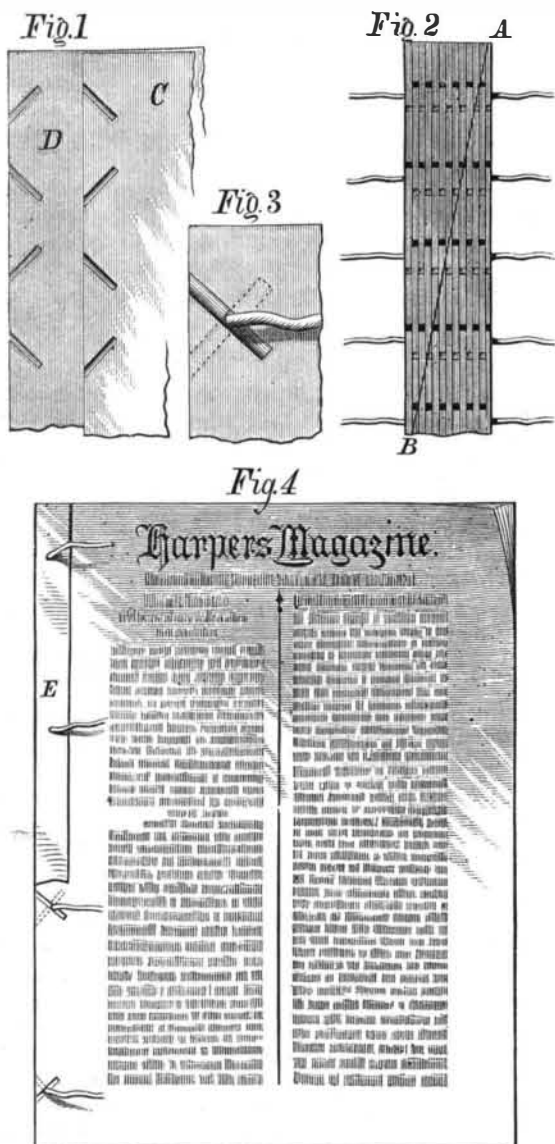


A NEW METHOD OF BOOKBINDING.

The annexed engravings represent a new system of binding books, for which a number of important advantages are claimed. It obviates stitching, allows of each leaf being firmly secured, and hence is especially well suited for single-leaved books. It admits of plates and maps being bound in their proper places instead of being pasted in, and renders the book much stronger and more durable. The inventor claims a saving of 40 to 75 per cent of the time required for stitching, and of 50 per cent of the time needed in ordinary rebinding work.

The mode of operation is as follows: On receiving the sheets, the binder folds them and places them in consecutive order, according to the printer's signature. The front and bottom edges of the book are then trimmed so as to obtain two straight sides; and the backs of the sheets are cut off, transforming them into single leaves. Horizontal lines are now marked with pencil across the back of the book for the saw cuts; and a diagonal line, A, B, Fig. 2, is drawn to serve as a guide in replacing the leaves in their proper places. A thin coat of glue is next applied to the back; and when this is dry, the book is divided into sections of from four to eight leaves (without counting them) entirely disregarding the printer's signatures, but placing the sheets in their original order. The binder places the first section removed at his right hand, the next at his left, and so on,



forming two piles. Each pile is then straightened, and in the back of each, a little below the transverse lines, are made bevel cuts with the saw. Said cuts are $\frac{1}{4}$ inch in length, inclined at an angle of 45° , and so placed that one half their length is above and the other half below the marked line. When one pile of sheets is thus sawn, the other pile is similarly treated; but the corresponding cuts are made at relatively opposite angles. This will be understood from Fig. 1, in which C represents the edge of the right hand pile, for example, and D that of the left hand pile.

The sections of each pile are now returned in their regular order, according to the printer's signatures. Should a section have been misplaced, the diagonal line, being thus broken, will show the fact. It will be seen, however, that this arrangement involves the alternate use of sheets from each pile, so that, when all are put together, the beveled cuts will cross or form dovetails, as shown in Fig. 3. Half inch strips of white paper muslin, E, Fig. 4, are next pasted around the back edges of the first and last sections. This is done to strengthen the hold of the twines in the back of the book, said sections necessarily bearing the whole strain of the covers. The twine used corresponds in size to the holes made by the coincidence of the beveled saw cuts. This twine is passed through the holes by means of a blunt darning needle. The back of the book is shown in Fig. 2; and in Fig. 4 the twines are represented as passed. Nothing further remains to be done but to paste in the fly-leaves and lining, and finish the book in the usual manner.

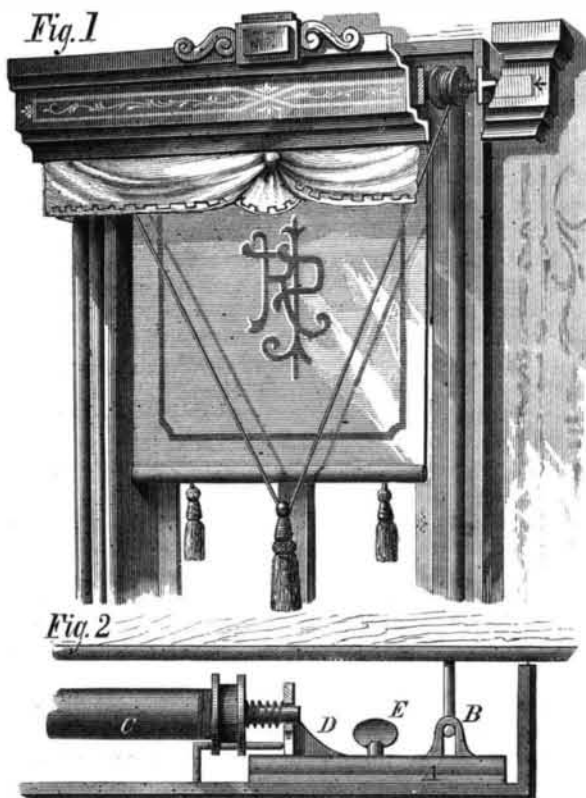
It is evident that this is a very much stronger method of securing the leaves than that in which the twine is simply laid and glued in a straight cut. Each leaf is independently

fastened; and the thread is prevented from cutting through, as is commonly the case when the book has been used to any great extent. Books can be bound to open more or less as desired; and in rebinding, instead of taking the book apart and cutting threads, a thin shaving is sliced off the back, and the leaves are treated in the manner already described.

Patented March 20, 1877, by Mr. Florenz E. Schmitz. For further information, address Messrs. Schmitz and Slosson, box 1180, Middletown, Orange county, N. Y.

IMPROVED CURTAIN FIXTURE.

We illustrate herewith an improved curtain fixture, which may be adjusted to windows or curtains of different widths, and is adapted for use in connection with different means for raising and lowering the curtain. Fig. 1 represents the device in place, a portion of the cornice being broken away to exhibit it; and Fig. 2 shows the same in detail.



Attached to the cornice are guides, A, in which are sliding loops, B. The latter may be adjusted to suit the position of the hooks placed in the window case to sustain the cornice, so that said hooks need not be set with any particularity. The curtain roller, C, has both its ends screw-threaded, to receive hollow pulleys, as shown. The spindles projecting from these pulleys are inclosed in coiled springs which press against the bearings, D, and so hold the shade in any position in which it may be placed. The bearings, D, are clasped in the ways, A, and are laterally adjustable. Sliding blocks are also arranged in said ways, and through each block passes a set screw, E. It will be perceived that the bearings may be readily adjusted to curtains of different widths, and the parts may afterward be locked in position by the set screws, E. The curtain may be raised or lowered by cords wound on the hollow pulleys.

Patented December 5, 1876, by Mr. R. J. Pospisil. For further particulars relative to sale of patent, address the Penn Patent Agency, 133 South Second street, Philadelphia, Pa.

BOOT AND SHOE MACHINERY.

No manufacturers have taken greater advantage of the ingenuity of the mechanical engineer than the American

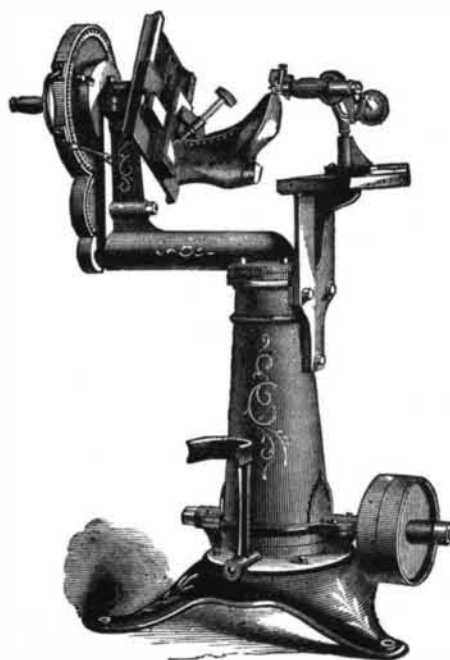


Fig. 1.

boot and shoe makers. Nearly every operation in the complex process of evolving finished boots from the plain skins

of leather is the object of a special class of machinery; and for several years past, we have weekly chronicled the patenting of several improvements in the devices for effecting some of the numerous operations. We present herewith a series of eight labor-saving machines of the most approved construction, which we select from Knight's "American Mechanical Dictionary."*

Fig. 1 is a shoe-edge trimmer, in which the shoe is mounted on a jack, the carriage of which has a motion of translation and rotation communicated to it: so that, while the side of the sole is being trimmed, the shoe is fed longitudinally against the knife, but at the toe and heel is rotated beneath it. The knife is universally jointed, to permit the hands of the operator to determine the different bevels cut.

Fig. 2 is an ingenious little machine for placing the eyelets of the lace holes in position, and fastening them. The eyelets are fed, one by one, from the reservoir at the top, down the inclined ways, and are seized at the foot between the plunger and anvil, and they are riveted in their proper places in the shoe or strip of leather, which is held and fed by the operator.



Fig. 2.

Fig. 3 is a machine in which a shoe or boot is chucked and revolved against a burnishing tool, to impart a smooth and elegant finish to the heel. Our engraving shows a machine with what is called in the trade a "hot kit," a heated burnishing tool, with a flexible gas pipe of sufficient length, which follows the oscillations of the burnishing stock, a, and which conveys gas to the interior of the tool, where it is burnt in a jet. The tool is made to reciprocate over the surface of the heel, passing from breast to breast at each oscillation with an elastic pressure.

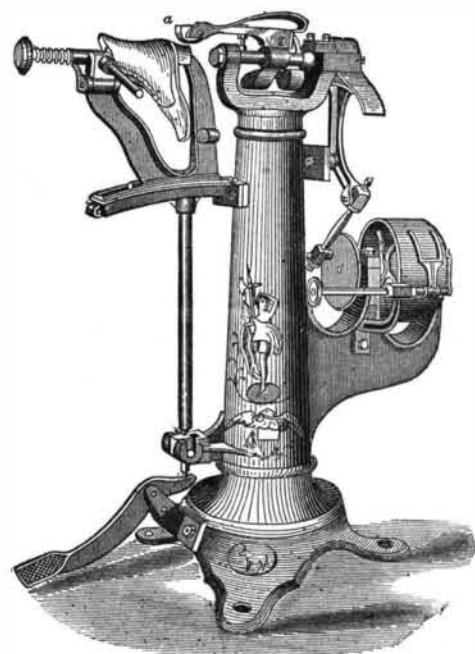


Fig. 3.

Fig. 4 is a machine for pressing together the "lifts" which compose a boot or shoe heel, thus dispensing with the handiwork of the hammer and lapstone. The bed is adjusted vertically by a screw to any thickness to which the blank heel may be built; and the plunger is brought down by the depression of the treadle with such force as to compact the lifts together.

Fig. 5 shows a heel-pricking machine. When the lifts of the heel are fairly pressed together by the appliance shown in Fig. 4, the pricking machine pierces the necessary holes through all the lifts at once by a gang of awls. The compressed heels are first secured together by tacking, and then placed on the platen; and the plunger, with its gang of awls, descends with great force.

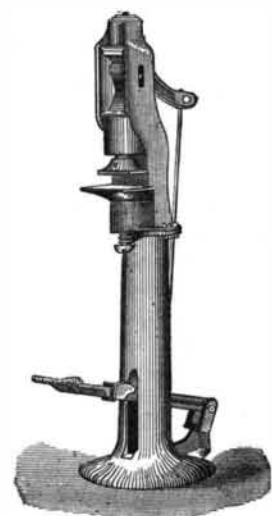


Fig. 4.

Fig. 6 is a heel trimmer, known in the trade as the Coté trimmer. The shoe is held stationary by the treadle clamp; and the knife stock, which is centrally pivoted to the outer plate or jaw bearing upon the tread lift, is then grasped in the hands of the operator, and moved to give a sweeping cut to trim the heel.

Fig. 7 is a machine for pressing boot soles. Beneath the

* Published in numbers by Messrs. Hurd & Houghton, New York city.

crosshead of the press is a swinging bed, on each end of which is a form, in order that a shoe may remain under

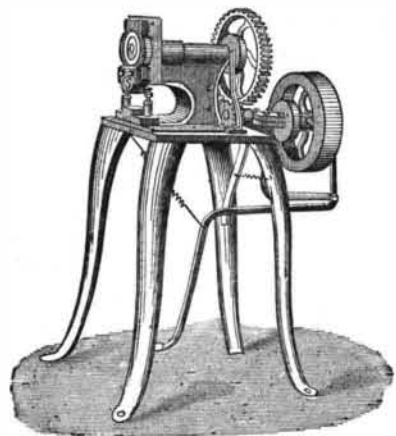


Fig. 5.

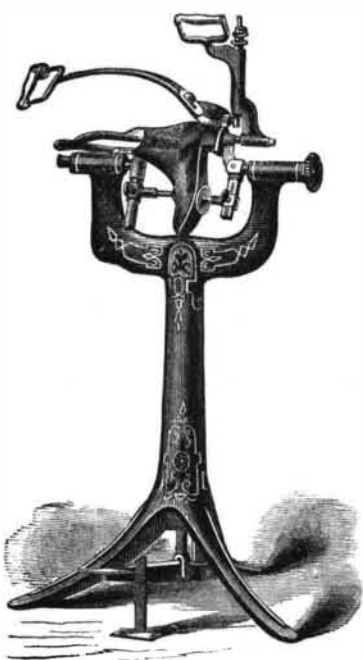


Fig. 6.

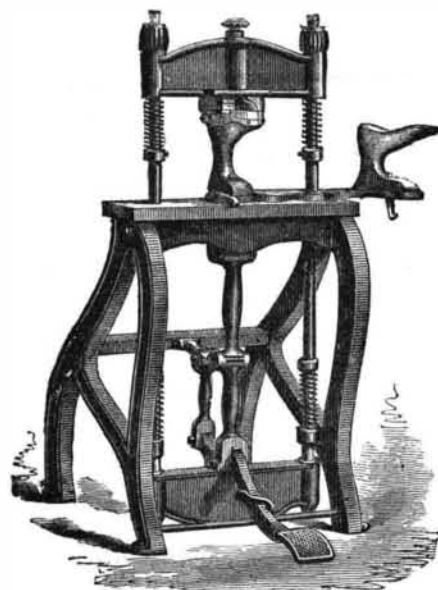


Fig. 7.

pressure upon one while the operator is placing another shoe on the other. The pressure is given by the treadle, which brings down the upper platen on the channelled sole.

On Dyspepsia.

At a late meeting of the Harveian Society, of London, Dr. Farquharson read a paper on this subject.

Attention was directed to the state of the tongue in dyspepsia. A deeply fissured tongue often meant little; whereas a thin white fur, composed of minute dots, was generally found along with pain immediately after food. Pain after a longer interval was accompanied by a pale, flabby tongue, with reddish tip and center. The treatment of dyspepsia consisted of two parts, that of food and that of drugs. The latter was the principal part with patients applying for gratuitous relief. The pain occurring immediately after food was usually relieved by alkalies; whereas acids were indicated where suffering was not experienced until an hour or two after the commencement of the digestive act. For the relief of the nausea and sickness remaining after the bowels were thoroughly cleansed, nothing was so effectual as hourly drop doses of ipecacuanha wine. Nux vomica was also a valuable remedy. Pain might be but the protest of the stomach against an overload, or be the result of deficient tone from general nervous exhaustion. In some cases each meal was followed by diarrhoea; and for these cases attention was directed to Ringer's plan of minute doses of the liquor hydrargyri perchloridi. In speaking of diet, Dr. Far-

quharson pointed out that there are three forms of dyspepsia: 1. The dyspepsia of fluids, as it is called, where the stomach seems intolerant of all forms of fluid; 2. The digestive derangement following intemperance in the matter of animal food; and, 3. The dyspepsia connected with indulgence in tea, or other warm and weak infusions of tannin.

The Destructive Effects of Lightning.

The amount of destruction of life and property by lightning, or rather electrical discharges, has been very great throughout the world.

It is estimated that at least 45 persons are killed annually by lightning in this country. The average number of deaths by lightning has been 22 in England, 9 in Switzerland, 3 in Belgium, and 75 in France. In France alone, during a period of thirty years, over 10,000 persons were smitten, of which 2,252 were instantly killed. Eighty were wounded and 9 killed during one thunderstorm at Châteauneuf les Montiers in 1861, and within one week, when the air was highly charged with electricity, thirty-three fearful flashes of lightning were observed, each bringing death to some victims.

During the sixteen years between 1799 and 1816, 156 vessels of the British navy were struck by lightning; 73 men were killed and 138 injured, and the loss of materials amounted to over a million dollars; but since the system of metallic conductors, adapted for vessels, devised by Sir W. Snow Harris, has been applied to the vessels in that navy, the losses and damages by lightning have almost entirely ceased, although the number of vessels has been greatly increased.

In Fuller's Church History it is stated that "scarcely a great abbey in England exists which once, at least, was not burned down by lightning from heaven."

On the night of April, 1718, twenty-four steeples were struck along the coast of Brittany; and on the 11th of January, 1815, twelve steeples suffered a similar fate in the Rhenish provinces.

On the 27th of July, 1759, lightning burnt all the woodwork of the great cathedral at Strasbourg; and on the 14th of August, 1833, it was struck three times within a quarter of an hour, and so much damaged that the repairs cost about \$6,000,000. In 1835 lightning conductors were placed upon the building and steeple, and since then it has not been damaged whatever by lightning, although discharges have on several occasions occurred in line with the top of the steeple, which is 437 feet above the ground.

On the 18th of August, 1769, the Tower of St. Nazaire, at Brescia, was struck, and the subterranean powder magazine, containing 2,076,000 lbs. of powder, belonging to the Republic of Venice, was exploded. One sixth of the whole town was laid in ruins and the rest very much injured, and about 3,000 persons killed.

On the 26th of June, 1807, the powder magazine of Luxembourg, containing 28,000 lbs., was struck, and besides about 30 persons killed and 200 injured, the town was ruined.

Explosions and large fires, involving a great loss, have become rather frequent in this country, owing to the iron tanks used for the storage of petroleum being struck by lightning. From March to August, in 1876, over 10,000,000 gallons, and on April 19, 1877, over 2,000,000 gallons of oil, and the village of Troutman, were destroyed in the oil regions of Pennsylvania.

Some of the thunderstorms which have prevailed in this country have been very terrific and destructive. During August 14th, 15th, and 16th, 1872, portions of New York State and the New England States were visited by some of the most terrific thunderstorms ever experienced, during which over 200 dwellings were struck and damaged, about 10 persons were instantly killed, and 160 stunned. Quite a number of barns, with their contents, hay and cattle, were also struck, fired, and consumed. Cars, while running on some of the railroads, were surrounded by a vivid electric light, but no passengers were injured, although they were greatly alarmed. Telegraph wires were melted by the half mile, telegraph instruments broken, and poles shattered in all directions. One of these storms occurred at midnight, at Arlington, Mass., August 14th, in which brilliant streams of electricity darted across the sky in every direction, and the thunder which followed was constant for a period of thirteen minutes, without the intermission of an instant of silence. Three hundred and thirty-one discharges were counted in seven minutes by an observer, and each discharge was followed by loud and sometimes rattling reports, whose reverberations rolled through the heavens in an endless procession of majestic and terrific sounds. During this scene, the moon, which was about half an hour above the western horizon, was visible, but so magnified, through the haze and vapor, as to appear like a brilliant flame suspended in the sky. For a period of twenty minutes the scene was one of grandeur and sublimity rarely witnessed.

In the States of Illinois and Iowa, and the prairie country west of the Mississippi river, thunderstorms are generally more terrific, and more lives have been lost there from the effects of lightning than in any other section of this country. Owing to the said country being level and devoid of trees, the equilibrium between the electricity of the atmosphere and that of the earth is principally restored by disruptive discharges.—Spang's "Treatise on Lightning Protection."

A TOOTH of a mastodon has been dug up near the Ashley river in South Carolina. It is 11½ inches long, 6 inches in diameter, and weighs more than 5 lbs.

The Sea Serpent Sighted from a Royal Yacht.

The Osborne, paddle royal yacht, Commander Hugh L. Pearson, which arrived at Portsmouth from the Mediterranean on Monday, June 11, has forwarded an official report to the Admiralty, through the Commander-in-Chief (Admiral Sir George Elliot, K.C.B.), respecting a sea monster which she encountered during her homeward voyage.

At about 5 o'clock in the afternoon of June 2, the sea being exceptionally calm, while the yacht was proceeding round the north coast of Sicily toward Cape Vito, the officer on the watch observed a long ridge of fins, each about 6 feet long, moving slowly along. He called for a telescope, and was at once joined by other officers. The Osborne was steaming westward at ten and a half knots an hour, and having a long passage before her, could not stay to make minute observations. The fins were progressing in an eastwardly direction, and as the vessel more nearly approached them, they were replaced by the foremost part of a gigantic monster. Its skin was, so far as it could be seen, altogether devoid of scales, appearing rather to resemble in sleekness that of a seal.

The head was bullet-shaped, with an elongated termination, being somewhat similar in form to that of a seal, and was about six feet in diameter. Its features were only seen by one officer, who described them as like those of an alligator. The neck was comparatively narrow, but so much of the body as could be seen, developed in form like that of a gigantic turtle, and from each side extended two fins, about fifteen feet in length, by which the monster paddled itself along after the fashion of a turtle.

The appearance of the monster is accounted for by a submarine volcano, which occurred north of Galita, in the Gulf of Tunis, about the middle of May, and was reported at the time by a steamer which was struck by a detached fragment of submarine rock. The disturbance below water, it is thought probable, may have driven up the monster from its "native element," as the site of the eruption is only one hundred miles from where it was reported to have been seen.—Portsmouth (Eng.) Times.

Sunstroke.

The sudden accession of heat has already produced one fatal, and more than one severe, case of sunstroke in the metropolis. Probably the affection so designated is not the malady to which the term *coup de soleil* can be properly applied. The condition brought about is an exaggerated form of the disturbance occasioned by entering too suddenly the "hot" room of a Turkish bath. The skin does not immediately perform its function as an evaporating and therefore cooling surface, and an acute febrile state of the organism is established, with a disturbed balance of circulation, and more or less cerebral irritation as a prominent feature of the complaint. Death may suddenly occur at the outset of the complaint, as it has happened in a Turkish bath, where the subject labors under some predisposition to apoplexy, or has a weak or diseased heart. It should suffice to point out the danger and to explain, by way of warning, that although the degrees of heat registered by the thermometer, or the power of the sun's rays, do not seem to suggest especial caution, all sudden changes from a low to a high temperature are attended with danger to weak organisms. The avoidance of undue exercise—for example, persistent trotting or cantering up and down the Row—is an obvious precaution on days marked by a relatively, if not absolutely, high temperature. We direct attention to this matter because it is obvious the peculiar peril of overheating the body by exertion on the first burst of fine weather is not generally realized. It is forgotten that the increased temperature must be measured by the elevation which has recently taken place, not the number of degrees of heat at present recorded. The registered temperature may be more or less than that which occurred a year ago; but its immediate effects on the organism will be determined by the conditions which have preceded it and the violence of the change.—Lancet.

Dead Horses Standing Erect.

The Danville Advertiser of the 7th inst. says: Mr. Smith was in town on Saturday with his hired man, and the two tell a singular story about a lightning stroke. Mr. Smith was on a grain drill in a field, and his hired man was about 12 rods from him, dragging. Suddenly Smith heard the noise of thunder, and became unconscious. The man also heard the noise, but neither of them saw any flash of lightning. The man went to Smith, and in about twenty minutes he was restored to consciousness. Then attention was given to the horses. One of them was standing erect, with one foot lifted a little way from the earth, and the other was kneeling with his nose in the earth, and both were stone dead, and retained their positions until they were pushed over. The supposition is that in this case the electricity went from the earth to the sky.

THE Berlin correspondent of the London Times states that General Berdan, of the United States, has invented an instrument which will greatly improve the art of killing. He calls his invention a "range-finder." It consists of a telescope and other instruments, all of which can be carried on a dogcart, and which enable the engineers to measure with perfect accuracy up to 2,000 metres, or 1,500 yards. The time needed to ascertain distances, is only two minutes, and the General believes that his invention will double the accuracy of artillery fire, and quadruple that of infantry.