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NEW YORK, SATURDAY, JUNE 29, 1861.

THE END.

With this number ends Volume 4 of the New Series, also about 5,000 subscriptions. Many of these subscribers are in the seceded States and with whom we have no means of communication. We therefore urgently appeal to our friends in the loyal States to renew their subscriptions without delay, and induce some friends to join with them. We shall thus be encouraged to enter upon the new volume with a determination to make it in every way the most interesting, and valuable we have yet published. This is a time of stirring interest. The national government has entered upon a vigorous defence of its own existence. The inventive faculty of the nation will be fully aroused to devise and bring forward the most formidable projectiles of war, which is one of the great sources of power upon which the government must rely, and the loyal States have inexhaustible resources in this respect, of which its enemies are sadly deficient. We shall watch these matters with the closest attention, and carefully report every thing of interest connected therewith, and shall illustrate all the important improvements that are made in every department of the mechanic arts.

Through our correspondents in Europe, and by the aid of our excellent French, English and German exchanges, we are able to keep our readers thoroughly advised also of the progress which is being made in all foreign countries.

If industry and a desire to please our readers can bring success, then we shall hope to receive it. We shall do our best.

The SCIENTIFIC AMERICAN is the only journal now published in the United States devoted to the mechanic arts and popular science. Two volumes are published each year, costing but $1 each. The numbers for the whole year, costing but $2, contain 832 pages or 2496 columns of matter, mostly original, illustrated with hundreds of spirited engravings executed in the highest style of the art.

Our invariable rule is not to thrust our paper upon those who do not express a wish to receive it, and following out the rule which we laid down at the start, we shall stop sending it to those who do not renew. We hope all will renew. We shall reluctantly part with a single subscriber.

THE GREAT INVENTIONS OF THE LAST SIX MONTHS---HOW AN IMPORTANT INVENTION WAS SUGGESTED.

Notwithstanding the general diversion of the attention of the community to military matters, caused by the great Southern rebellion, we believe no former volume of the SCIENTIFIC AMERICAN contains the record of so large a number of valuable inventions as this which closes with the present number.

Of all these, the one of which the success is most assured, so far as we are at present informed, is F. F. Smith's simple invention for casting steel plows. A description of this will be found on page 154. Mr. Smith called on us last winter for the purpose of expressing his gratitude for the benefit which he had derived from the SCIENTIFIC AMERICAN. He told us the story of his life. He said that, after working a long time at his trade, he finally succeeded in starting in Ohio a little plow manufactory on his own account, which he was conducting in a very small way. One day, in reading his SCIENTIFIC AMERICAN, he saw an account of the casting of steel bells in England, and the thought occurred to him that he might cast the steel moldboards of his plows. The more he thought of it the greater appeared the advantages of the plan.

The moldboard could thus not only be fashioned in the exact form desired, but it could be made thickest in the parts most subject to wear. His patent we obtained for him after some difficulty after he had come to New York to consult us in regard to making arrangements for the manufacture of his plows. Believing that he had a valuable idea, we recommended him to apply to Mr. Collins, of the firm of Collins & Co., the celebrated ax manufacturers, for material assistance. This gentleman very promptly interested himself in the invention, and proceeded at once with the manufacture of the plows. Mr. Smith was to conduct the operation of casting, and he met with the very common experience of inventors, in encountering obstacles entirely unforeseen. In order to harden the steel the molds must be made of iron, and it was found that the molten metal would adhere as it hardened to the mold, and then, as it shrank in cooling, it would crack or warp. By skill and perseverance, however, these difficulties were surmounted, and a number of the plows were finished. Mr. Smith took these and started for Chicago, but the dealers whom he met on the way were so pleased with the article that he sold out his stock long before he reached his destination; and the fact that he was established in a prosperous and growing business was apparent. As he showed us one of his plows, he expatiated on those qualities that American mechanics are especially proud to exhibit in their work—plainness and simplicity, with accuracy of workmanship. "There is not an ornament about it," he said, "and every joint will pinch a hair."

There is another western invention described in this volume, which, though it has not yet passed into extensive use, seems to us to give promise of great results. We allude to Philips' carriage spring, illustrated on page 392. Besides these, the volume now closing contains descriptions of Crary's brick machine, Whipple's air engine, Wilcox's air engine, Millar's cork-cutting machine, Aiken's knitting machine, Wharton's turnouts for city railroads, Bowker & Bensel's stave machine, Victory's wool spinner, Hotchkiss', Cochran's and Sigourney's projectiles, Rodman's mammoth cannon, Dahlgren's howitzer, and many other inventions equally meritorious; some of those not named being likely to prove more valuable than any of these that we have mentioned.

With the increase in the number of our inventions, it is very gratifying to see a vast improvement in their quality. In place of pursuing perpetual motion and other kindred delusions, we find a constant increase in the number of our inventors who patiently study the laws of nature for the purpose of compelling her great forces to the service of man. In spite of foes without and within, in spite of wars and rebellions, the industrial and intellectual activity of the American people is carrying the nation steadily onward in civilization and power, and we strive to keep the SCIENTIFIC AMERICAN up with the progress of the times in every respect.

Give us your patronage, friends, and we will render you a full *quid pro quo* for all the money you invest with us, whether for subscriptions or for professional services in obtaining your Letters Patent.

EXPERIMENT WITH HAND GRENADES.

On Saturday, the 15th inst., a trial of a hand grenade, recently invented by W. F. Ketchum, of Buffalo, N. Y., was had at the foot of Fifty-first street, in this city. This street terminates at a precipice some 30 feet in hight, and has been finished with a masonry wall crowned with a parapet, making an admirable place for the experiment. The inventor had caused a pen about 12 feet square to be constructed of inch boards at the foot of the wall, down into which he hurled his grenades, standing behind the parapet to shield himself, as did also the company of spectators. The grenades are oblong shells of cast iron, filled with powder, their walls being about half an inch in thickness. A rudder or tail piece of stiff pasteboard is fastened at one end, so as to insure the flight of the projectile with the opposite end foremost, and a percussion cap is so arranged that when the forward end strikes the shell is exploded, throwing the fragments in every direction with great force. At the trial, every shell burst on striking, and the fragments (some of which weighed probably half a pound) were driven through the boards, especially shivering the floor where the shell struck into splinters.

The principal purpose of these grenades is to defend merchant ships against the attacks of privateers. As one man could throw at least 60 of them into a boat a minute, and as each one of the largest size is as destructive as a 5-pound bomb shell, they are very formidable weapons of defence. They would be useful in defending forts when stormed, in breaking charging lines of infantry, and especially in defending Western stockade forts against attacks of Indians.

Hand grenades were formerly made with fuses to be lighted by a match at the time of throwing; but the great uncertainty of this mode of firing caused them to go out of use. They would sometimes explode in the hand before thrown, and would sometimes be picked up by the enemy and tossed back. But Mr. Ketchum's grenades explode by impact, and they are so constructed as to be in no danger of bursting at any other time.

From the experiments which we saw, we came to the conclusion that this is a very safe and efficient shell; and as soon as the patents have been secured in this country and abroad, we shall give a more detailed description of the mode of discharging the grenade.

Messrs. Carhart, Needham & Co., the extensive melodeon manufacturers, No. 99 East Twenty-third street, are interested with Mr. Ketchum in this invention.

EX-COMMISSIONERS HOLT AND MASON.

Hon. Joseph Holt, so well known to our readers as formerly Commissioner of Patents, and more recently Secretary of War, has just addressed an eloquent and able letter to the people of Kentucky, urging them to support the Federal government in its endeavors to crush out rebellion. He scouts the idea of the armed neutrality position which Kentucky has assumed in this controversy, and calls upon the people to stand by the old flag Mr. Holt's loyalty to the government is unconditional; there is no *if* about it. He stands firm upon the constitution, and upholds its authority against all enemies.

Judge Mason has been appointed by the Governor of Iowa as one of the Commisioners for that State to negotiate a loan of $800,000 for war purposes; and it is reported that he will be commissioned a Brigadier-General in the army. The Judge was educated at West Point.

New Screw Steamer.

A new screw steamer, called the *Mercidita*, completed in this city for the Havana trade, made her trial trip last week. Her hull was built by E. Upton, of Williamsburgh, and her engines by Murphy, McCurry & Co., Beach street, this city. They are 300-horse power. The bearing boxes of the propellor are cellular, forming water chambers communicating with one another, and through which a current of cold water is continually flowing. This is for the purpose of preventing overheating of the shaft, without bringing the water into contact with the frictional surfaces. The shafts of propellers and paddle-wheel steamers are very liable to become overheated, and the common mode of preventing this is by keeping a stream of water flowing over the journal boxes. It has been found in practice, that the salt water thus applied oftentimes eats holes into the frictional surfaces, hence the application of the new kind of refrigerating journal boxes by Mr. A. Doig, engineer. The steamboat *Dutchess of Poughkeepsie*, running on the Hudson river, was fitted with such boxes last summer, and it is stated that they have been found very beneficial. These are the only two vessels to which such journal boxes have yet been applied.

Bound Volumes.

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