Discovery of New Basaltic Columns—A New Giant's Causeway.

The Tuolumne (California) *Courier* thus describes a natural curiosity, lately discovered in its neighborhood :—

A very great excitement among our miners has been caused by a singular discovery made by Messrs. Cochrane, Russell and Lambert, on their claim at Dry Arroya, about a quarter of a mile from Sonora. The gentlemen while "hydraulicing" a stream bank about seventy feet in hight, were suddenly surprised by the caving down of an immense amount of gravel, limestone, boulders and lava, which revealed beyond, in the heart of a high hill, some hundreds of basaltic columns of a dull brown color, pentagonal in shape, and standing perpendicular, from 10 to 21 feet high. The open space between these pillars no where exceeds four or five inches, and rows of them run into the hill from 40 to 50 feet, closely packed together.

In some places, at certain angles, it is possible to see beyond this singular colonnade into an opening formed apparently of quartz rock, which is certainly exceedingly rich in gold; for, even at this distance from the observer, in a kind of dim twilight, strong indications of the metal are distinctly visible. Rays of light seem to penetrate into this opening through fissures in the roof, sides or from the rear, although the most diligent search of hundreds has not as yet led to the discovery of any of them, or of any other avenue through which the light could enter.

The hill is thickly covered with chapparel, which makes the search difficult and unsatisfactory. The well-known geologist of Columbia has been to the spot and examined the place with great attention. He reports that the columns are exceedingly hard, unusually regular in shape, and closely packed together ; that their igneous origin is very apparent, and that on examination he found augite, feldspar, titanic iron and olivin in their composition. He is certain that this is the only instance that so pertect a basaltic development of rock has been found in California—although he has seen as good a development in the West Indies—and he considers it, among all the geological discoveries in this country, as by far the greatest and most worthy of scientific observation. These wonderful natural pillars, interspersed here and there with immense stalactites, indicate a calcareous formation.

THE NEW SPANISH RIFLED ARTILLERY.

[From the London Mechanics' Magazine.]

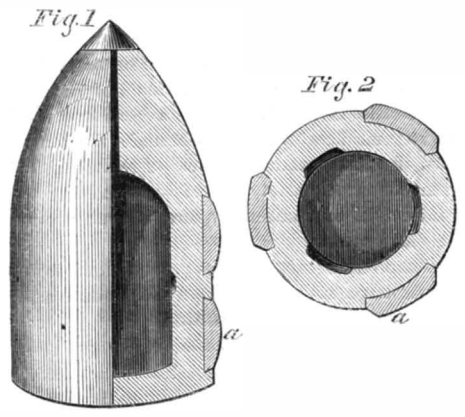
The Spanish government has set an example well worthy of imitation, by publishing the report of the experiments made by the Artillery Committee before deciding on the new system of ordnance, and the reasons given by it for its decision. From these documents it appears that after trying various kinds of breech-loading guns with lead-covered shot like those now in use in England (the Armstong system), a muzzle-loading projectile on very nearly the same plan as the French was found to give better results. A range of 6,600 yards was obtained at 17° of elevation with a 56-pound hollow shell constructed on this system, the extreme simplicity of which the accompanying drawings will render apparent.

The shell is entirely of cast iron, except six buttons of zinc *a a*, which enter the grooves of the gun and give rotation to the shell. As may be supposed, the exact angle for the grooves, the exact length of the shot and position of the buttons best adapted for service, were not ascertained without many trials. At last, however, great certainty of aim seems to have been attained, to judge by the published tables of firing. As to range with practicable angles of elevation, nothing comes up to the reported 6,600 yards with 17°. The nearest approach is by Lancaster, whose 100-pound shell ranged within 1,000 yards as far. Whitworth and Blakely and Armstrong may be able to do more, but we are not aware of their having done it yet.

Captain Blakely, indeed, may claim a great part of the credit of the success of the Spanish artillery, for though the projectile is not his, no guns could be found to fire it with safety but such as are built on his system. The committee reports the trial of many service cast-iron guns rifled, but although the Spanish cast iron is celebrated for its excellence, none stood the great strain produced by firing elongated shot. On the danger of rifling the present stock of cast-iron guns, the committee insists formally in more than one report.

On the 2d January, 1860, it writes:—"Cast iron by itself, as is clearly proved to us by the bursting of the guns we have tried, is not strong enough to resolve the question of rifled cannon of large caliber, unless the charge of gunpowder be much reduced, and even then the gunners would not feel confidence in their guns."

Large iron guns forged in one mass the committee condemns also, and judging by the bursting of the 6-inch forged gun at St. Petersburg a few months ago, and of the 7-inch forged gun at Shoeburyness more recently, we feel inclined to agree in this decision. We hope, however, that wrought iron will not be found as the committee reports it, "without the hardness and other qualities *necessary* to the bore of a gun." If it be really true that guns built up on Captain Blakely's plan, over a central tube of cast iron, are not only cheaper but really better than if the whole mass is of wrought iron, what a mistake England has committed !



The Spanish Artillery Committee asserts that the cast iron center is best, and gives detailed reports of the resistance of several cannon so constucted. We have space for but a few extracts. On the 9th of March, 1859, a comparative trial of a cast iron 32-pounder and a Blakely 32-pounder is thus reported :—

"The results of the proof are the following:—

	No. of rounds with 3 ks. powder.	3½ ks.	4 ks.	Total.
Hooped gun ...	600	200	400	1,200
Gun without hoops --		153	—	152

"The hooped gun is not at all injured. The firing was in the same place, and equal in all circumstances. Seeing this, and taking into consideration the premature bursting of the unhooped guns at Gijon, the committee connot do less than acknowledge the great increase of strength which the hoops supply, and declare themselves convinced that from guns cast of iron, in a single piece, the advantages of the system of rifling cannot be obtained." On the 13th of November, 1859 a Blakely gun, of 16 centimetres bore (6⅜ inches), is reported to have "been fired 900 rounds without suffering even the slightest alteration." On the 4th of September, 1860, another of the same bore, and weighing only 2,835 kilogrammes (about 57 cwt.), is reported as bearing no less than 1,366 rounds, with $28\frac{2}{10}$ kils. (about 60 pound) shells, and charges of 3 and 3½ kils. of powder. "During the first days of proof 100 rounds were fired, with intervals of only from 1 to 1½ minutes. On the following days 50 rounds were fired with the same rapidity every morning, and 50 more every evening. The gun could not be touched with the hand on account of the heat." No wonder the committee thinks that this proof "renders apparent the excellence of the gun, and consequently that of the hooping system."

The final decision of the committee, which has been acted on by the government to the extent of ordering 600 sixty-pounder cannon, we cannot give better than in its own words;—

The path we must follow is clearly indicated : cast-iron cylinders hooped, a most simple manufacture, which, once established, only requires great care in securing the proper diameter to the bore of the hoops. The difference between the diameters of the hoops and of the cast-iron part must be determined by experiment, aided by calculation."

Besides the sixteen-centimeter gun, the Spaniards have rifled guns 4 8-10ths. inches diameter, for siege purposes, and reserve batteries throwing shells of about twenty-four pounds weight. The rifling is very similar to that of their larger guns, with six grooves, however, instead of three. The shells are of cast iron—strong enough to breach masonry—and have each six zinc buttons to take the rifling. The loading is by the muzzle. The reports from which we derive our information contain detailed accounts of experiments with breech-loading cannon, but of none which gave satisfaction to the artillery committee. The lead-coated shot they declare to be uncertain in aim, in consequence of the difficulty of always securing exactly the same difference between its diameter and that of the bore of the gun. Hence, the friction varying ; so does the range.

For field artillery the Spaniards have adopted a caliber of 3 4-10ths. inches, and a shell of about nine pounds. This enables them to use their stock of 4-pounder brass guns. These weigh about 6½ cwt. For mountain service they use the same shells and guns, weighing only 2 cwt.

An exceedingly interesting experiment is reported to test the powers of the new rifled field and siege guns. The fortress of Molina de Aragon was breached in three places by an old smooth-bored 24-pounder, by a 4 8-10ths. inch rifled gun, and by a 3 4-10ths. inch rifled gun. The former opened a breach eleven yards wide, in the ten feet thick wall, in 107 rounds, requiring ten hours. The second made a similar breach in 222 rounds, in fifteen hours ; and the third in 800 rounds, in forty hours.

Taking into consideration the much greater facility of moving the lighter rifled guns than the heavy smooth-bore 24-pounder, the commission unanimously recommend the use of the medium rifled gun for siege purposes. One observation made during this experiment we were not prepared for ; this was the less liability to rupture of the elongated shells than of the round solid shot but of 107 of the latter fired all but five were broken. Out of forty-one unloaded shells only three broke ! Does not this bear on the question of iron-plated ships ?

The Spaniards are now making further experiments, with a view of replacing brass for siege guns, with iron, built upon Captain Blakely's plan. This they are desirous of doing, on account of the destruction of brass when heated by rapid firing. They are also trying steel. We strongly recommend to our readers interested in gunnery to study for themselves the reports we have only had space thus briefly to notice.

English Patents.

The London *Times* gives the following statement concerning the condition and transaction of the English Patent Office :—

In the year 1860 there were 3,196 applications for provisional protection of inventions, and the number of patents actually passed was 2,061 ; in the other 1,135 cases the applicants did not proceed for their patents within the six months. The number of patents that prove useless is very great. The first 4,000 under the new system were granted in 1852-54, all for fourteen years, but liable to become void unless a stamp duty of £50 were paid at the end of three years, and another of £100 at the end of seven years, and of the whole 4,000 only 1,186 paid the £50 duty at the end of the third year, and only 390 the £100 duty at the end of the seventh year; so that nearly 90 per cent were allowed to become void by the end of the seventh year. Still, the stamp duties received last year amounted to £108,000. The fees paid to the Attorney and Solicitor-General and their clerks amounted to no less than $9,621. Abstracts or abridgements of specifications of patents continue to be published, and sold at the cost of printing and paper ; the subjects now in the press are, shipbuilding, preparation of fuel and apparatus for its combustion, steam-engines, weaving, photography, bricks and tiles, and spinning. The Patent Office labors under the prevalent complaint—it has no room, it has books for which there are no shelves, and models which it has no opportunity to exhibit. But the fees have annually produced a surplus, which has now accumulated to the extent of £92,000, so that there is a building fund to begin with.

BRIGHT LIGHTS.—The Drummond light consists of a stream of oxyhydrogen gas burned upon a piece of chalk (carbonate of lime). It has also been called the "oxyhydrogen" and the "calcium light ;" but it is most generally known by the first name, because Lieut. Drummond first applied it practically and publicly in 1826, while conducting the ordnance survey of Scotland and Ireland. The light is very white, and it has been seen at a distance of 90 miles on a dark night. It has oftentimes been proposed for lighthouses, but the electric light is more promising for this purpose. because more simple.

Socialism in Inventions.

[From the London Engineer.]

We should feel pain in believing that the views expressed by Sir W. Armstrong, at Sheffield, respecting inventions and patents, were shared to any extent either by the mechanical engineers or any other class in this country. In so many words he denied the natural right of the inventor to property in his own invention. "Primary ideas," Sir William took occasion to say, "ought to be the common property of all inventors," which amounts, of course, to saying that they ought to be the common property of everybody. "Protection," he went on to remark, "if we are to have it at all, should be sparingly awarded to those persons alone, who, by their labor and intellect, give available reality to ideas." Thus not only is the inventor, or the "mere schemer," as the president of the Institution of Mechanical Engineers chooses to designate him, to be shut out from any exclusive right to his own ideas, but he is, indeed, to be shut out from even a common participation in the benefits resulting from them, since, with all his leaning for communism in such matters, Sir William prefers to grant patents at least to those who have worked out what may be other peoples' ideas into profitable shape. "The merit of an invention seldom lies in the fundamental conception," quoth the same oracle. Does Sir William Armstrong really attach no value to inventions, or does he, like Mr. Denison, Q.C., believe that inventors can no more help inventing than hens can help laying eggs, deeming it as well, therefore, to rob the nests wherever he can find them? We presume the argument relied upon is, that anybody can invent, and that, therefore, monopoly on the part of an individual is a common injustice to all. If this be true it does seem a little strange that it was not until the world had been inhabited for nearly 6,000 years that the steam engine, the spinning frame, the power loom, the locomotive, the steamship and the electric telegraph were thought of. And now, that we think of it, Sir William Armstrong, with whom invention must be easy, has given the world a few proofs of his capacity in that line. He has made an adaptation of a water pressure engine invented and used half a century or more ago, and he has compiled and patented a gun which, whatever its range, is inevitably destined to be abandoned as too complicated and costly for general use; guns of the simplest construction and made of soft steel being absolutely more effective. But it is probably only the intention of the patentee of the "Armstrong" gun, and who has sold his patent to the government for £20,000 down, and "contingencies," to argue that he *could have produced* any one or more of the many inventions for which protection has been granted by the Commissioners of Patents. Possibly it is easy enough to see how we might have made the egg stand upon its end after some Columbus has kindly shown us how. "We see," or, rather, Sir William sees, "numerous cases of disproportionate wealth realized by persons whose only merit has been promptitude in seizing upon and monopolizing some expedient which lay upon the very surface of things, and required no forcing atmosphere of protection for its discovery." Surely Sir William is not here alluding to himself, although we are much tempted to suppose so. If, as is clearly to be inferred from the remark, patents in general are the results of a prehensile faculty by which "expedients lying upon the very surface of things" are exclusively appropriated, why will not Sir William Armstrong be so good as to anticipate all the important inventions of the next half century, and thus (even if taking care to obtain his own patents) cut off all chance of annoyance from other patentees, who might otherwise lay claim to what, even if they were the first to discover it, appears, after all, to be common property? Surely one who is able to speak with such authority as to the facility of invention might render the world this service—so trifling to himself, so vital in its consequences to mankind! Under the inspiration of Sir William's logic, what a trumpery idea does that of Watt appear as to the separate condenser, that of Cort as to the rolls and puddling furnace, that of Arkwright as to the spinning throstle, that of Millar and Symington as to steam navigation, that of Winsor as to gas purification, that of Howard as to boiling saccharine fluids in *vacuo*, Neilson's crochet of the hot blast, Roberts's contrivance of the mule, Stephenson's locomotive, Wheatstone's pins for arresting the needle, which Oersted had shown, nearly twenty years before, *must* be deflected, and finally, the idea of Armstrong's unskillful and complicated gun! These were fundamental ideas, all of them, and for which, erroneously it would now appear, mankind have been content to applaud those who conceived them.

Mr. Brunel always held that a gift of two guineas was ample remuneration for a workman who had schemed a good thing. What munificence, then, had it been on the part of Lord Derby to have handed a five pound note to the plain Mr. William Armstrong, of Elswick, in 1858, as full reward for the scheme of the gun of which each costs, it is understood, £2,000 to make! We say this with no desire to detract from the merits, whatever they may be, of that contrivance. An inventor and patentee, who holds all other inventions so lightly, may, however, confess to the shallowness of his own. For if it be true that Sir William is really an inventor, his beloved country has much reason for praying that he will invent no more.

Sir William can only explain away the inconsistency that, while he is decrying patents, he is himself a patentee, by urging that manufacturers are compelled to patent their own ideas in order to be enabled to work them, as they would else be seized upon and patented by others. Whether from inadvertance, or otherwise, this excuse is based upon a falsehood. No man need patent an idea, or a machine embodying an idea, for the mere purpose of preventing its being patented by others. Had Sir William, instead of patenting his modification of the old water-pressure engine, at a cost to himself of some hundreds of pounds, published to the world the same specification as a book, and at one-tenth the outlay, he would have effectually shut out all chance of his plans being exclusively appropriated by any one. Watt, Arkwright, Bramah, Cort, Hargreaves, Winsor, Howard, Sir Samuel Bentham, Brunel, Neilson, Roberts, the Stephensons, Wheatstone—indeed nearly all inventors of note—have elected, however, to patent their ideas, notwithstanding that they could have made them the common property of all by simply publishing them in full to the world. Had there been no patent laws these inventors would not have had the same motive for invention, unless upon Mr. Denison's idea, invention is the involuntary exercise of a natural function. Why are not the Swiss inventors? Their ingenuity (which is not invention in itself) is everywhere admitted. Switzerland has no patent laws, but an ingenious Swiss, Mr. Bodmar, when he came to this country, made a multitude of inventions and took out a great number of patents. Without patent laws the "prestige," as Sir William chooses to call it, of "successful invention," would be a mockery, and, upon the assumption implied in his remarks, that there is no merit in mere invention, there would, indeed, be no chance of "prestige," whatever that may be. But we have not argued, nor shall we seriously do so, the question of the merit of invention with one whose perceptions in that respect appear so oblique as do those of Sir William Armstrong. Whether known as an invention or discovery, the enunciation of an original idea, capable of embodiment in mechanism for the advantage of mankind, has long been, and, we hope, long will be, esteemed as meritorious and deserving of reward in proportion to the value it may be made to yield. The merit being admitted, it is but justice to reward it, either by a grant of money, or by that of a limited monopoly of the invention itself. It is incumbent upon no man to invent for another, unless he be paid for his pains, and yet Sir William would confiscate the invention, holding that "primary ideas" should be common property, just as a furious mob might say the same of Elswick factory. When the time shall have arrived for withholding all reward from inventors, whose thought is of the highest order of merit, the occupation for brains will indeed be gone. Is there no fear that, were that time to come, the thinkers would begin to ask by what right property was held at all, and why it was not divided in common? The communism desired by Sir William might then take a different and unexpected shape.

The first inventor is, clearly enough, the one to whom reward for the invention is due. And fourteen years, in any case, is the longest term for which the inventor, rewarded by a patent, can set up his claims in the way of any one. Many patents lapse at the end of six months, a much larger number at the end of three years, and a considerable share on the expiration of seven years from the date of issue. It is idle to say that the progress of inprovement is being obstructed by the existence of patents of no practical value. These very patents, most likely, which Sir William would thus characterize serve to provoke fresh inventions of a class to supersede them. And, besides, it is natural that one who denies the right of property in invention should complain of the abstructiveness of all patentees. The Armstrong gun and its projectile have been compiled from the inventions of a number of ingenious men. Mr. Rothwell Jackson, as long ago as 1834, patented the coil arrangement of wrought-iron rings for hydraulic press cylinders, Captain Blakeley, too, patented it for guns before the then Mr. Armstrong. A Mr. Benson claims the important feature in the construction of the shell, and Mr. Whitworth has had occasion to point out, before the Institution of Civil Engineers, one or two instances, furnished by the Armstrong gun, of infringement upon his own plans. Is it, therefore, manly and fair for one, who, with the results of so much eclecticism in his favor, has had the public purse almost at his own disposal, now to raise an outcry against those to whose efforts he owes so much? Not content with appropriating the ideas of others, right and left, he would have the larceny legalized by the world. We think that we can congratulate inventors that, under all the circumstances of this attempt to strip them of their property, it will not have the slightest chance of success. It is not less for the interest of the public at large than for that of inventors themselves, that their rights should be sacredly respected. They give infinitely more than they receive; and even if all considerations of justice were set aside, it would, we apprehend, prove to be the worst policy to withhold from them the only encouragement which they now have to exertion. From the unjust and ungenerous detraction of Sir William Armstrong, from whom inventors had every right to expect appreciation and sympathy, they have little to fear.

New Flax Company.

At a public meeting in Lockport, on the 19th ult., the establishment, in that village, of the American Flax Company was announced. Hon. Samuel B. Ruggles made some remarks at the meeting, in which he represented the importance of Lymans invention for cheaply extracting from flax a fiber capable of being substituted for cotton, at least to a considerable extent. We quote from the Lockport *Journal*:—

Mr. Ruggles dwelt earnestly on the importance of developing this new branch of industry, not only in increasing the trade and revenue of our canals and opening new sources of agricultural wealth, but its far higher influence in securing to the Northern States, and to Europe, comparative independence from "cotton domination," with which the world has been threatened.

Among the many interesting statistical views which he presented was the dominant fact that the price of the flax fiber, thus produced and ready for use, would fall far short of the present price of cotton, probably not exceeding eight, and certainly within ten cents per pound.

In the assumption that an acre of land will produce 1½ tuns of flax, (on which point, however, he asked the meeting to procure more accurate information,) that each tun will produce 300 pounds of fiber, every acre of land thus employed would yield a bale of 450 pounds of fiber. He expatiated on the immense agricultural capacity of our neighboring States North of the Ohio, and the high political importance of this homogeneous culture, as riveting still more strongly the union, at least, of the Northern States.

Ex-Governor Hunt also made a speech on the occasion, setting forth the objects of the company, and we learn that a factory will either soon be engaged or a new one built. The fiber obtained by this process is mostly short, but good, and is capable of being used with great advantage in the manufacture of mixed woolen goods. We have always been the constant advocates for the cultivation and manufacture of flax and flax fabrics in America.

Our people should not expect to obtain flax as cheap as cotton. We are confident that flax of as long fine fiber as cotton would be cheap at almost double the price of cotton, because it makes such superior cloth.

WHITE lead and litharge mixed together in nearly equal proportions with boiled linseed oil so as to make it of the consistency of putty, forms a good cement for joints of steam pipes. This is also a good cement for water cisterns, when mixed with about 10 per cent of dry white sand.

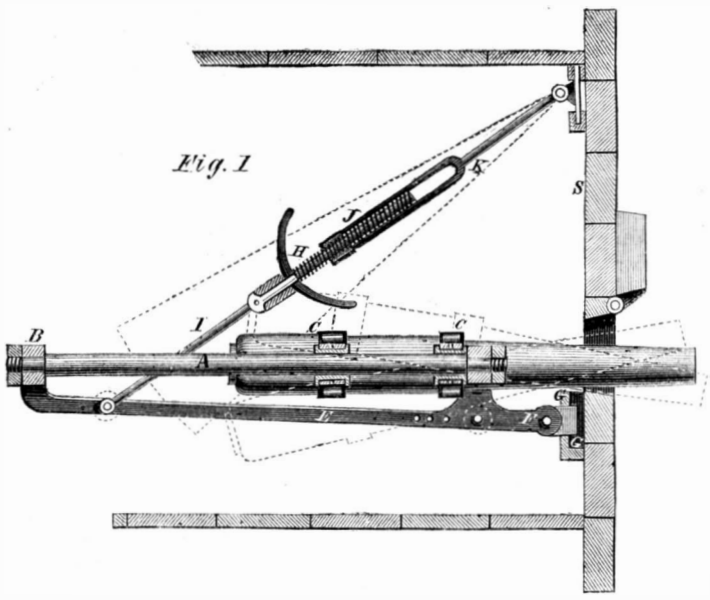
Slinging and Working Guns.

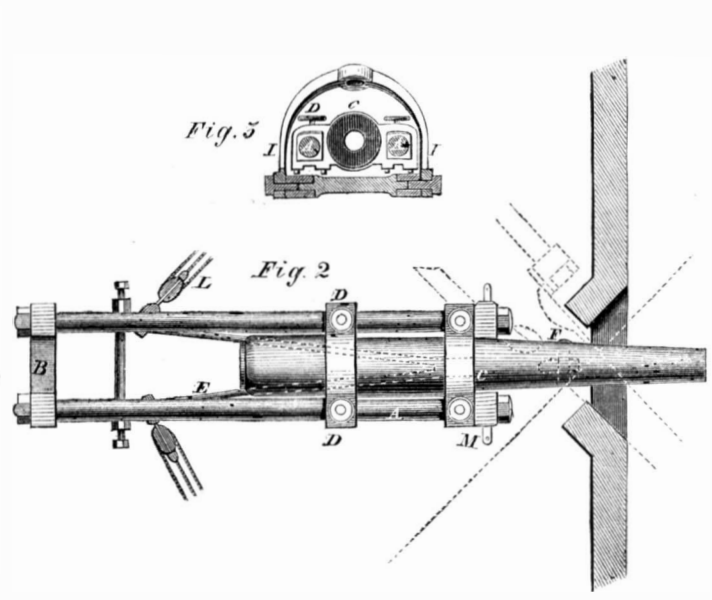
The accompanying engravings represent an important mode of slinging and working guns, invented by Scott Russell, of London. Its object is to reduce the size of the portholes and embrasures. The guns are between decks with the portholes open, and they are mounted on and between guide bars on which they are capable of sliding, there being india rubber springs used to receive the recoil consequent on the discharge. A nipping apparatus is also employed for increasing the friction so as to resist the backward motion of the gun. This is most conveniently accomplished by an inclined surface which is caused to bear tightly upon one or both of the bars. The hinder ends of the two bars upon which the gun slides are connected by a crosshead, which may be supported from above, or it may be supported upon a sledge, or upon wheels resting upon the deck. The breech end of the gun with the bars upon which it slides are elevated and lowered as may be required.

Fig. 1 shows a vertical section, and Fig. 2 a plan, partly in section of the arrangement preferred when a gun is mounted between two bars; and Fig. 3 shows a tranverse section taken near the ends of the two bars.

A A, are two bars which are connected at the ends by a crosshead, B, and at the other end the bars are connected by a crosshead or bar, which is hollow for the under side of the gun to rest on; the gun is also supported in and connected with the two rods or bars by two slides, C C, which at their ends embrace the two bars, and there are friction surfaces which are acted on by the screws, D, so as to offer any desired friction according as the screws, D, are more or less screwed up.

These bars are arranged to move freely up and down and to and fro horizontally, and it is by such movement of the bars that the pointing of the gun is obtained. E is an under framing to the bars, which at one end is connected to the crosshead, B, and at the other end to the crosshead under the gun. The end of the frame, E, together with the bars, A, pivot on the horizontal axis, F, and the vertical axis, G, as shown; but in place thereof the bars might be connected to a ring carried by vertical and horizontal axes or gimbals, so as to obtain similar motions of the bars, A, together with the gun. In the arrangement shown, a screw, H, connected to a forked connecting rod, I, is used to raise and lower the breech end of the gun; such screw working in a screw nut, J, carried by a suspending or radius rod, K; but tackle may be used above the gun, as tackle is used on either side of the gun at L L. In addition to the friction surfaces acted on by the screw, D, spring buffers may be used behind the gun and between it and the crosshead, B. Tackle is also applied at M M, to run out the gun. In thus supporting a gun on bars it is not essential that the bars should be so arranged as to admit of the gun being placed between them, as a gun may be carried by and slide on a bar or bars otherwise placed, so long as such bars are arranged to pivot with the gun, as described.





SLINGING AND WORKING GUNS.

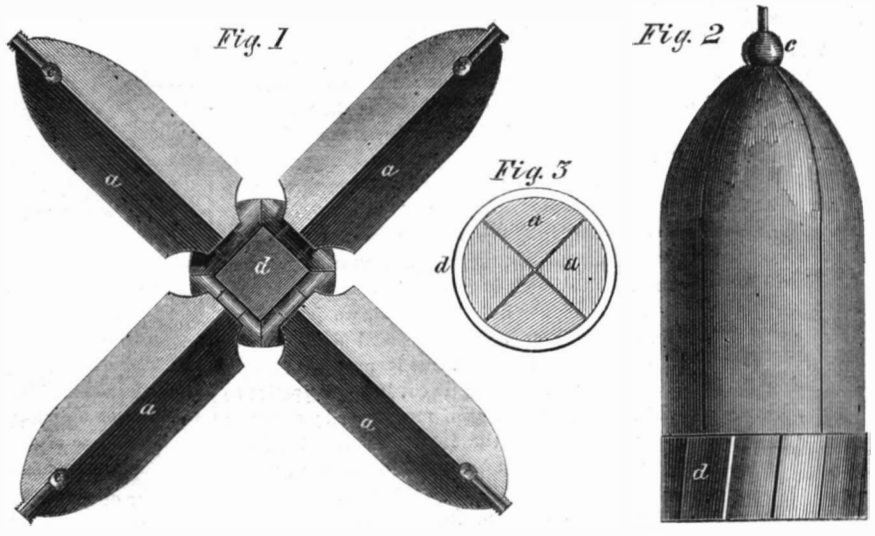
Improved Expanding Projectile.

New ideas in regard to weapons of war continue to come forth from the fertile brains of our thinking people in vast numbers. The novel invention here illustrated is but one of the many which have been developed by the war. A shot is made in four sections, hinged at the breech, and carrying a fuse with a charge of powder so arranged that at the proper time in the flight they will be thrown apart in the form represented in Fig. 1; thus increasing the breadth of their destructive track.

The four sections, *a a a a*, Fig. 1, are made of cast iron, and are connected by simple hinges to the breech-piece, *b*, also of cast iron. When brought together they form the acorn-shaped shot represented in Fig. 2; the button, *c*, being screwed around the projections on their ends to hold them together. They are also further confined by the soft metal cup, *d*, around the base, this cup serving to fill the rifling, thus closing the windage and giving the spiral motion to the shot. A cavity, *e e e e*, is formed in the shot near its apex to receive a charge of powder, which is connected with a fuse leading outward, to be fired at the discharge; and when the fuse has burned in to the cavity, *e*, it fires the powder in the cavity and throws open the shot in its expanded form.

Each of the sections, *a a a a*, is made hollow, and is filled with powder to act as a shell. A fuse leads from this central charge of powder to the cavity, *e*, so that when the powder in the latter is burned it kindles the fuse and this conveys the fire to the central charge, exploding the shell. Fig. 3 is a cross section of the projectile, showing the shape of the sections. The shell may be made in 2, 3, 4, or more sections; and the lengths of the fuses must be adjusted to the times of flight.

It will be seen that this shot cleaves the air with the ease of the ordinary elongated projectile; at the desired point in its flight throws out its wings, cutting a wide path of destruction; and finally explodes into a multitude of fragments, scattering death in every direction. A shot 4 inches in diameter measures 20 inches when expanded.



GAULT'S EXPANDING PROJECTILE.

The patent for this invention was granted to the inventor, John Gault, of Boston, Mass., through the Scientific American Patent Agency, July 2, 1861, and further information in relation to it may be obtained by addressing George R. Jackson & Co. (to whom an interest in the invention has been assigned) at their iron works, 201 Center street, New York. This firm is prepared to manufacture the projectiles in any quantity.

Machine Barber.

A patent has lately been applied for in England by Tom Bromwich, of Bridgenorth, Salop, for a machine for cutting the hair of the human head—a capillary abridger by which Monsieur Tonson's "occupation is gone." Its object is stated to consist in combing and cutting the human hair at one operation. A comb, consisting of a flexible steel blade is made to pass under the hair and hold it to the action of a pair of scissors which follow the bend and motion of the comb. To all barbers who desire to engage in hair cutting upon a scale extensive as their loftiest ambition, we recommend Jenkins's American Sheep Shearing Machine, illustrated on page 129, Volume XIII., Scientific American (old series). It will beat that of Tom Bromwich or any kindred machine in old England "all hollow."

Massachusetts claims to have constructed the first railroad and the first canal in America. The Middlesex Canal, uniting the Merrimac river with Boston, was finished in 1808. It formed the model of the New York and Erie Canal. The Quincy Railroad, having train rails and operated by horses, was the first railroad. It was opened in 1827. The railroad between Albany and Schenectady, N. Y., is the first upon which passenger steam locomotives were used.

No less than eighty million forty-two thousand six hundred and ninety-eight tuns of coals were raised from the mines in Great Britain in 1860.