckets are made to perform the functions of the circle, x , the points of division becoming the bearings in which the buckets are supported by central axial journals; and the rim of an auxiliary or "feathering" side frame is made to perform the functions of the circle, y , the points of division becoming studs which enter grooves formed in the ends of the buckets, parallel to the plane of their surfaces, so that each bucket is supported at two points in the plane of its surface. These two points, as has been shown, bear such relation to each other and the summit of the wheel, that a line or plane passing through both, must pass through the summit of the wheel. It follows that each bucket must, during the entire revolution of the wheel, radiate from a fixed point at the summit thereof.

Fig. 1 shows a sectional elevation of the wheel, and Fig. 2 a cross sectional elevation of the same; Fig. 3 is a perspective view of one of the buckets, showing clearly its grooved end. A A represent the wheel rims or side frames proper, in which the buckets, B, are supported by their axial bearings, b . C represents the feathering side frame revolving on an eccentric trunnion, C, and driven from the adjacent wheel frame by the connecting links, D, so that both frames revolve with equal angular velocity.

This wheel, the patentee says, possesses great advantages over some of the central radial and feathering float wheels now in use; also over the screw propeller. As compared with a central radial wheel of equal size and dip, it avoids entirely the loss of

HAIGHT'S RADIATING PADDLE WHEEL.

cially adapted to sea-going steamers, the paddles of which, from various causes, are subject to great variations of dip. It is also especially adapted to war steamers, as by full immersion it is entirely protected from injury from the enemy's shot, and is claimed to be specially adapted to propelling canal boats. For this purpose it may be made of small diameter so as to occupy little room, and will fully meet the requirements of shallow water and the necessarily great variations of immersion.

The inventor, having business connections with a ship and boat building business and a machine shop, is prepared to contract for wheels of any dimensions or steam canal boats or steamboats of any size, with machinery complete.

This wheel is the invention of Edgar Haight, and was patented through the Scientific American Patent Agency, on Nov. 7, 1865; further information may be obtained by addressing him at his residence, Buffalo, N. Y.

OUR SHIP YARDS.

The shipbuilders are active now, and a walk through the yards will reveal many frames going up and keels being laid, where but a few weeks ago there was nothing but chips.

At the present time more steam vessels and fewer sailing vessels are being constructed than ever before. All the coasting trade is being done by screw steamers and a few side-wheel vessels, ranging from 800 to 1,500 tons, and the few sailing vessels building are small craft of no great burden.

The Pacific Mail Steamship Company have an immense fleet of magnificent ships. None finer or swifter are to be found on the globe, but they purpose adding to these several others, two, at least, to trade between California, Japan, and China.

These vessels are essentially the same as the *Constitution* and *Golden City*, now in service. They are building by William H. Webb, Esq., and Henry Steers.

They are to be 360 feet long and 50 feet beam, and are to be built of the best materials. The engines are building by the Novelty Iron Works, and are of the same patterns as the other ships named, viz: cylinder 105 inches diameter and 12 feet stroke.

not being needed, has laid alongside the dock, receiving her machinery. The lower hold presents a deep and darksome sight, and all is at present chaos. The parts generally—cylinders, condensers, guides, shafts, etc.—are in place, but the details, which always consume the most time, are far from perfect.

NEW SAFETY APPARATUS FOR LOWERING SHIPS' BOATS.

On Friday, February 2d, a large number of gentlemen connected with the merchant marine of this city, and also others representing foreign interests, witnessed a trial of a new apparatus for lowering boats from ships while under way.

The experiment was conducted on board the revenue cutter *Cuyahoga*, and was a complete success. At a given signal, a boat manned by a full crew was launched from the davits, and under way in a few seconds. The ship's way gives an impetus to the boat, and by putting the rudder over, it is steered off from the vessel, and is free to go in any direction. It is asserted that this apparatus can be used in all weathers, and is specially valuable in a heavy sea when the ship lurches, as the boat can be detached instantly instead of being unhooked prematurely or lifted at one end, as is sometimes the case. Many deaths have been caused from the defective block and fall arrangement commonly used.

Foreign patents are being taken out on the invention through the Scientific American Patent Agency. In a few weeks we shall be able to present our readers with an engraving of it.

How to Circulate a Newspaper.

Another new scientific newspaper has been issued in London, called *Engineering*. It is edited by Zerah Colburn, and is devoted to mechanical and scientific matters in general.

As an illustration of the way English manufacturers go into business, the publishers of the journal announce that sixty-five thousand copies have been printed of the first number, and that of these, *sixty thousand* have been taken by one firm alone. Mr. Colburn's paper promises to be an interesting and valuable record.