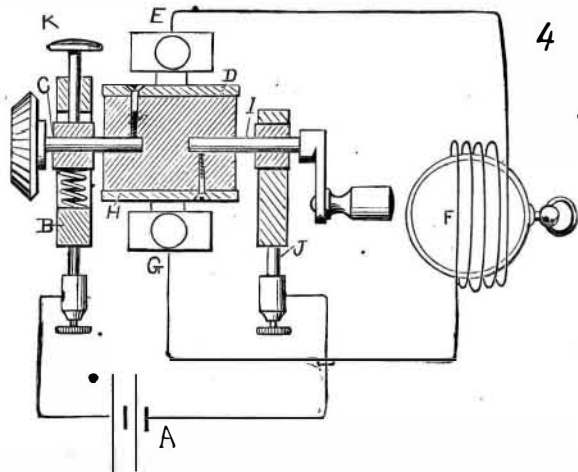


THE DEMAGNETIZATION OF WATCHES. (Continued from first page.)

as the zincs are withdrawn. The connection between the battery and the standards, B, J, is made by means of spirals to permit of the free movement of the battery plates. The binding posts attached to the commutator springs are connected by wires, A, B, with a coil like that shown in Fig. 1.



ELECTRICAL CONNECTIONS OF THE DEMAGNETIZING MACHINE.

If the first treatment of a watch does not entirely demagnetize it, the operation should be repeated without plunging the battery plates deeply.

Protection of War Ships with Rubber.

The experiment which lately took place with the *Resistance* at Portsmouth is important, and deserves notice. The necessity for thickening armor in order to meet the rapidly increasing power of ordnance led to the consideration as to what parts of the ship might be left without armor without actual danger to her existence or efficiency as a fighting machine. Hence certain portions, such as the water line amidships, the magazines, engines, sufficient hull to secure the vessel remaining afloat, and principal guns have been included in the category of so-called vital parts, and have been protected by vertical or horizontal armor, while other portions have been allowed to take their chance with thin armor, or nothing more than the thin steel or iron side of the ship. This system of construction, says the *Engineer*, led to the development of quick fire attack, carried on by guns loaded by hand, but supplied with fixed ammunition, that is, ammunition in which charge, projectile, and cap were contained in a single metal case, as in small arm cartridges. By this means, coupled with arrangements for bringing the gun back into position after recoil, 6 pounder and 3 pounder guns can be fired very rapidly. In fact, a rate of seventeen rounds a minute without aiming, or twelve rounds taking aim, can be maintained for some time; consequently, unarmored or slightly armored parts of a ship may be cut away at a rate which endangers her safety. For while a few rounds even from large guns might not cause intolerable inconvenience, the destruction of the sides by quick fire, which might be applied to nibble the structure rapidly away just at the most important parts, might, it is thought, quickly endanger the ship or reduce her to impotency by hampering her movements. Large holes, well forward and near the water line, for example, would cause water to enter freely when the ship moved quickly. This, at all events, has been strongly urged. Captain Fitzgerald, in a paper read at the United Service Institution on January 21, 1885, argued that the *Hercules* by this means could disable the much more formidably armed and more modern *Italia* before the latter could fire her four 100 ton guns more than once. Captain Fitzgerald, we believe, has subsequently advocated strongly the employment of India rubber for unprotected parts of ships. Preliminary experiments appeared to show that a thick sheet of India rubber would close up after a machine gun or even a quick fire gun bullet had passed through it, so as to prevent the entrance of water. Asbestos and cork have been similarly used under the appellation of contrivances. This is the question which was tried at Portsmouth on August 26. The *Resistance* was anchored in St. Helen's Roads, in $5\frac{1}{2}$ fathoms of water, with 300 tons of ballast to give her a list to starboard. The India rubber sheets, of various thicknesses, were fixed inside the vessel, divided into compartments numbered from 1 to 4, on the port side, which was heeled up out of the water. The *Pincher* fired two rounds of steel shells from 6 pounder quick firing gun, which passed through No. 4 compartment, "tearing into shreds the India rubber," which was placed at $3\frac{1}{2}$ feet from the ship's plates, and passing through two bulkheads, splintering the wood in all directions. The *Blazer* then fired with 5 inch breech loading common shell weighing 50 pounds. In No. 3 compartment, where the India rubber was only $\frac{1}{2}$ inch thick, it was torn

away, the shell smashing the bulkheads in the rear, but not passing through the ship. A clean hole was made in the ship's plate. Two more similar shells were fired through 1 inch India rubber, and two through $1\frac{1}{2}$ inch; 6 inch gun shells were afterward fired through $1\frac{1}{2}$ inch India rubber. On righting the ship, water entered the holes so fast that they had to be plugged to prevent the vessel from sinking. The *Pincher* then fired her 6 pounder quick firing gun against a part of the *Resistance's* hull which was covered outside with India rubber, and another part lined with asbestos 14 inches thick, supported by a thin steel plate. Seen from outside, it appeared as if little damage had been done; but the shots had passed in through the India rubber, carrying debris with them, and water poured in freely. The asbestos closed up behind the shot.

The most important part of the trial is the action of the 6 pounder quick firing gun shell, for the reason given above—that it is by quick fire that destruction to unarmored parts of ships is threatened. The larger shells could hardly fail to cause leakage, but they can only be delivered comparatively slow. It was hoped that the remarkable action of closing in of the India rubber might have been effectual in keeping out water; but it is not surprising that this should not be the case under any great pressure of water. The results are thought sufficiently discouraging to prevent further trial at present.

NEW ORLEANS.*

On the twentieth of December, 1803, France ceded Louisiana to the United States, and New Orleans became American. Despite the eighty-three years that have passed, the influence of the French character is still very manifest in this great city, which now numbers more than 216,000 inhabitants, of which about 20,000 are compatriots of ours.

The gayety and bustle that prevail in the streets have not the same character as in the other cities of the United States, and in certain quarters one might almost believe that he was in a French land.

Moreover, our language is still extensively spoken here, the ordinances and handbills are to-day translated into French, and the inhabitants of the low quarters of the city would not find it convenient to remain there without being familiar with our tongue.

A large number of streets still bear French names, and the same is the case with the merchants' signs.

It is also observed that the old colonists, the representatives of France in this city, have left marked traces of themselves here, but these are gradually disappearing, day by day, and will doubtless soon be destroyed forever.

If there is any port in the world of strange and picturesque aspect, it is that of New Orleans.

From September to December, an army of laborers—negroes and mulattoes—is employed in gathering the cotton crop in the interior of the State.

The railways, and especially the steamboats, carry immense loads, and business receives a great impetus.

The steamboats, like floating fortresses with walls formed of bales of cotton, come from all quarters, and

to 10,226 bales of cotton. Up to that time a steamer of this kind had never been known to carry so heavy a cargo.

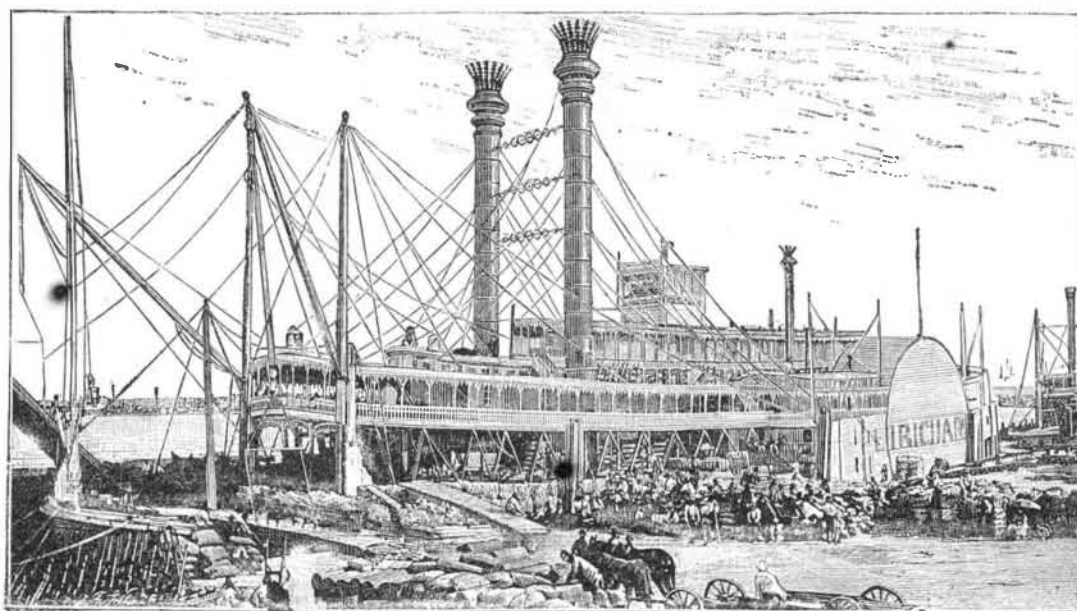
Our engraving represents a steamer analogous to the one just mentioned, the *E. D. Richardson*, which, as may be seen, is unloaded.

The method of loading is curious. Throughout nearly the entire length of her deck the steamer is provided with an immense central saloon for passengers, at the sides of which are staterooms for the accommodation of more than two hundred persons, and various rooms for the service, and so forth. This saloon gets light from a covered gallery, which serves also as an external promenade. The next deck is constructed in the same way, and this is surmounted by a third, all three of them being elegantly decorated. On a level with the main deck a wide platform, supported here and there by the iron beams that form part of the structure of the grand saloon and staterooms, increases the general surface of the steamer. The one on the *Henry Frank* is 55 feet in width. It is upon this platform that are placed the cotton bales, these being gradually piled up on it in such a way as to entirely hide the passenger saloons. Care is taken to preserve embrasures between the bales for the entrance of air and light to the interior. When the loading is finished, the bales of cotton fill all the side spaces of the steamer and extend to the upper promenade deck.

The weight of all these bales (averaging 450 lb. each) causes the boat to sink so that the water nearly reaches the first row upon the platform, and often wets it, through the vessel's motions.

After the cargo has been discharged upon the wharf, merchants come to make their purchases, and the bales are at once sent to the cotton presses to be reduced in size. One of the characteristic sights of the city is the quarter where the vast pressing establishments are situated. There are nearly twenty-five of these in New Orleans, each of which cost about a hundred thousand dollars to fit up. They contain a large number of presses of different styles, but the ones most used are Taylor's Hydraulic and the New Morse. The latter have been the favorites since 1877. There are over fifty of them in the city, while there are only about thirty of the Taylor. Mr. Morse, the inventor, has manufactured a large number of models since 1872, but his last apparatus, the New Morse, seems to combine all the qualities of economy, strength, and power. Many of these apparatus have already pressed from 500,000 to 1,000,000 bales without having undergone any wear and tear. It is curious to watch the machine while in operation. The bale of cotton is picked up by negroes, who put it into the press, which is at once set in action. The press flattens the bale, through its formidable weight of five million pounds, and reduces it by nearly three-quarters of its original dimensions. Covered with coarse sacking, the bale is bound with strips of sheet iron that are passed through apertures formed with this intent in the compressing plates. These iron bands are then fastened by the workmen, and the machine ejects the bale automatically, in order to receive another.

These wire bands are a great improvement upon



A MISSISSIPPI RIVER STEAMBOAT.

deluge the wharves and storehouses with the harvested crop. These vessels will sometimes carry 5,000 or 8,000 bales or more. One of them, the *Henry Frank*, which is 300 feet in length, and of 2,600 tons burden, made a sensation on the wharves on April 20, 1881, and her captain received an ovation because of her extraordinarily heavy cargo. This consisted of 9,226 bales of cotton, 1,213 bags of cottonseed, 1,224 bags of oil cake, 500 bags of various grains, and 27 packages of different kinds. The whole may be estimated as equal in weight

the rope that was formerly used for the same purpose. They were invented and further simplified by Messrs. L. Miller and S. H. Gilman. It is a great advantage for the steamers to have the bales pressed, as they can thus carry a much larger number of them, and so they pay a fee of 65 cents per bale. About two million bales are annually exported.

Two-thirds of the city's population are occupied in this trade. The value of the exports may be estimated at \$100,000,000 per annum.

One of the most important questions to be decided, upon the subject of presses, has been as to

* Extract from "Letters from America," by A. Tissandier, in *La Nature*.

whether the quality of the cotton always remains the same after the bale has been pressed. It has been generally asserted that the cotton does not spin so well after it has been pressed, and that its quality is then inferior to that which has not been. The manufacturers of the Northern United States have been of this opinion; but, from a paper published by Mr. J. C. Hemphill in Special Report No. 47 of the Department of Agriculture, it will be seen that this opinion is not shared in England. Ideas have completely changed on this subject in that country, in consequence of some experiments performed upon cotton derived from Eastern India. On another hand, Mr. Dumont, a large manufacturer of Gaston County, in South Carolina, appears to have demonstrated, after many trials made with best kinds of cotton, that, far from diminishing the quality of the cotton, presses, on the contrary, improve it. He was surprised to find that there was less waste with pressed cotton, and consequently a greater product, and that thread made from unpressed cotton was perhaps stronger, but that that made from pressed was superior in lightness and evenness—two qualities that are now regarded as among the most important.

New Orleans is one of the chief ports of the United States. The Mississippi is here superb. In order to reach the mouth of the river, in the Gulf of Mexico, it requires a trip of about two hours; but the panorama that spreads out before one's eyes during this time is so interesting, with all its varied aspects, that no monotony can exist.

In its lowest parts, the river is about one hundred and fifty feet in depth, and ships often come near the shore; but the route that they have to take varies with the season, the channel being sometimes in the middle of the stream, and sometimes at the sides. But the route followed is always imposing, and the windings are numerous. The land is covered with fields of sugar cane, rice plantations, and large orange groves. Trees covered with flowers and fruit embellish the banks and encompass the houses and beautiful villas of the farmers and rich planters of the country.

The orange trade is very extensive on the banks of the Mississippi near New Orleans. An orange tree does not begin to bear fruit in this region until it is six years old. When it reaches ten years of age, it is capable of yielding as many as 3,000 oranges per annum. A little later, the annual crop may reach 6,000. Some trees are cited that have yielded even 8,000 oranges; but such an occurrence is spoken of in the country as being exceptional. The maintenance of an orange tree requires but little labor, and the cost of it is covered by an average of 50 cents per annum paid to a laborer. It will be readily seen how large a profit is made on each tree by its owner, who sells his oranges at \$3 per hundred.

Sunlit landscapes succeed one another, and form brilliant pictures of truly fairy aspect. Culture becomes rarer in measure as we approach the mouth of the river. A few farms are still to be seen, shaded by ancient trees that are covered with a gradually encroaching moss* that will finally kill them. This parasitic "moss" is collected in large quantities and dried by the inhabitants. It is used for the same purposes as the seaweeds that we collect on our coast.

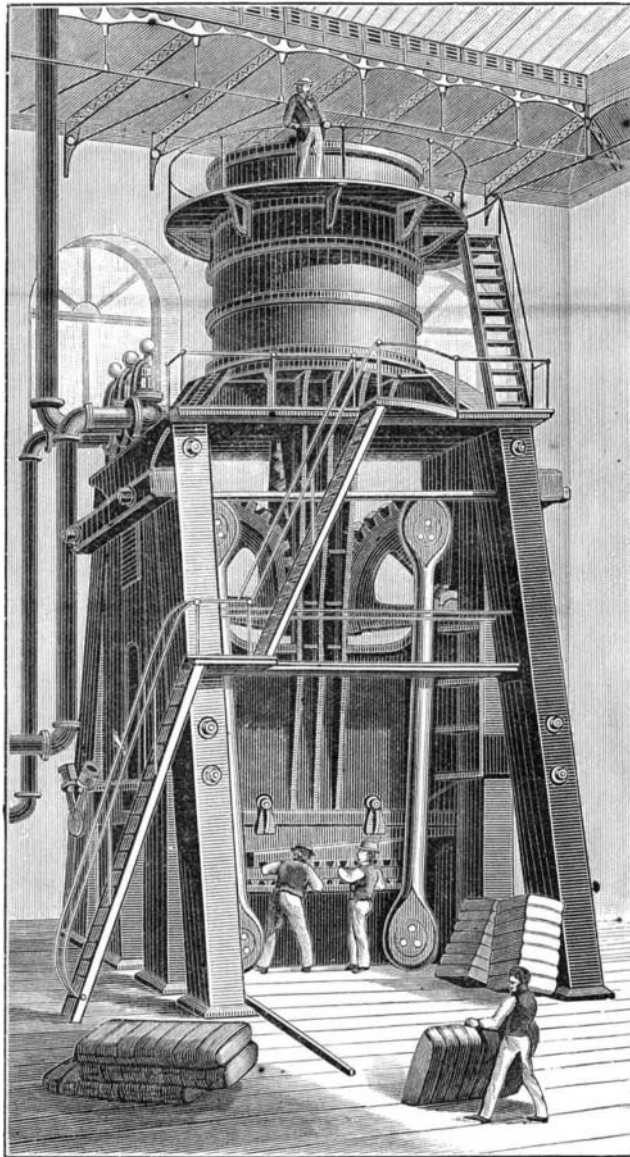
A large number of ships were met with during this long trip. Among others, we saw a small steamer that was approaching us with great speed. It was the letter and dispatch boat, that does postal service for the country and villages along the river. It approaches the shore, and lowers from its deck a sort of drawbridge. Three men run down this and push barrels, packages, and other objects before them. It takes but a second for this maneuver, when the men are all aboard again, the bridge is raised, and the steamer is off, seeming to disappear as if by enchantment, in order to deposit letters and packages elsewhere. Finally, the river begins to contract, reeds cover the banks, as well as the sandy grounds, that are inhabited by birds that, frightened by the noise of our vessel, take to their wings. The delta of the Mississippi occupies an immense territory, consisting of marshy tracts that extend away out of sight. The outlet is

**Tillandsia usneoides*, the long, black, or Spanish moss of the Southern States. Not a lichen (as stated by Mr. Tisserandier), nor a moss, but a pendulous, fleshy flowering plant, with thread-shaped stems, belonging to the same natural order with the pineapple.—Ed.

very narrow, and is inclosed between jetties roughly built upon piles, with hurdles filled in with stone. The width of this outlet, which gives access to the Gulf of Mexico, is but 200 yards.

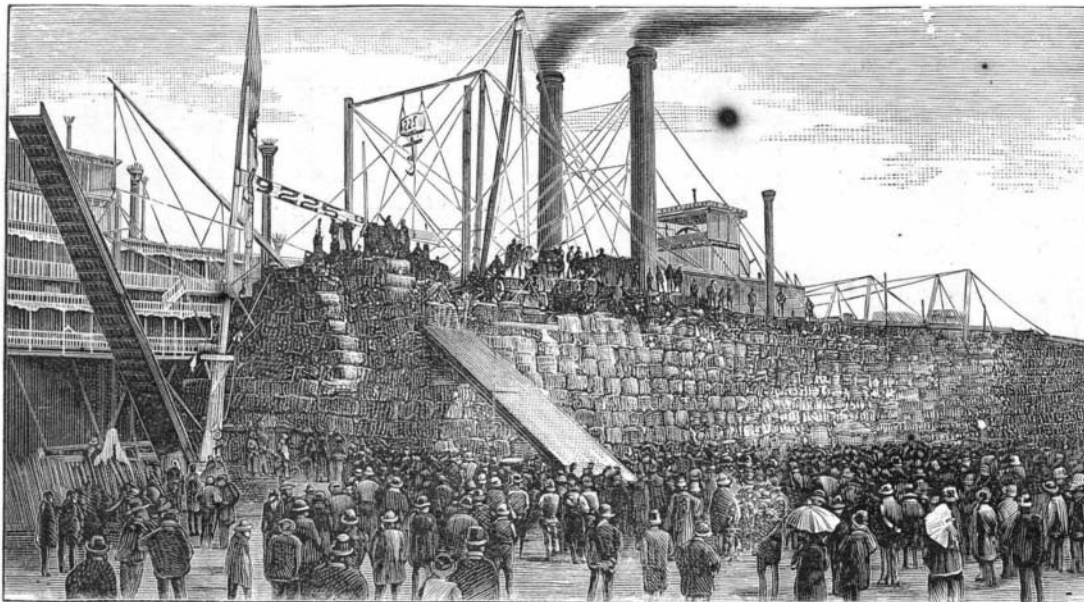
Slow Combustion.

Spontaneous combustion is said to be an impossibility.



NEW ORLEANS COTTON PRESS.

ity, but a phenomenon that at one time would be ascribed to that cause has lately been observed in the suburbs of Paris. In 1871 a fire occurred in a villa. The reparation was carried out under the direction of an architect, and the house has since been occupied by the same owner. One day he observed that the ceiling of the dining room appeared as if some of the plaster was about to give way, and, as the bulging increased, he called in an architect. He concluded that a beam must somehow have given way, and workmen were employed to make a more close examination. It was then discovered that the wood was almost entirely consumed. Some spark may have remained, and during fifteen years the destruction must have gone on by inches, for no other hypothesis was brought for-



A NEW ORLEANS COTTON WHARF.

ward than one of very slow combustion. The circumstance is so remarkable as to appear almost incredible, although firemen can relate stories of a similar kind.

A HUNDRED-ACRE peat bog has been discovered near Ellendale, Dak.

The Benefits of Machinery.

The other day the introduction of a machine for "basting" the hems of certain garments, into a factory in New England where clothing was made, was the cause of great complaint and almost of a strike; the reason being that one such machine would do the work of five or six women, who would thus be thrown out of work. This little incident, of itself insignificant, supplies a curious illustration of the tenacity with which ignorant people, in spite of the overwhelming evidence of experience, hold to the notion that machinery is the enemy of the laborer. The proof that mechanical invention has helped the laborer far more than it has helped any one else is of the most conclusive character. We cannot present the whole case here, but let us take two or three facts.

In ancient times a conquering invader of a country always concluded his victory by doing one thing: he swept off a large part of the population, took them home with him, and made them slaves. Why? Because he wanted to remove from his own people a part of the burden of toil. History is crammed with accounts of such performances. In fact, the process endured to our own time, for the capture of negroes in Africa, and their deportation to this country to be sold as slaves, was simply another form of the old business. The slave trade merely supplied a demand for labor from people who wished to reduce their own labors. Now, observe: The invention and general introduction of the steam engine ended this kind of thing forever, for it gave to man a servant far more tractable, more economical, more energetic, more tireless, than any number of human servants could possibly be. The first effect upon the laborer, of this change, was to uplift him and give him dignity. Labor is no longer joined with slavery.

This is the century of the steam engine. This same century has witnessed the emancipation of the slaves in this country and of the serfs in Russia. It will not close before the slaves will be freed in Cuba and Brazil. Then there will not be an involuntary bondsman in any civilized land on earth. That majestic fact, of vast importance to the toiling man everywhere, is due solely to the advancement of mechanical invention. And, meantime, the general status of the laborer has been so much advanced that he is now for the first time in the history of the world counted as a great political and social power. The laboring man to-day is on top. That is a practical, even if it be a startling, fact.

Note this, also: The laborer in civilized countries now earns more money than he ever before earned, and the things which he requires for his comfort and his pleasure cost less than at any former period since the creation. If workingmen would only read history, they would find much to induce them to greater contentment. There was not in the British Islands, three hundred years ago, a dwelling house that would compare in comfort with any one of the tens of thousands of excellent homes owned in this country to-day by men who earn ten or twelve dollars a week. Such a man has articles of furniture, clothing, books, newspapers, musical instruments, opportunities of cheap conveyance, chances for free education, and hundreds of other blessings which nobody had two centuries ago, and all of which have tended to make laborers more comfortable, happier and healthier, and within easier reach even of wealth. The whole of these advantages have been supplied by machinery. The poor man has them because machines have been invented to do the work which men used to do, and because these machines have capacity for production far beyond the unaided capacity of man.

The truth is that the displacement of human labor by machinery has always been followed by an increased demand for such labor at better wages and a decrease of the prices of the articles for which wages are expended. In the entire range of mechanical invention we cannot now recall a single exception to this rule.

In view of such facts, there is something almost pitiable in the persistence with which working people continue to manifest antagonism to the introduction of labor saving devices. Such hostility, wherever and whenever it is manifested, involves a confession of unpardonable ignorance and stupidity.—*Textile Record*.