Correspondence

Why our Big Cannon are a Failure.

MESSRS. EDITORS:—Without entering into any discussion on the many scientific points connected with the strength, &c., of the various kinds of metals, I desire to state one or two practical, common-sense reasons, why our big guns are a failure. I assume that they are a failure, for that every well-informed man whom I have met, admits. Of course, I do not mean that they cannot be fired; but that they fail to produce any such results as were expected and predicted of them. First, they are a failure, simply because, being made of a weak material—cast-iron—they have not sufficient strength to permit the use of the requisite quantity of powder. That tells the whole story. Suppose I were to propose that our rifles, muskets, and pistol barrels should be made of cast-iron, what would any person of sense say? Why, that I was either a fool or a lunatic! Now, without hinting that Admiral Dahlgren is either, I should like that he or any other man, would tell us wherein that would differ from his present practice of making our big guns of cast-iron alone? Are not large and small arms both operated upon the same principle—used for the same purpose—and subjected to the same forces—differing only in degree or quantity? If cast-iron is best for large guns, why not for small ones, also? If wrought-iron, or steel, is best for rifles, why not for cannon also? Or, if a union of two metals is best for the one, why not also for the other?

Second, they are a failure, because the quantity of powder used is altogether too small for the weight of the ball. This is a direct result of the first proposition; and may be considered as a repitition of it in another form. To understand the full force of this, let me illustrate briefly. Any projectile, to produce the best result, must have a certain amount of weight; else it has no force, or velocity. For instance, a chip of wood cannot be thrown to a great distance, or with great velocity, even if you use a tun of powder upon it; and a shaving, or other lighter material, will have still less velocity and force, and go a less distance; no matter how much power is used to start it. It does not acquire momentum, because it lacks weight, and is not sufficiently compact and heavy. A stone will go further, and strike with greater force; and a lead ball still more so. On the other hand, if the projectile be too heavy for the propelling force, the same result will follow. It will not be moved with velocity; consequently will go but a short distance, and strike with but little penetrating force. Every school-boy understands this perfectly; and hence, if he desires to break a window, or batter down a door, he does not take a chip so light that it will not reach the object, nor a stone so heavy that he cannot throw it. On the contrary, he selects one having sufficient weight to give it momentum; yet not too heavy for his propelling power. Thus it will be seen that there is a limit to the weight of the projectile, in both directions. It must be neither too light, nor too heavy; and—what is equally important—it must be proportioned to the propelling power—the charge of powder.

Now, the whole trouble with our *Monitor* Dahlgren guns is that they have not sufficient propelling power—they don't burn enough powder. They cannot do so, because they are too weak; and they are too weak, because they are made of cast-iron. "That's what's the matter." True enough, a large ball is a very destructive thing, if it hits hard; but not if it falls short, and don't hit at all, or barely reaches the object, as it stops. You can never batter down a man's door by throwing rocks so large that they just do not reach it, or barely touch it. Better take a smaller one, and send it with more force—it will do a great deal more execution.

The only account that I have yet seen of these huge guns producing any important result, was in the experiment upon an iron-clad target, at the navy yard, in this city. There, it will be recollected, they used the Stafford projectile—a sub-caliber shot—a 9-inch projectile fired from a 15-inch gun, at short range, and having a weight in proportion to the charge. There is no doubt that at a very short range, the big balls would have sufficient velocity to cause great damage; but before they could be got within range of the enemy, his steel rifled guns and steel projectiles would sink or disable vessels carrying our big guns, as at Charleston. In an article on the blockade, published on page 310, Vol. VIII. (new series) of the SCIENTIFIC AMERICAN, I see it stated that the Whitworth guns employed by the rebels are effective at five miles. Certainly, no one will pretend that any of our 15-inch guns have begun to do anything like that. What nonsense then to continue wasting money on them, when so much better ones are known to exist! Therefore, I trust the statement is true which is referred to in your article on page 330 of the same volume, on "Changes in the Iron-clads," that these Dahlgren guns are to be replaced by others using 75 pounds of powder. That is a step in the right direction; as all experience, at home and abroad, fully testifies. To please the fancy of Admiral Dahlgren, in these huge experiments, everything else, including efficiency, and, of course, success, has been sacrificed. Instead of from ten to sixty guns, our war vessels now carry but two, and they so ponderous, clumsy and unsafe, that they can only be fired at long intervals, with small charges—occupying much room—employing many men to handle them, and doing comparatively little damage to the enemy. I fully agree with you in the idea, that we can produce as good guns and projectiles as the Whitworth, or any other that has been made; but it will not be done by Dahlgren, or any one following in his footsteps. That will only be accomplished when the intelligent inventors of the country can obtain a hearing, and have a fair trial at the hands of the Government; instead of being thrust aside by officials intent upon carrying out their old-fogy ideas at the nations expense; regardless of their effect upon the contest in which we are involved.

It is a great pity that Gongress did not, at the extra session, make an appropriation, and provide for the appointment of a board, composed of the most competent men in the nation, who should in no way be connected with any pet scheme or contract, to receive and fairly test every improvement submitted to them by inventors. Had that been done—as urged by many intelligent and earnest persons—we should long before this have known exactly which were the best guns and projectiles; instead of being as we now are, still in ignorance and doubt upon this important subject. The money already wasted upon these monster failures, would have more than defrayed all the expenses of such a board.

RIFLEMAN

Washington, July 18, 1863.

The Stafford Projectile.

MESSRS. EDITORS:—I am much obliged for your timely remarks in the SCIENTIFIC AMERICAN of the 25th inst., noticing the report of Commodore Turner, of the new *Ironsides*, in regard to some shot fired by his order from the 8-inch Parrott gun.

The truth is, that in obtaining shot of my patent for service, the order was given for 250 pound shot, of large caliber, never before tested: the heaviest shot ever tried by me having been from the 7½-inch Dahlgren gun: weight of shot 85 and 108 pounds. Before the 250 were finished, I sent samples of them to Washington, and urged to have them put immediately under fire, on from 6 to 9 inches of iron. This, however, was neglected; and the shot were sent off without trying one of them. On testing them, it was ascertained that the rear sabot or reinforce, was too light for this weight of shot; and the fault was in not finding this out before, and having it remedied, as will be done in a few days.

All the other sizes have been under fire, and prove, as they always have done, the most destructive shot used in the service. The price may seem large, but cast steel at 22 cents per pound, rough, is no fault of mine. Time will prove it the cheapest shot that can be made for certain purposes, for the reason that nothing else than good steel will do the job. One of these shot, properly made, if fired against an oblique surface of iron, is worth a tun of anything else; and the price, in such a case, is nothing. Any shot fired by me at West Point, or Washington, for penetration, would have sunk the *Merrimac;* while tuns of round missiles were hurled at this monster, which in every instance were defeated by her sloping armor.

In no experiment in this country or Europe, has 70 pounds of metal been fired through 6 and 7 inches of iron, from a cast-iron gun, with 14 pounds of powder, until I did it at West Point and in Washington.

The matter sums up thus: four shot, never before tested, have been fired to sea, and tumbled. This is no fault of the principle of the shot. The sabot being too weak for the weight of metal, was the trouble. That will soon be remedied, and when the remainder of the 250 ordered are heard of again, it will be from the wreck of some fort or iron ship.

More test experiments will soon be made in Washington and New York, against heavier targets than any ever before tried. Your readers will be kept posted as to the results.

C. W. STAFFORD, 48 Pine street.

New York, July 20, 1863.

Zinc Paint—Its Advantages and Disadvantages.

MESSRS. EDITORS:—I am a practical house painter, and wish to elicit information which will be of interest and value to the public at large, as well as to those who are specially engaged in the use of paint. Among the other advantages resulting from the use of zinc paint, is this, that a room, such as a sleeping apartment, painted with it, when dry, is without the bad smell, or other injurious effects which follow the use of lead paint. During the last six years use of this material, I have not had a man sick with painter's colic.

Another advantage is that a house painted with white zinc will hold its color, for years, whereas white lead will turn yellow in a few months. I venture to say that at the end of five years a house painted with zinc will look better than it would at the end of so many months if painted with lead.

Its drawback is that in repairing a house which has been done with zinc, a few years afterwards, the new paint does not adhere to the old, but peels off. I have tried everything my imagination suggests to find a remedy, but to no purpose. I have consulted the best chemists without avail, as also manufacturers of zinc, who can furnish no useful information, though they are most deeply interested in the discovery, as its use must be abandoned if no remedy is found. I hope this may attract the attention of scientific men to the subject. S. B. F.

New York, July, 1860.

Penetration of Projectiles at Different Distances from the Muzzle.

MESSRS. EDITORS:—You inquire if I have demonstrated that the penetrative power of a rifle bullet is greater at a distance of twenty feet from the muzzle than at one foot from it. I have tested the matter to my satisfaction with the following results: -For every inch a bullet will penetrate a uniformly hard substance, at a distance of one foot from the muzzle, it will only penetrate ·97916+ of an inch *at* the muzzle; at a distance of five feet, it will penetrate 1.015625 inches; at ten feet, 1.0415+; at twenty feet, 1 0865 inches; and from this, onward, the power to penetrate gradually decreases.

Theory:—The projectile force does not cease to act on the bullet at the muzzle, but follows it up for some distance; still pushing it forward, which accelerates its motion. As long as the force behind the bullet is greater than the resistance of the atmosphere before it, the motion will become more and more accelerated; but as soon as the projectile force is so far exhausted as to be only equal to the resistance before the ball, from that point its velocity is gradually retarded. The place, then, where the penetration of a rifle bullet will be greatest, must be just where the force behind, and the resistance before, it are equal; which will be found to be at or near twenty feet. G. BUCHANAN.

Hickory, Pa., July 10, 1863.

ONE of our exchanges, the Cumberland (Md.) *Union*, issued on the 4th of July, signalized the day by printing two sides of its impression in red and blue ink, which, on the white paper, was emblematical of our national colors, and proclaimed emphatically the sentiments of the proprietors; they must have had considerable trouble in displaying their loyalty so conspicuously.

Steam Domes for Locomotives.

The following extracts are taken from a very sensible article on the above-named subject, in the *Mechanic's Magazine* (London) :—

"Our engineers still seem to regard the steam dome as an indispensable adjunct to the locomotive ; at least, few or none are built without them. Indeed there seems to be rather a tendency to increase their size, and over-estimate their importance : due in some measure, perhaps, to the increased adoption of the flush boiler, which is not considered to be so well suited to the supply of dry steam, as those which have the outside fire-box shell considerably raised above the cylindrical portion of the boiler. The advantages held out by the dome are, however, more than doubtful, and can scarcely compensate for the additional weight and expense incurred by its use ; although it is urged that without it considerable difficulty is always experienced from priming. This, at best, but proves that such contrivances may be employed as a means of repairing faults of design in other departments of the engine ; and by no means demonstrates as a fact that they are actually indispensable, or, indeed, deserving of general adoption. In many engines we find them either omitted altogether, without at all impairing the efficiency of the machine ; or of such small size that they bear no comparison with the huge edifices recently introduced. Bury scarcely ever used the steam dome in its present form. True, he placed an immense hemispherical affair over his fire-box ; but this, in all cases, formed part of the external shell, and was merely a means of supplying the steam room. Forester's small domes were placed on an outside fire-box shell, the top of which was already raised 12 or 14 inches above the barrel. Such domes did not contain a cylinder full of steam ; and were only intended to permit the elevation of the steam-pipe to a good distance above the water level—a plan since carried out by other makers with good results. Stephenson, it is true, did of old, as his successors do now, pretend to the extension of steam room by the use of large domes : though the advantages gained from them in that way can be realized by far better arrangements.

"All things considered, if proper care be taken to secure perfect circulation in the water, we consider them unnecessary and injurious. It is not very easy to make a good dome. Its welding is a job which requires both skill and care ; and the difficulty experienced to some extent in making up the joint between it and the boiler shell, together with the cost of the outside ornamental casting, constitute it a very considerable item of expense. Its connection with the boiler also must in some degree weaken the latter, by rendering an aperture of considerable size necessary. Although a man-hole is always requisite to permit the proper inspection of the interior of the boiler, it does not follow, as a matter of course, that this is best closed by a steam dome. The contrary is the fact ; for the dome should be placed forward when the ebullition is least ; while the proper situation for the man-hole is, undoubtedly, over the fire-box. Indeed we find one there as often as not ; while a steam dome is fixed near the chimney, and supplied with an amount of internal apparatus, sufficient to prevent its use as an entrance to the barrel.

"A very slight increase in the diameter of a boiler, will easily provide as much additional steam room as a very large dome can supply, and does it, too, without extra expense or trouble, or weakening the boiler to any appreciable extent : not so much indeed as a large hole in the shell can do. Still some engineers seem to consider it necessary that the steam should be drawn from a point considerably above the water level ; a conclusion scarcely borne out in practice : as we find very many engines, both here and in America, getting on without domes ; and supplying steam to the cylinders dry enough to cause no complaint.

"A flush boiler, however, undisfigured by a dome, is, in our opinion, absolutely necessary to that beauty and simplicity of appearance which is such a characteristic of the best class of locomotive. Dry steam may easily be obtained by the use of one or more perforated pipes traversing the upper part of the boiler. By diffusing the draft of steam, and not permitting it to concentrate at any particular place, priming may usually be best avoided, especially if ample water space is provided round the fire-box as well. If this last is constructed with sloping sides, it adds not only to the durability of the plates of which it is composed, but enables the boiler to supply dry steam even with the heaviest loads. Priming is far more due to defective circulation than to anything else ; and with proper attention to the means of providing for this in the best manner, and by the use of perforated pipes, we see no reason why the unsightly and expensive dome may not be banished from our engines."

Hazel Nuts.

Hazel nuts are the fruit of the wild bush of Corylus Avellana, unchanged or unimproved by cultivation. The fruit differs from that of the domesticated varieties only in being smaller, while the tree is more hardy. This plant, which is a native of all the cooler parts of Europe, Northern Asia, and North America, is the parent of the many varieties of nuts and filberts now cultivated for their fruit. The filbert is the fruit of the tubulosa variety of the Corylus Avellana. The term was originally applied to those kinds of nuts which have very long husks ; but owing to the number of varieties that have of late years been obtained, this distinction, which was never scientific, appears to be nearly disregarded, and nuts and filberts are almost synonymous terms, excepting that the wild uncultivated fruit and those varieties which most nearly approach it are never called filberts. In order to preserve filberts in a fresh and plump state, it is only necessary to prevent their parting with their moisture by evaporation. Burying them in heaps in the earth, putting them in earthern jars in a cellar, and covering them with dry sand are all excellent plans. The hazel nut of America is smaller than that of Spain, but it possesses a more pleasant taste, and might be gathered in large quantities in many places. It is however, never gathered like chesnuts for the market, all the filberts and hazel nuts sold are imported. About 182,000 bushels are exported from Spain annually.

The Difference between Man and Ape.

At a recent ordinary meeting of the Anthropological Society (London, Eng.,) a discussion took place on the above-named subject, after the reading of a paper, "On the Brain of a Microcephalic Female Idiot." Professor Owen observed that as the brain of man is more complex in its organization than the brain of inferior animals, it is more subject to injury, and more liable to experience the want of perfect development. Instances of idiocy occur among all races of mankind. Extreme smallness of the skull indicated in all cases want of intellect approaching to idiocy. Alluding to the attempts that have been made to find a link of connection between man and apes, he remarked that it was possible that an idiot with an imperfectly developed brain might wander into some cave, and there die, and in two or three hundred years his bones might be covered with mud, or be imbedded in stalagmite, and when discovered, such a skull might be adduced as affording the looked-for link connecting man with the inferior animals ; but the brain of such an idiot as the female whose skull was exhibited is distinctly different from that of the anthropoid apes ; and he expressed an opinion that the difference is too wide to be bridged over by the skull of any creature yet discovered.

Machinery and Hand Labor.

Not such a great while ago our thread was spun between the thumb and the finger, and all our cloth woven in the clumsiest of hand-looms. Now, by means of a spinning-jenny and weaving machinery, one person will make as much as two hundred yards of cloth in a day. Before the invention of the cotton gin, one person could not prepare one pound of cotton so easily as he can now prepare one hundred pounds. Our grandmothers could barely knit one pair of socks in a day—now, by means of a machine, one little girl can turn out a hundred dollars' worth of knitted materials in a day. A few years ago we were told it took seventeen men to make a complete pin ; now the machine is fed with the raw material, which is not touched again until rolled up in papers of pins. In Providence, R. I., there is to-day a machine that takes a strip of metal from a coil, and makes two hundred and thirty inches of delicate chain out of it, in a day. The metals are no longer worked by hand—a slow wearing process ; they are shaved, sawed, bored and hammered, with the greatest ease and accuracy, as much as if they were of the softest pine.

An instrument has been contrived and perfected of exceedingly delicate powers, which measures the operation of mind itself—tells the exact time it takes for a sensation from the finger to reach the brain—two-tenths of a second ! Go into a certain india-rubber store in New York, and you will find a hundred different articles made of that one staple—only a few years ago good for nothing but to rub out marks, and furnish active jawed young persons something to chew. As wood gives out, coal pits are found everywhere. We begin to fear for lights with which to illuminate our homes, and make all things cheerful ; when lo ! oil is distilled from coal, and we even have streams of it spouting out of the ground for us to fill our lamps with ! Coal tar, once regarded as useless, is now manufactured into many different merchantable articles, some of them of great value.

European Locomotives.

In a paper lately given to the public by D. K. Clark,—superintendent of machinery at the London International Exhibition of last year,—it is stated that there were twenty locomotives altogether exhibited, of which eleven were English, and nine foreign. Fourteen had outside cylinders, and six inside cylinders. Most of the engines were specially constructed for burning coal, a feature which has been introduced entirely since the former Exhibition of 1851. The English engines were mainly examples of the standard classes in general use on the principal English railways. Of the eleven exhibited, seven had outside cylinders and four had inside cylinders. The foreign locomotives showed greater variety and originality of design ; and were mainly constructed for lines with very heavy gradients and sharp curves, which are generally associated together on railways in mountainous districts, causing special mechanical difficulties which do not occur in the case of English railways. The most satisfactory of the plans for surmounting these difficulties is considered to be that of an articulated or bogie engine, having a single long boiler of large dimensions, mounted on separate carriages, with a swivelling connection, each having its own separate pair of cylinders, working six coupled wheels placed near together ; so that the engine, although of great total length, could readily pass round very sharp curves, while the whole of the weight is made available for driving adhesion. A marked feature of the foreign engines is the position of the valve gear outside the cylinders ; but this is considered objectionable in respect of good working and durability. In the large foreign engines as well as in some of the English, the boiler tubes have been crowded too close together, with the object of obtaining a larger extent of surface, from a mistaken idea that heating surface is mechanically the equivalent of evaporative power, without regard to the equally important consideration of the circulation of the water amongst the tubes. Another marked difference between the engines exhibited in 1851, and those shown in this Exhibition, is that, in the latter, Giffard's injectors have been extensively employed, as a substitute for the feed pumps universally used at the former period.

COAL-BEDS.—Heath's mine in Virginia, is represented to contain a coal bed fifty feet in thickness ; a coal bed near Wilkesbarre, Pa., is said to be twenty-five feet thick ; at Mauch Chunk is a coal bed forty to fifty feet deep, and in the basin of the Schuylkill are fifty alternate seams of coal, twenty-five of which are more than three feet in thickness. In Nova Scotia is a coal formation fourteen hundred feet deep, and containing seventy-five alternate layers of coal. The Whitehaven coal mine in England, has been worked twelve hundred feet deep, and extends a mile under the sea, and the Newcastle coal mine in the same country has been worked to the depth of fifteen hundred feet, and bored to a similar additional depth without finding the bottom of the coal measure.

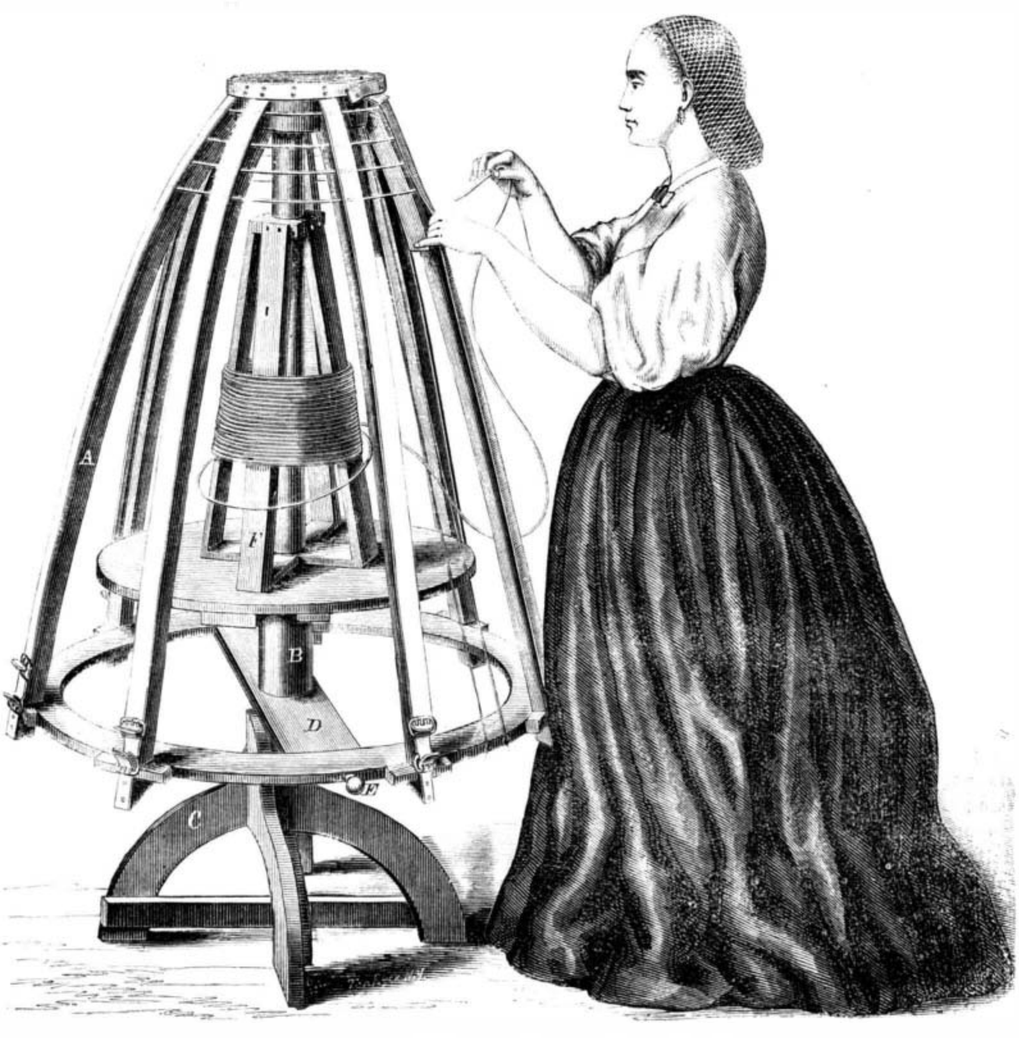
THE national armory in Springfield, Mass., made, in the month of June, 25,000 rifled muskets.

Improved Hoop Skirt Frame.

The close competition which exists in some branches of trade, renders it extremely necessary that no device or expedient which will facilitate business should be left unadopted, This is particularly true of hoop-skirt manufacturing, where the successful prosecution of it depends so much upon the amount and quality of the work an operator is able to perform in a given time. The skirt frame herewith illustrated, is a great improvement upon the old ones in general use; as it occupies very much less room on the floor, and is further desirable in that it combines in itself all that is necessary to finish a skirt quickly and thoroughly.

The frame, A, is mounted on a post, B, and revolves freely about it. This post is fixed in the stand, C, and of course is rigid. The ribs of the frame, A, unite at the bottom in a circular base, which has a cross-piece, D, to center the frame, and also strengthen it; and the cross-piece is retained in its place by the pins, E. The reel, F, on which the hoop wire is wound, is contained within the frame, and also revolves easily about the post, B. These are the main features of the invention.

The objects of it are, that all parts of the skirt, and the materials for making it—such as the wire, tapes, &c., on the frame, convenience for glueing the tapes prior to fastening them permanently with metallic clasps, the arrangement of the wire reel within the frame—are entirely under the operator's eye and hand, and save much time and labor to all. The skirts, when finished, are hoisted up over the frame, and suspended from the ceiling by a cord; this disposition of the work keeps it in perfect shape, and does not displace the tapes, as in the old method of removing the skirts when glued—gathering them up in a mass, and hanging them on the wall. So also with the reel—many advantages are obtained from placing it in the position shown in the engraving, instead of below the skirt frame near the floor, as is the case in other skirt frames, where the clean wire is soiled by dust and glue which drop upon it. It is also feasible to use two different kinds of wire on this reel—a feature which, we are assured, is impossible in ordinary frames. The wire also runs off at a regular and even rate of speed, as it is used by the operator; and is not in the way, nor does it require to be pulled off; but is readily controlled as required. The cross-piece of the frame, at the bottom, may be instantly removed when necessary to fill the reel with wire, or for any other purpose, by simply withdrawing the wooden pins; the frame may then be lifted off clear of the pedestal. These features render this frame a very convenient apparatus. It was patented through the Scientific American Patent Agency, on June 9, 1863, by James F. J. Gunning, of New York city. One half of the patent has been assigned to S. T. and A. T. Myer. Further information can be had by addressing the patentee, at 401 Broadway, New York.



GUNNING'S PATENT HOOP-SKIRT FRAME.

THE OLIER PATENT FOR SECURITY PAPER.

This patent, issued June 9, 1863, to J. P. Olier, of France, was granted for "new and improved methods of making a security paper, to prevent counterfeiting of bank-notes, &c., as well as alteration of public and private writings; and applicable to an opaque pasteboard for playing cards, railway and other tickets." The Olier paper is now secured by patent in all the principal countries of Europe, and has been adopted by the national authorities in several, while pending negotiations promise to extend its utilities still further. It is adopted by the Bank of France, which may be regarded as the mother of this invention; since it was under its direction, supervision, and actuation, and to satisfy its necessities, that the experiments were instituted and carried on, which culminated in success.

The Olier paper is a fabric, distinct in idea, manufacture, and appearance, as well as in its properties, from every other paper previously known. Beautiful in texture and appearance, extremely pliant and durable, and, by its unmistakeable external peculiarity, offering a sure warrant of authenticity; this valuable product of French ingenuity and skill fulfils every condition demanded in a security paper.

The Olier paper is made at the form, by hand; like the paper now used by the United States Treasury Department. It is composed of three layers—a colored enclosed by two white ones—which, being united on the form before drying, constitute a single inseparable sheet. The middle colored layer is the distinguishing feature of the invention; and according to its nature, are the different qualities that adapt it to various uses.

The paper intended for bank-bills, has its interior layer colored with an indelible substance, which resists the bleaching action of acids, and which produces a beautiful and ineffaceable water-mark, or filigraine, resembling an engraving, in the middle of the paper. In the varying thicknesses of this coloring arise the clears and shadows of the drawing, which are distinctly perceptible when the sheet lies horizontally, in a brighter tracery of white than the general surface, and which, on the contrary, are black when the sheet is held vertically. When lying flat, the surface is marked with a distinct drawing, boldly relieved from the general tone of the paper, and exactly similar on both sides. But the grand peculiarity of this paper is, that every effect shown at the surface, is reversed when the sheet is interposed between the eye and the light. This effect cannot be produced except by one process, known only to Mr. Olier. It cannot be imitated by photography—cannot be destroyed by chemical action—defies use—foils imitation—and (so long as one particle of the fabric remains) shows itself as an unanswerable proof that the bill came only from one source, and must be genuine.

The interior layer, when colored with a volatile ink, forms a safety paper, which perfectly opposes any alteration of what may be written upon it. When the ink of the writing reaches the middle layer (which it is sure to do), any agent or solvent, used to obliterate the inscription, instantly decolors the interior coat as well, and leaves an ineffaceable sign of fraud upon the surface. The surface being originally white, no interior color can be introduced when it is once abstracted; and any attempt to erase the writing by scratching, uncovers the middle coat, and leaves a blue or black blotch where the attempt is made. The whole sheet cannot be bleached, for the water-marks, clouded and clear, cannot be restored. At once will be seen the vital interest of this paper to all who desire to execute writings that depend upon their immunity from alteration for their legality. Wills, deeds, bonds, mortgages, certificates, checks, drafts, promissory notes, bills of exchange, and writings of a commercial or public nature, by this paper are secured from fraud.

When the middle layer is thickened and deepened, and enclosed between denser layers, it forms a beautiful white pasteboard, glossy and smooth as ivory; and, no matter how thin, perfectly opaque to the strongest light. Cards may be made from it wholly white, like leaves of ivory, save the face; and since they are formed of a pasteboard throughout, not liable to warp or split, like the ordinary cards, which are composed of two or three sheets, glued together. This pasteboard may also be water-marked, and thus used for tickets, which cannot be counterfeited.

The last branch of this patent includes the production of a commodity not elsewhere found in the trade: *i. e*, a paper made from hemp, wonderfully thin and tough, yet bearing a distinct water-mark, and capable of taking a perfect impression of the finest steel engraving, dry. This is owing to a peculiar ingredient, mixed with the paste. Nothing like this fabric exists in the trade; and its unparalleled strength, pliancy, and durability, as well as its peculiar properties, must speedily make it a desideratum in the useful arts.

Any further particulars may be learned by personal interview with Edmond Gastineau, 21 Pearl street, New York.

Oil Creek Railroad.—The Erie (Pa.) *Dispatch* states that this road is doing an immense business for one of its length. It brings out to Corry not less than 2,200 barrels of oil daily, and its mixed freight going South will average nearly half that amount of bulk. The completion of the road from Titusville to Oil City, is being pushed forward as rapidly as the scarcity of labor will permit. Four miles of the route beyond Titusville are ready for the iron, and the remainder will be graded and the track laid down by the 1st of September next.