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## THE TROY FIRE AND IRON-PROOF SAFES.

The Troy Times in commenting upon the remarks of our correspondent respecting the late fire in that city and its action upon iron safes which appeared in the SCIENTIFIC AMERICAN two weeks ago, charges that our correspondent intended to make a thrust at Mr. Lillie, whose safes are extensively made in that city.

We beg to assure our cotemporary that our correspondent is a high toned gentleman, having no other interest in the matter than to elicit the truth, and in no way concerned either in the manufacture or sale of safes.

In conducting the SCIENTIFIC AMERICAN we are not in the habit of accepting without proper reservation the statements of interested parties in matters which are liable to become the subject of dispute. Our correspondent had no intention to reflect upon the Lillie safe—of this we are perfectly assured.

In the communication referred to our correspondent uses the following language: "Hardly a safe standing out uninclosed by brick has passed through the fiery ordeal." This is really the point of his observations, and how is it sustained by the facts? One of the Troy papers says: "Most of the safes were subjected to an intensity of heat, and for a length of time, which no safes were ever made to withstand, and against which no safe manufacturer, in his senses, would warrant his to pass through with contents uninjured. The result of the most rigid inquiry and investigation will show, we think beyond a doubt, that no safes in the fire came out less damaged than those of Lillie's manufacture."

This confirms in substance our correspondent's advice, that too much dependence should not be placed upon the perfect fire-proof qualities of any safes. In cases of intense heat, and when not encased in brick-work, they are liable to be destroyed. The Troy Times, in its criticism of our correspondent's communication, admits that iron safes (not Lillie's) supposed to be fire-proof, "were burned up, and, as a matter of course, not the least vestige of anything valuable, that was in them, was saved from the flames." Fire is a powerful element, and has often baffled the wit and wisdom of the most ingenious of mankind in attempting to stay its ravages. And we but do our duty as public journalists when we advise the public to be cautious in guarding against its power. We have friends, almost under our eye, as we now write, who lost nearly \$200,000 worth of securities by confidently relying upon the protection which they reasonably supposed to exist in a fire-proof building, and an iron safe.

## INVENTORS LOYAL.

It has afforded us the greatest pleasure to notice the patriotism and loyalty to the government of the great body of our inventors. Thousands of them are serving in the army and navy, as soldiers, seamen, engineers, artisans and mechanics, and their labors have been of great benefit to both branches of the public service. As our army advances, and liberates them from the grasp of tyranny and oppression, this class of our fellow citizens in the rebellious States, prove their devotion to the old flag. Already we have letters from our former patrons in New Orleans, and from portions of Tennessee and Virginia, which

give unmistakable evidence of their patient devotion to their government and country. This is very gratifying to us; it bears out our former impression that no more loyal class of citizens could be found than our inventors.

## EMPLOYMENT OF FEMALES IN INDUSTRIAL OPERATIONS.

The employment of females in industrial operations has the same effect on the wages of male mechanics and laborers as the use of labor-saving machinery. If a people is so savage as to till the earth with their naked hands, and to spin the material for their clothing by twirling the thread between the thumb and finger, they cannot be as well fed and clothed, as they could if their agricultural operations were conducted with the aid of cast-steel plows and reaping machines, and their manufactures had the service of steam engines and all the complex mechanism of modern civilization. Men labor in order to provide for themselves wealth in all its forms—food, clothing, houses, fuel, horses, books, &c. Gold and silver coin is used merely to effect the exchange of the surplus products of one man for the surplus produced by another. The amount of wealth which any people produces depends wholly upon the effectiveness of the tools with which they work, and on the constancy and skill with which these tools are used. A manufacturing establishment filled with looms and spinning frames is just as really a tool as an ax or a hoe. All forms of active capital are really tools in the hands of laborers.

The more abundant and excellent the tools with which any people works, the larger will be the product of wealth to be divided among the individuals. Consequently, the wages in any country are almost exactly in proportion to the amount of labor-saving machinery which it employs. In Hindostan, where cloth is woven by hanging the harness on the limbs of a tree, wages of able bodied men are two and a half cents a day, while in this country, where labor-saving machinery is most freely used, wages range from ten dollars a month upward. Sixty years ago, before the introduction of the power loom and the steam engine among us, the regular wages for men was about seven dollars per month in the average, and excellent seamstresses were hired for forty cents per week.

Now, the effect of having half of the community idle is precisely the same as the effect of working with poor tools; it diminishes the aggregate product of wealth, and there is consequently less to divide among individuals; in other words wages are lower. Those English, Scotch and Irish mechanics who protest against the employment of females in industrial operations, for fear that it will diminish their own wages, are just as foolish as their brother mechanics who object to the use of labor saving machinery.

We are very proud of the fact that so few American mechanics—the graduates of our public schools—fall into either of these delusions. They do not get up mobs to break steam engines in pieces, neither do they organize strikes because girls are employed in the shops. They are quite willing that the roughest and hardest labor should be performed by the iron arm that never tires, and in the more delicate portions they welcome the proffered aid of woman. There is a manliness, too, engendered by our free institutions, that prompts all classes of our people to bid defiance to competitors. We recently heard a broad shouldered, six-foot printer remark, "If I cannot make a living in spite of the competition of women, I may starve, but I do not believe that I shall complain."

## PROGRESS OF OUR IRON-CLAD FLEET.

Three large and splendid impregnable war steamers, on the plan of Ericsson's Monitor, are nearing completion in this city. The builder is Thomas F. Rowland. These vessels will be finished on the stocks, and they are to be launched about the first of August. Three other boats of the same kind are building at Boston, Mass., two at Chester, Pa., and one at Wilmington, Del., making nine in all.

In addition to these, the government is building several other iron-clad vessels of the strongest character, so that we shall soon be in possession of an

iron-clad fleet that will be able to compete with any of the naval powers of the world.

It will not be long before every harbor and river of rebeldom will be fully commanded by these terrible messengers of destruction. With all the vital points and avenues of their territory patrolled and penetrated by the Union iron-clads, it would appear certain that the secessionists will at best have a very brief and uncomfortable existence.

## CAPT. NORTON AND THE SCIENTIFIC AMERICAN

Last week we published a plan for blowing up iron-clad ships, and by the last arrival from Europe we find precisely the same plan suggested by that fertile inventor, Capt. J. Norton. His plan was published in *Saunders's News Letter and Daily Advertiser*, of Dublin, and the paper with the article marked and directed to the SCIENTIFIC AMERICAN, was on its way across the Atlantic at the very time that our article was going through the mails to our subscribers. To show how exactly alike the two plans are, we publish Capt. Norton's letter:—

TO THE EDITOR OF SAUNDERS'S NEWS LETTER:—*Sir*—As the Emperor of the French and the American government are enthusiastically turning their attention to the best means for sinking iron-clad men-of-war, I propose to do it by having a powerful iron-clad ram, provided with a long iron pole, to be shipped to the stem of the vessel under water at the line required; at the point of this pole I would attach a shell or caisson, charged with the most approved fulminating powder, and the invulnerable ram would push its pole under the bilge of the Monitor, in its weak wooden bottom; I would pull a string, which would instantly fire the shell by friction, and give the Monitor and all in it a cold bath. I am ready to practically prove my *modus operandi* to all taking an interest in such an easy way of disposing of an invading enemy.

Yours, &amp;c.

J. NORTON.

Howard's Hotel, Kingstown, May 15.

## THE NEW IRON STEAMER "SCOTIA."

The new steamer *Scotia*, the latest built of the Cunard line, has been here for two weeks, and departed the 4th inst., on her first return voyage to Liverpool. Considerable interest has been attached to this steamer on account of her being the largest merchant vessel afloat with the exception of the *Great Eastern*, and also because she is the latest effort of the celebrated engineering firm of Robert Napier and Son, of Glasgow, Scotland. She is built entirely of iron, and is a paddle-wheel steamer. Her tonnage by builder's measurement is 4,050 tons; the length of keel and forerake is 360 feet; length over all, 400 feet; breadth, 47 feet; depth, 32½ feet. She exceeds the *Persia* in capacity by 450 tons. When loaded to 22 feet she displaces 6,500 tons. Immense in size as the *Scotia* is, she is so well proportioned and sits so gracefully in the water that she does not appear to be such a large vessel as she really is. Her engines are two in number and are splendid specimens of mechanical skill; they are rated at 883 nominal horsepower, but are capable of working up to 3,000 united horse power. They are of the old side-lever pattern, with several new attachments. The valves used are Waddle's (engineer of the *Persia*), balanced double port D-slide kind. Each of the steam cylinders is 100 inches diameter by 12-foot stroke—two ft. longer than the engines of the *Persia*. The pressure of steam carried is 25 lbs., and it is superheated to 318° Fah. Two superheaters are employed; each has 14 pipes 16 inches diameter and 9 feet in length. The flame from the furnaces passes through these pipes, while the steam flows around them on its way to the cylinders. The superheaters can be disconnected from the boilers at any moment by a valve. The saturated brine water, in being discharged from the boilers, passes around a series of pipes, while the cold feed water goes through them on its way to the boilers. By this arrangement the feed is raised to about 150° before entering the boiler. Four large tubular boilers, having 40 furnaces, are used. The main intermediate shaft between the two engines is 31 inches in diameter; the side levers (inverted beams) are each composed of two plates of rolled iron 22 feet in length, 7 feet wide at the middle and 2½ inches in thickness. The rolling of these immense plates was a work of great difficulty. Only one firm in England would undertake the task, and out of the first eight plates that were rolled, seven were rejected on account of defects. All the parts of these engines are massive; some idea may be obtained of the size of their parts by stating that one of the slide valves weighs no less than two tons. The paddle wheels