ENGINES OF THE "PURITAN" AND "DICTATOR."

These two magnificent vessels-of-war now fast approaching completion will certainly be unsurpassed in their speed and invulnerability. We do not suppose that twenty miles per hour will be got out of them, as is stated; but we do think that three-fourths of it is not too much to expect when their models and engines are considered. We have had an eye on the construction of the machinery for some time, and have taken great interest in it. The following details will be found of general interest:—The cylinders are 100 inches in diameter, and the piston has 4 feet stroke; they are "kettle bottomed," being cast solid, of the same shape as that utensil named; they are 2½ inches thick through the sides, and have 4 strong lugs by which they are held to their places. They stand vertically, and have no bed plates; in fact there are none for the whole engine, but the cylinders are bolted to two massive wrought-iron kelsons, 10 feet deep and some 24 inches or more in width; four huge bolts secure each cylinder to the kelsons. The cylinders are both in line, athwartships, and have large slide and expansion valves, the latter working over the former; in each valve there are two stems which proceed to strong cross-heads working between vertical guides on the end of the steam chests. The chests are bolted, not cast to the cylinders.

A peculiar feature of this machinery is the absence of guides, cross-heads, and other cumbrous parts. The piston has a trunk attached to it, but the engines are not, strictly speaking, trunk engines. The usual connection is attached to the bottom of the piston, runs up the trunk, and takes the end of a lever attached to a vibrating shaft running fore and aft; this shaft transmits the power of the piston to the propeller or screw shaft; it is supported in wrought-iron blocks, with brasses, as usual, and has a vertical lever placed on it, from which the main connecting rod proceeds directly to the crank pin; these are the principal parts. The vibrating shaft blocks are bolted to the kelsons (of which there are six in all), and there is one shaft to each cylinder, making two shafts, two connecting rods, and two trunks between the pistons and the crank pin. The air-pump is placed inside the condenser, and worked by a lever on the end of the vibrating shaft. The condenser is of the old-fashioned jet variety, and sits directly aft the cylinders. The shaft is 21 inches in diameter, is 72 feet long in several sections, and works in a tunnel or alley way made for it.

The boilers have 56 furnaces, and an aggregate grate surface of 1,100 feet; allowing 12 pounds of coal per square foot of grate surface, the vessel will require at the least 175 tuns of coal per day, of 24 hours steaming at full speed.

These engines are precisely similar in all respects for each vessel; the propeller is 21 feet 6 inches in diameter, has 32 feet pitch, and weighs 39,000 pounds; there is no out-board bearing for the shaft. What piston speed will be obtained from the engines remains to be seen; we hope that the highest expectations of the builders, and the designer, Captain John Ericcson, will be attained.

COATING IRON, WHITE COPPER, AND BRASS.

Articles made of wrought-iron soon become rusty when exposed to a moist atmosphere, owing to the affinity which the metal has for oxygen. Cast-iron contains more carbon than wrought-iron, and is not so liable to corrosion; nevertheless all articles of cast-iron require to be coated with some substance to protect them from rusting. Copper exposed to the atmosphere, or to water, resists corrosion in a superior manner; hence it has been sought to coat iron with a thin skin of copper. Articles of cast and wrought-iron may be coated with copper by two modes; namely, dipping in molten copper; and by electro-deposition. The most simple method of electro-deposition is executed without a galvanic battery, and the process is quite old. It consists in making the surface of the iron bright, by scouring or otherwise; then dipping into a strong solution of moderately warm blue vitriol (sulphate of copper). By electrical affinity, a small quantity of pure copper is deposited from the solution, on the surface of the iron, in a thin coat. The articles should be quickly removed from the solution, washed in soft warm water, and dried in sawdust. The copper thus deposited on cast and wrought-iron articles, is liable to become black on the surface afterward by the formation of oxide; and the copper also wears off rapidly, because it is so thin. However, by dipping them into varnish, then drying them, the surface will be protected from the atmosphere. It would cost too much to turn or file cheap cast iron articles, to prepare them for being coated with copper; but they may have their oxide removed entirely by agitation in warm dilute sulphuric acid, at the rate of 1 pound of acid to 10 of water; after which they may be scoured by agitating them with sand and water in a barrel-like vessel rotated on journals. But in addition to the simple deposit of the copper solution without a battery as described, a thicker deposit of copper will be secured by using a battery in the common way in which copper is deposited as in electro-plating.

Another method of coating iron with copper is by dipping it into fused metal. In all such operations the iron must first be cleansed and perfectly freed from oxide, scouring with sulphuric acid being the cheapest method of effecting this object. The clean iron is first immersed in a bath of the stannate of soda for a few minutes; which is made by dissolving one pound of the stannate (tin dissolved by soda and forming a white salt) in one gallon of water; then taken out, dried, and drawn slowly through molten copper contained in a crucible. Another method consists in dipping the clean iron articles in a bath of the muriate of zinc and tin (tin and zinc dissolved and saturated in muriatic acid), at the rate of one pint of the muriate to five of water; then taken out, dried, and dipped in the molten copper as already described. Instead of copper, brass and German silver may be the molten metals employed to coat the iron; the same process will answer for all these metals. In each case, the surface of the molten metal in the crucible or melting pot should be covered with borax in powder, and some ground glass. When the articles lifted out of the molten copper have become cold, they assume a blackish appearance from the absorption of oxygen. This is removed by dipping them into dilute muriatic acid, then washing in warm water, and drying in sawdust. Iron nails, and other small articles may thus be coated with copper, brass, or German silver. In all attempts hitherto made to coat iron with a thick coat of copper or brass, some medium between the iron and copper seems to be necessary. Tin or zinc will answer; hence the use of the solutions of tin and zinc described, to prepare the iron for receiving the copper. In coating iron with brass, the common method is to give the iron a coat of tin first.

An Absurdity.

"Every kind of artificer can be found in Gen. Grant's army, and their skilled labor is called into frequent operation. An ample supply of rolling stock for the railroad from Vicksburg to Big Black has been improvised by them. The trucks were cast, and the remainder of the engines gathered from the debris of destroyed engines by piecemeal. Part came from the Tennessee roads, part from Kentucky, and other parts from Mississippi. From such materials were made good, neat, and strong locomotives in a very few days."

[This is very good for a paragraph, but it happens to be an impossibility. No such thing could occur. Engines have to be made with great care, and to say that pieces taken from different machines 500 miles from each other would fit accurately, is paying a compliment to machinists which though flattering is impossible. Cases may occur where one piece of machinery will fit an engine it was not made for; but these are extremely rare, and do not occur once in a lifetime.—Eds.

Wool Abroad.—During the first seven months of the present year, as we learn from late English exchanges, 93,608,625 lbs. of wool were imported into England, against 86,652,325 lbs. in the same period last year. Most of this wool came from British possessions abroad, Australia alone furnishing 44,311,317 lbs. Of the above amount 8,518,040 lbs., were exported to the United States, besides 572,340 lbs. of English grown wool.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Horse Shoe.—This invention consists in applying vulcanized india-rubber to a horse shoe, in such manner that a firm connection of the rubber to the shoe is obtained, and the feet of the horse prevented from clogging up with snow or "balling," as it is technically termed, and the feet also prevented from slipping; while the feet are prevented from being subjected to the jars and concussions which are the fruitful source of disease in horses, especially if driven over pavements in cities. The above improvement is the invention of O. A. Howe, of Fort Plain, N. Y., and the patent bears date Sept. 15, 1863.

Railroad Car Brake.—This invention consists in a novel means employed for operating the brakes of a series or train of cars; the several parts being so arranged that, by actuating a single lever on the engine or locomotive, all the brakes may be applied simultaneously or nearly so, thereby avoiding the necessity of a plurality of brakesmen, and placing the whole power of the brakes and the manipulation thereof under the control of the engineer. The above improvement is the invention of Augustine Irel Ambler, of Chicago, Ill.

Surgical Splints.—This invention consists in a surgical splint, stamped or otherwise produced, of sheet metal instead of wood, said metal being provided with a series of perforations so that secretions or lotions which may come in contact with the splint will evaporate quickly, thus avoiding the necessity of frequent changes of the wadding, and producing by the evaporation itself a beneficial cooling effect on the limb. The metal is protected against oxidation by Japan varnish, and it is strengthened by curves or beads. This splint, according to the occasion for which it is to be used, is also provided with a peculiar device for the purpose of adjusting the same to the axis of the joints of a limb, and the foot-plate is set upon springs and provided with hinged screws which allow of adjusting the same to the desired position of the foot. The above improvement is the invention of Charles Wittmann, of Brooklyn, N. Y.

Quoins and Furniture for Locking up Forms of Type.—This invention consists in the construction of the quoins in the form of rollers, with surrounding recessed teeth or cogs, and the furniture with racks or series of teeth or cogs to gear with the said teeth or cogs on the quoins, such quoins being applied to roll between the furniture and the chase or between the two sticks of furniture, and being turned with a key to move them from a wider to a narrower portion of the paper space between the furniture and the chase or between the pieces of furniture, and thereby made to tighten up the type in the page or pages and tighten up the page or pages in the chase. R. Hoe & Co., of New York are the assignees of this patent. The above improvement is the invention of Hippolyte A. Marinoni and Francois N. Chandré, of Paris, France.

Means of Directing Motion in Right Lines.—There are many instances in machinery in which the direct application of fixed guides to a body, which is what is termed "parallel motion" has been used, but this does not produce a perfect rectilinear movement. The object of this invention is to obviate the imperfection of the "parallel motion," and to obtain a perfect rectilinear movement of a body without the application of fixed guides directly to it; and to this end it consists in the combination of one or more oscillating and longitudinal moving arms by means of an attached slide or roller with a fixed arc or curved surface, whereby a certain point in the said arm or arms is caused in its oscillation to describe a right line and to produce a rectilinear movement of any body that is attached to it at that point. The above invention is due to Andrew Buchanan, of Jersey City, N. J.

Joint for the Tubes of Surface Condensers.—The principal object of this invention is to provide for the removal of any one of the tubes of a condenser for repair or any other purpose without disturbing the others, and at the same time to provide for the free longitudinal expansion of the tubes, and to this end it consists in forming the joint between a tube

and tube sheet by means of a thimble passing over the end of the tube and screwing into the tube sheet, and a ring or gasket of india-rubber or other packing material which is inserted into a cavity in the sheet and compressed around the tube by means of the thimble, in such manner as to make a steam-tight joint, but freely permit the longitudinal expansion of the tube. It also consists in the construction of such thimbles with their openings of circular form at their inner ends for the reception of the tubes, but square or other polygonal form at their outer ends for the reception of a wrench or key by which to screw them into their places. Measures have been taken to secure an English patent for this invention. The above improvement is the invention of John V. V. Booraem, of Jersey City, N. J.

Mold for Casting Printer's Type.—This invention relates to molds for casting type either singly or several at a time from any material, more especially type made of a mineral composition which is in a plastic but not a fluid state at the time of molding. It consists first, in certain constructions of the mold whereby facility is afforded for detaching the type from them; second, in certain means of insuring the registering of the molds with the matrices; and third, in a certain mode of applying a receiver for the material of which the type are to be made, a plunger for pressing the material into the molds, and a cut-off for separating the molds from the receiver, in combination with each other and with the mold box, whereby great facility is afforded for casting the types, and for removing them from the mold after casting. The above improvement is the invention of R. W. Davis and D. Davis, of the City of New York.

Device for Gilding Moldings.—This invention consists in the employment of a tip or brush applied to an arm which is attached to or connected with a slide and has a spring bearing against it; all being arranged in such a manner that the operator can, with the greatest facility, remove or take up the metal leaf from the book or pile and deposit it upon the molding. The invention also consists in using, in connection with the tip or brush arranged as above specified, an endless apron arranged to operate conjointly with the brush slide, in such a manner as to admit of the leaf, when applied to narrow moldings, being cut by the operator into strips of a width to suit the moldings. The invention further consists in a means employed for feeding the molding to the brush, the feed mechanism being arranged to operate conjointly and automatically with the brush and endless apron. The above improvement is the invention of Robert J. Marcher, of New York City.

Applying Power to Car Brakes.—This invention relates to an improved mode of applying the power to that class of car brakes which are actuated from the locomotive, and it consists in the employment of a friction wheel applied to an adjustable shaft having a screw upon it, which by actuating said shaft, may be thrown in gear with a worm wheel on a shaft having a loose drum upon it and connected with the shaft by means of a spring pressing one end of the drum in contact with a conical hub attached to the worm wheel; all being arranged in such manner that the brakes of a train of cars will be in complete control of the operator or engineer. The above improvement is the invention of A. I. Ambler, of Chicago, Ill.

Instrument for Taking Soundings.—The object of this invention is that of taking soundings from vessels navigating shallow waters without stopping or checking the speed of such vessels. The principle is of a self-acting nature, the depth of water being at all times shown by a self-adjusting index. It is a well-known fact that there is a certain fixed relation between the pressure and the depth of water, and that, therefore, if the pressure of the sea at a certain point below the surface be known, that pressure accurately indicates the depth. This invention is founded on these physical facts. An elastic air-tight bag is inclosed in a small metallic vessel attached to a tow line secured to the vessel. An india-rubber tube is connected with the bag by an air tight joint. This tube is lashed to the said tow-line with its upper end put in communication with an ordinary pressure gage. This pressure gage is graduated in such a manner that its divisions correspond with the pressure produced by one foot column of water. The index of the gage, therefore, in place of showing as usual the number of pounds of pressure to which it is subjected, will show what column of water corresponds with the pressure within the gage. In other words, the index will show how far the instrument is immersed below the surface of the water. Thus, by mere inspection the depth of water may at all times be accurately ascertained, without the inconvenient and inaccurate process of heaving the lead as hitherto. The above improvement is the invention of John Ericsson, of the City of New York.

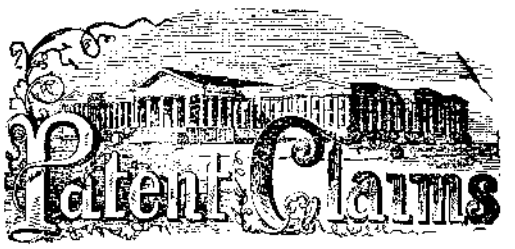
Mode of Applying Brakes to Cotton Lappers, &c.—In lappers and breaker cards and other machines for condensing a number of sheets of cotton or fibrous material into one sheet or lap, a friction brake is employed to produce the necessary pressure on the roll around which the lap is wound, to give the lap the required degree of compression; and this brake requires to be thrown out of operation when the lap has attained its full size and is ready to be taken out and to remain inoperative while the full lap roll is being removed and a fresh one substituted, and be brought again into operation on the starting of the machine to commence the formation of a new lap. The brake is usually kept in operation by means of a weight attached to a foot lever or treadle, and when it requires to be thrown out of operation the attendant has to press his foot on a treadle to raise the weight, and this pressure has to be continued to keep the brake inoperative while the roll is being changed. The object of this invention is to render the brake automatic, and to this end it consists in combining it with the shipper or other device which stops and starts the feed rolls of the machine in such manner that it is thrown into operation by the act of starting the feed rolls and out of operation by the act of stopping the said rolls.

Machinery for Preparing Cotton &c.—In preparing laps for carding, some attempts have been made to combine an opener and a cleaning trunk with a lap-head for the purpose of forming what is known as a breaker lap, but such combination has never been made to operate with perfect success, owing to the difficulty of combining a suitable number of draft cylinders at the mouth of the trunk to prevent excessive back pressure on the opener and in the trunk, such pressure causing the fiber to be badly curled and to come out in bunches. It has been common, in connection with such combinations, to use a blow-fan on the opener to drive the cotton through, but this tends to pack the fiber in the trunk and cause it to become choked up. This invention consists in a certain arrangement of an endless apron in combination with the draft cylinders, as hereinafter described, at the mouth of the trunk, whereby the use of three or more of such cylinders is permitted instead of only two, which is the greatest number it has hitherto been practicable to use. The above improvements are the invention of Richard Kitson, of Lowell, Mass.

NEW PROTECTION FOR STEAM BOILERS.—Compressed hair or hogs' bristle is now being placed about the steam drums of such vessels in the navy as have their boilers exposed. Experiments prove that this substance possesses great power of resisting shot. As compared with cotton, it is far superior. A hundred pound rifle-shot was fired in the Washington Navy Yard at a bale of cotton about 80 yards from the gun; it penetrated and passed out the other side to a long distance; the same shot fired at a bale of compressed bristles, penetrated and dropped out 16 inches from the other side, showing the power of the projectile to be wholly spent. This is a patented article.

This paragraph was written before the report on this article was received from the Ordnance Department. There would seem to be some discrepancy between them.

INTERESTING AND VALUABLE REPORTS.—By favor of the Ordnance Department we have been provided with reports of recent experiments tried at the Washington navy yard, on certain targets, guns and projectiles, brought thither for inspection by officers of the Government. Two such reports will be found on page 238 of the present number. Fuller details will be found by perusing the report. We hope to make these articles, in future, a special and interesting feature of the SCIENTIFIC AMERICAN.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 22, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

40,005.—Car Brake.—A. I. Ambler, Chicago, Ill.:

I claim the screw, I, and a worm wheel, J, the latter being place on a shaft, K, working or rotating in fixed bearings, and the screw placed on a shaft, D, having a swinging or adjustable bearing, the above parts being arranged substantially as shown, and used in combination with a friction wheel, H, placed on the shaft, D, and arranged relatively with a flange, d′, of a wheel, C, of a locomotive, to operate as and for the purpose herein set forth.

I further claim, in combination with the screw, I, worm wheel, J, and friction wheel, H, arranged as shown, the spring, M, and drum, L, applied to the shaft, K, as and for the purpose specified.

40,006.—Pump.—C. C. Alexander, Denver, Colorado:

I claim the peculiar arrangement of the cylinder to a reservoir by means of the pipes; fastened to a cylinder head and to a check valve seat, substantially as hereinbefore described.

40,007.—Railroad Car Brake.—A. I. Ambler, Chicago, Ill.:

I claim, first, The frictional clutch, G, placed on the axle of the tender or engine and actuated through the medium of the levers, A F, and rod, E, in connection with the chain, I, lever, K, and bar, N, the latter being provided with the shoe, k, and all arranged as shown, to operate as and for the purpose set forth

Second, The shaft, O, with pulley, Q, in connection with the pulley, T, on the axle, U, the pendent arm, m, with rod, P, attached and connected with the chain, E′, through the medium of the pulleys, p g, arranged as shown, or in any equivalent way, to operate as and for the purpose set forth.

Third, The connecting of the drum, R, on the shaft, O, with the pulley, Q, on said shaft, by means of a spring, S, arranged with nuts, s, substantially as shown, for the purpose of limiting the tension of the chain, u, and the power of the brakes, as set forth.

Fourth, The combination and arrangement of the clutch, G, chain, I, lever, K, chain, E′, shaft, O, with pulley, Q, attached, the pulley, T, on the axle, U, drum, R, on shaft, O, connected therewith by a clutch and spring, the chain, u, attached to drum, R, and applied to the brakes, all in the manner substantially as and for the purpose specified.

40,008.—Rotary Pump.—C. L. Adancourt, Troy, N. Y.:

I claim the arrangement of the packing pieces, C and H, with rounded stems to fit into sockets, b or j, substantially in the manner and for the purpose herein described.

I also claim the combination of the grooved flanges, d, with the sliders, F, and piston, D, substantially as and for the purpose described.

[This invention consists in the arrangement of a rounded stem on the back of the packing pieces, in combination with correspondingly rounded sockets, in the face of the stationary abutment in the cylinder and in the faces of the sliders in the rotary piston, in such a manner that the action of the water itself keeps said packing pieces tight.

40,009.—Feathering Paddle Wheel.—Alvaro Buttrick, Chelsea, Vt.:

I claim the arrangement of the spiral-faced movable self-adjusting hub, B, spindles, F, and floats, E, with the spiral clutches, H H′, cams, G, and guides, I I′, all operating in the manner herein shown and described.

[This invention relates to that class of feathering paddle wheels the floats of which are arranged to turn about axes perpendicular or nearly so, to the axis of the shaft of the wheel for the purpose of presenting the blades flatwise to the water during a portion of each revolution of the wheel, and edgewise during the remainder of the revolution. It consists in certain improved means of producing the above-mentioned feathering movement, which is operative in whichever direction the wheel rotates, and which varies the said movement to suit the reversal of the rotation of the wheel.]

40,010.—Shears and Scissors.—Joel Bryant, Brooklyn, N. Y. Ante-dated July 29, 1863:

I claim the construction and exclusive use of shears and scissors, S, figures 1 and 2, when made with curved blades, A and B, and with their rivets, R, set on a line with the curve of the said blades, A and B, substantially as herein described and for the purposes as herein set forth.

40,011.—Construction of Fly Wheels.—Joel Bryant, Brooklyn, N. Y. Ante-dated June 9, 1862:

I claim the within-described mode of using fly-wheels, W, in connection with portable or other machines, M, figures 1, 2, 4 and 6, when the said fly-wheels, W, are set to run within or beneath the base, B, of said machines, M, on anti-friction roller bearings, G, or their equivalent, substantially as herein described and for the purposes set forth.

40,012.—Monochord Tuning Instrument.—E. D. Bootman, Edmeston, N. Y.:

I claim the movable bridge bearing or stop, composed of two pieces of steel or other metal, J K, as described, in combination with the mortises, e e, in the sound board, substantially as and for the purpose herein set forth.

[The principal object of this instrument is to enable those who play the pianoforte to tune their own instruments. It is composed of a single string or monochord arranged over a sound board in a suitable case, and a bridge, bearing or stop which is movable upon the sound board to stop the string at the point to make it produce a requisite note. The improvement consists in a very simple and effective construction of the said movable bridge, bearing a stop and mode of applying the same to the sound board.]

40,013.—Joints for Tubes of Surface Condensers.—J. V. V. Booraem, Jersey City, N. J.:

I claim forming the joint between the tube and tube sheet by means of a packing, a, of india rubber or other suitable material surrounding the tube, and a hollow screwed thimble passing over the tube and screwing into the tube sheet, substantially as herein specified.

40,014.—Application of Blowers to the Furnaces of Locomotives.—F. B. Blanchard, New York City:

I claim combining the fan shaft of the blower with the driving or other wheel of the locomotive, by means of cranks, f f and d d, rods, e e, a shaft, D, gears, g g′, pinions, h h′, and clutches, i j and i′ j′, the whole applied and operating substantially as and for the purpose herein specified.

[This invention relates to the driving of the blower by gearing from the driving or other axle of the locomotive to effect combustion in a