

double, to serve the purpose of a reservoir for holding some lime, charcoal, and ice. The former is placed beneath the bed, so that the currents of cold air near the floor are made to pass over it, when the moisture and carbonic acid are absorbed. By this means the air is warmed and rises through a charcoal filter, when if required during the summer season, it passes over ice, finally emerging through an opening directly over the pillow. The effect of this constant current of pure air, is first, that more of it is taken into the lungs, and thereby the whole system is stimulated and the health improved. A pamphlet before us explains further why there is no danger of taking cold, and why sleeping in pure air tends to protect from diseases resulting from exposure during the day, the testimony on this point, as well as to the merits of the apparatus, being that of many eminent physicians of this city.

Several ingenious combinations of household conveniences, useful when economy of room is a desideratum, are shown, explained, and operated by their respective inventors. Brewster's ironing board, hat rack, table, and closet; Mc-More's writing desk and table; Phelan's combined dining and billiard table; Bennett's table-bed, and combined seat, sofa, bed, sick chair, and rocking chair; these all have such expressive titles that further notice is unnecessary. Luckow & Nachtheim's circular extension table is in form the segment of a circle; thereby, it is claimed, it will seat a larger number of people in a smaller space than the old-style long table. The conversational element in a party dining at one of these tables must of necessity be somewhat limited, as fully one half of the company sit *dos à dos*. The table is made of ten parts, which may be separated and a small center or ordinary dining table can be made.

The adjusting and folding chairs made by Chas. C. Schmitt are advertised as the most elegant chairs manufactured, and from an inspection we are inclined to admit the claim. The upholstery is elegant and the form of construction affords the greatest comfort to the body.

The constant jingling of a bell invites public attention to E. Holmes' burglar alarm telegraph, which is so arranged that the opening of a window or door when the apparatus is set, completes a magnetic circuit, and an alarm is sounded, much to the discomfort of the baffled intruders. Webb's Universal Protector subserves a like purpose, but in a different way. Dispensing with a battery, in this arrangement a gong bell over the door or window has a train of clockwork within it, which when wound up is set off by inserting a key in the lock of the one, or attempting to raise the other.

Brown's carpet stretcher and tack-driver is an instrument by which the operator can stretch and tack down a carpet at the same time, and with as little effort as the subsequent sweeping of the same may be accomplished. The American paper mache manufacturing company have an assortment of pails, basins, toilet sets, milk pans, spittoons, etc., all made of chemically prepared paper, yet which are impervious to the action of water and acids. These articles may be placed in an oven until water will boil in them, without injury; and, furthermore, they will not break, shrink, water soak, rust, or fall to pieces. The manufactory of this company is situated at Greenpoint, L. I.

PUMPS, MACHINERY, TOOLS, ETC.

There is quite a collection of power and hand pumps in the exhibition, all of them worthy of attention and some of them possessing merits so obvious that the mechanic cannot overlook them. The Metropolitan Rotary Engine Co. exhibit a very powerful pump, which delivers a beautiful round stream. It is a rotary pump very compact and quite simple in its internal construction. The builders claim that it will maintain a vacuum of twenty-eight inches, and during a trial of seventy-two consecutive hours a constant vacuum of twenty-nine and a-half inches was maintained. It seems to be well designed for durability as well as efficiency; it certainly appears to be as durable as any rotary pump can be expected to be.

The steam pumps exhibited by the Niagara Steam Pump Works, 9 Adams St. Brooklyn, N. Y., are excellent hydraulic machines. One style has the piston rod of the steam cylinder in common with that of the pump chamber—the machine being horizontal. Another has a crank, and the engine and pump can be readily disconnected so that the former may be used to drive any machinery.

Messrs Terwilliger & Co. exhibit some of their welded steel and iron burglar-proof safes. They are composed of a series of plates made of steel and iron welded, the steel outward, secured by conical bolts running through and through. Each plate is separately held, so that if one is forced off, the remainder are not thereby weakened. We venture to say that it would be impossible to throw open the side of one of these safes in twenty-nine minutes if operated upon in the same ridiculous manner as were those at the Paris Exposition.

Dion's Fire Detector is intended to give an alarm of fire instantly. It does not depend upon magnetism or electricity, but its parts are absolutely connected, and it is governed wholly, in its action, by the variation of the common thermometer. Its principle and operation appear to be faultless. The office is at 80 Cedar st., N. Y. Ward's Dish Washer and Dryer is a portable tank for holding hot water, having a shaft running longitudinally through it on which are two disk brushes of wood for washing, and two similar disks faced with sponge for drying. It does its work with dispatch and thoroughly.

Fuller's Tuck Creaser, attached to a Wheeler & Wilson sewing machine in the north gallery, is a device which seems to be a great attraction, especially to lady visitors. It can be attached to any of the sewing machines in use and is intended to fold or crease the fabric to be sewed into plaits. For shirt bosoms and skirts it is just the thing. The operator has only to guide the cloth when the plaits will be laid narrow or wide,

according to an adjustable gauge, and securely held by stitching.

We notice two knitting machines, the Bridgeport, Conn., machine and the Hinkley machine made at Bath, Me. The former knits a tube, the dimensions of which—or the "narrowing and widening"—are governed by the removal or insertion of needles by the operator. It is very compact and quite simple. But we think for simplicity and actual usefulness persons interested in such machinery should examine the Hinkley machine. An illustrated description of the latter will soon appear in these columns.

Next to the card machine—which we have not room to notice this week—there is no machine which deserves the attention of visitors more than Clark's Spooling Machine. It is certainly a curiosity. The empty spools—those on which the sewing thread is wound when purchased from the stores—are placed in a movable hopper, and when one is filled, which is done with great rapidity, another empty spool is automatically raised to a position where the spindles engage with it, and the end of the thread is instantly passed into a slit in the head of the spool, when the thread is rapidly wound in concentric layers up to the top of the heads. This done, the filled spool drops instantly out of the way, the thread being cut and fastened into the slit in the head, when the machine is ready for another spool.

Cory's Angular Bit-stock is a device for boring holes in places impossible to be reached by the ordinary auger, and preferable to the "universal joint" bit-stock so generally used. Gas fitters, plumbers, and carpenters should examine this useful tool.

Notwithstanding the excellent good management of the fair we have to record two serious accidents. A mechanic named P. McGowan while attempting to remove a cent from the anvil of the Goulding & Cheeney's drop hammer had his hand smashed by the descending hammer and amputation was found necessary. He has a family, and a subscription for his relief has been started. Visitors at the fair may hand their contributions to manager Hicks or chief engineer McElroy.

On Thursday the 10th, Dean Linnell, the engineer of the Babcock & Wilcox engine, fell into the fly wheel, and after being whirled several times around, was thrown with great violence on the Getty pump, breaking off the air chamber, of cast iron. His collar bone was broken and it is feared he was much injured internally. He has a wife and child in Providence, R. I.

The fair will close Oct. 26th, and those who feel interested in the mechanic art should embrace the opportunity to witness one of the best exhibitions ever seen in this country.

ISHERWOOD'S COG-WHEEL PROPELLER ENGINE--AN INTERESTING COMPARISON.

Several of the British built screw propeller steamers, as is well known, frequently make passages both ways across the North Atlantic at the average rate of 14 knots (of 6,086 feet) per hour. These vessels are of about the same size as the *Wampanoag* class of screw steamers built by the Navy Department with machinery planned by the Chief of the Bureau of Steam Engineering. Hence a comparison between these vessels with respect to their speed cannot fail to be interesting. Let us take the screw steamer *Periere* engined by Napier of Glasgow, which has made so many rapid runs; the immersed midship section of this vessel is nearly the same as that of the *Wampanoag*, and as to the models it is pretty certain that the latter is considerably the best, as one of our most skillful naval constructors, Mr. Delano, "spread himself," as the saying is, in modelling this ship. The *Periere* has more than once steamed across the Atlantic at the rate of 14 knots and when put on her mettle has easily attained in "smooth water uninfluenced by wind or tide" 15 knots. According to Mr. Isherwood's official report he contrived the steam machinery of the *Wampanoag* to give her "a maximum speed of 15 knots per hour."

The engines of the *Periere* are direct acting and the whole of her steam machinery weighs only some 650 tons including the boilers, while Mr. Isherwood's machinery in the *Wampanoag* class weighs some 1,200 tons. This immense difference shows how little practical knowledge the Steam Department of the Navy possesses on the important subject of marine engineering.

In this case, throwing aside for the present the improper proportion of the details, this enormous difference in weight may be, for the most part, accounted for by the fact that the Chief of the Bureau of Steam Engineering, in spite of the remonstrances of the most distinguished engineers in the country used an inferior boiler known as "Martin's patent" (employed only in the U. S. Navy), and also interposed between the engines and the propeller eighteen cog wheels of immense size and weight.

It seems that the scores of direct-acting engines heretofore contrived by this officer for the Navy, had given such wretched results that it is attempted in this case to achieve success by cramming a sharp vessel with that exploded engineering makeshift a "cog wheel" or "geared" screw engine. The plan of connecting the engine to the propeller by means of cog wheels is not so very objectionable on a smaller scale; but when this device is applied to engines working up to the great power these engines are required to develop in order to give the stipulated speed to the vessel, the weights, the space and the complication are so greatly increased and practical difficulties of such a formidable character are entailed by the use of cog wheels, of such proportions as these, that no one with adequate engineering judgment would entertain the idea of using them after he had scrutinized the subject.

We sincerely hope, as the *Wampanoag* is the pioneer of four more of the same kind, that she may be a great success in

point of sustained high speed; for failing in this point they will be practically worthless as war vessels.

Of course, the further a comparison is pushed between such machines as the engines of the *Periere*, etc., and those of the *Wampanoag* the more strongly is the want of engineering skill and common sense on the part of the designer of the steam machinery of the latter made manifest.

For instance the *Wampanoag* is so loaded with boilers, smoke pipes and "cog wheel" engines that she cannot carry near coal enough in her bunkers to cross the Atlantic at top speed, as is constantly done by many screw vessels—such as the *Periere*. And so much space is filled with machinery on the *Wampanoag*, that a large portion, of even the small amount of coal she can stow, is carried in bunkers built on the deck in the quarters of the crew, instead of in the hold, as is the case with the other vessels we have alluded to. Yet, as we have seen, although such an immense space in the *Wampanoag* is devoted to machinery, and bunkers are built in the quarters of the men, she is unable to carry coal enough to cross the Atlantic at such speed as it is frequently crossed by working vessels of much less pretensions and with only one pipe. It is only by running at low speed and practicing economy that such a voyage could be made under steam.

We think that this fact alone is sufficient to stamp the steam machinery of the vessel as a blunder without parallel, of its kind.

And finally to make the matter still worse it should be remembered that the *Wampanoag's* engines are so tied up by the proportions of the cog wheels that when they are working to their full power they must be operated in accordance with the "seven-tenths cut-off theory" as laid down in the Steam Blue Books of the Navy Department. In other words the pistons move at so low a speed that the steam must follow them at least seven-tenths of stroke, in order that they can work off the steam from her twelve boilers.

While the other vessels to which allusion has been made are worked with an independent cut-off the *Wampanoag* must work practically "non expansively."

Hence this highly improper distribution of steam, for engines of this magnitude, decreases still further the power of the already inadequate supply of fuel.

Delicious Coffee.

One of the most delightful features of a breakfast is good coffee. Broiled chickens, Spanish mackerel, fresh eggs, and light rolls make a good breakfast, but the flavor of all these edibles may be spoiled by a cup of poor coffee. We have recently had in use a new coffee pot called the "Aroma Condenser," invented by N. Holtz, of Greenpoint, L. I., which has given the most perfect satisfaction to our household.

The means by which the desirable property of a good cup of coffee is attained are very simple. A coiled pipe, similar to the worm pipe of a still, leads from the vessel containing the coffee into a chamber above, into which cold water is poured after the coffee commences to boil. The steam rising into the coiled pipe is thus condensed, and the water with the aroma which in common coffee pots is allowed to escape, is conveyed back into the vessel containing the coffee. The same plan of a pot is said to be equally adapted to making tea.

Probable Uses of the Telegraph.

An exchange asks: Why should not every house have its telegraphic wire? When gas was first applied to purposes of illumination, it was used only in the public buildings and streets, and even now on the continent of Europe it has been introduced but sparingly into private dwellings. Why may not the telegraph wire be extended and diffused—if we may say so—as the gas pipe has been. Suppose a network of such wires laid from a central point in the city to the library or sitting room of every dwelling, and an arrangement made for collecting news similar to that controlled by the associated press. Through the wires, then, this news might be instantly communicated to each family, without the work of time rendered necessary to put it into type, print it, and distribute it by means of carriers. A fire, a murder, a riot, the result of an election, would be simultaneously known in every part of the city. Of course, this would do away with newspapers, but what of that? All things have their day, and why should such ephemeral things as newspapers be an exception to the rule?

Boring Rock With an Eight Tun Drill.

In No. XIV., current volume, page 215, we made, in our column of Manufacturing, Mining, and Railroad Items, a notice of the performances of a rock-drilling machine, which, it was said by "the papers," sunk four feet into the solid rock at every blow. The work was being performed at the Keokuk Rapids, on the Mississippi, in Rock Island county, Ill. In reply to our desire to know the structure of rock which could be thus penetrated by a single blow, a correspondent, A. C. S., of Sabula, Jackson county, Iowa, sends us the following statement:—"A fine-grained, compact, and homogenous rock, exhibiting but little trace of crystalline structure until examined under the microscope, when it shows a conchoidal fracture. It is somewhat soft, but grows harder after exposure to the atmosphere. He says it is believed by some that the contemplated improvement in the navigation of the river will prove a failure."

PRESERVATION OF ANATOMICAL SUBJECTS.—The object which is to be preserved is dipped in a mixture formed by adding to seven parts glycerin, one part brown sugar and half a part niter, until a slight deposit begins to be perceived on the bottom of the vessel. Putrefaction is thus entirely prevented, the object when taken from the solution being perfectly rigid, but by hanging it in a warm and dry place, the muscles and articulations will recover all their pliancy.