

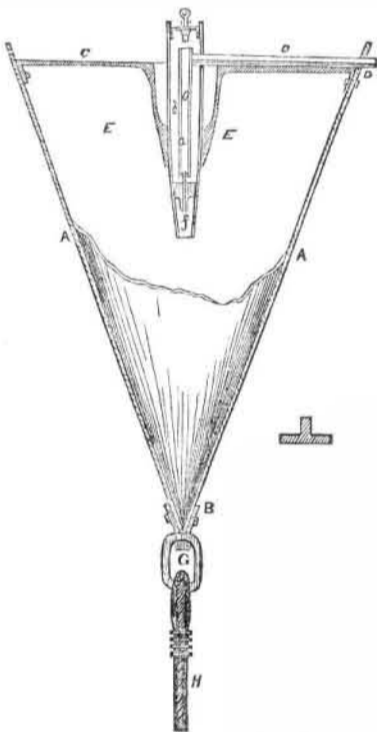
Science and Art.

Russian Infernal Machine.

In No. 46 of the last volume, we published an engraving of one of the Russian infernal machines, which have caused so much trouble to the vessels of the Allied English and French fleets in and about the harbors of Cronstadt. We now present additional diagrams, showing more completely the internal arrangement and construction of these much dreaded apparatuses. We copy from the London *Mechanics Magazine*.

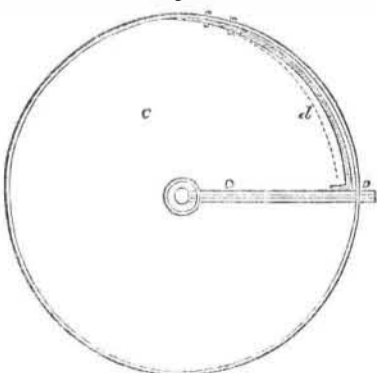
The Russian torpedo consists of an iron case, A A, in the form of a cone, on the apex of which, at B, is fitted a swivel, to which is affixed the mooring rope, H, adjusted to such a length as to hold the machine at the required depth below the surface of the water. On the base, C, fig. 2, is fitted a movable or sliding bar, D D, sustained in its outward position by the spring, d d, which bar projects, as shown, slightly beyond the base of the cone. In the center of the base of the cone is fitted the arrangement shown partly in section in fig. 1, which consists of a strong hollow plug of nine inches in length and nearly two inches in diameter, but tapering to one inch at its lower end. In the interior of this hollow plug is fitted the hollow tube, a a, suspended by its center, b, which tube can oscillate, when the cap, e, is drawn upward, in the outer plug or tube, as shown. The *modus operandi* is as follows: the cone, or what we may call more correctly the "hydraulic shell," is charged with the explosive mixture in the whole of its interior, E E, and the tube, as shown in section, being fitted in its place, the torpedo has only to be sunk to

Fig. 1.



the requisite depth, and on a vessel coming in contact, the cone being free to revolve, it will turn on its axis, G, until the projecting point or end of the sliding bar, D D (a section of which is given in fig. 3.) is pressed inward, when the tension of the spring, d d, being overcome, it assumes the position shown by the dotted lines, and pressing against the inner

Fig. 2.



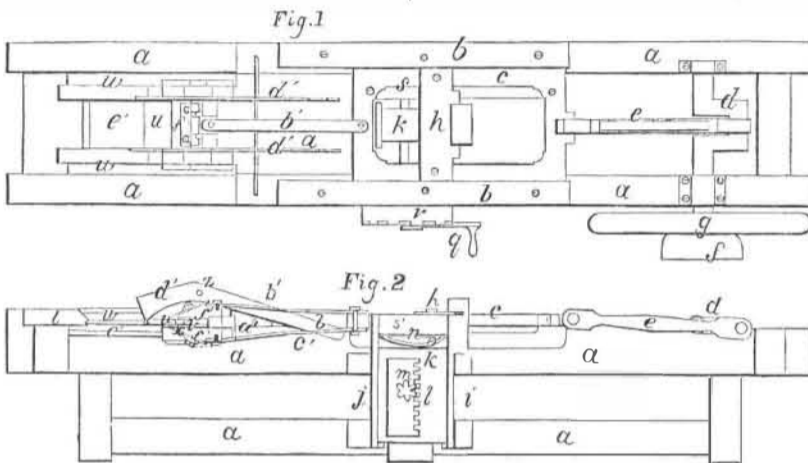
tube, a a, causes it to move out of the vertical position in which it is shown, and at the same time break the fine glass tube, f, which contains the chemical fluid for causing the explosion.

LEAVITT'S PATENT SHINGLE MACHINE.

The accompanying figures represent the improved shingle machine of Charles Leavitt, of Quincy, Illinois, for which a patent was granted on the 27th of March last.

Fig. 1 is a top view of the machine, and fig. 2 is a longitudinal section through the center. The same letters indicate similar parts.

The nature of the invention consists, first, in combining and arranging the various parts of a shingle machine so as to enable the bolt to be split in equal parts each time after the first cut, at the same time removing the sap. Secondly, in an elastic holder which retains the shingle in position while being planed or shaved to the proper taper. Thirdly, in the use and op-



er depressed by means of the internal rack, l, operated by the pinion, m, a cap piece, n, forms the upper portion of the table, k, upon which the shingle bolt is placed. Between this cap and the lower portion is a spring, o, which renders the table elastic, and allows it to give half the thickness of the knife, or more if required, when the bolt splits irregularly. The shaft, which carries the pinion, m, has on one of its extremities outside of the frame, a spring crank handle, q, which rests in one of the notches in the circular flange, r, which is fixed on the outside of the frame concentric with the shaft, p. The notches are nine in number, the handle, q, being placed in the first marked o, brings the table close up to the level of the knife, h, and when in any of the others the numbers thereon from 1 to 8 indicate that it is depressed the thickness of that number of shingles. Another froe or knife, S, is attached to the gate parallel to the side thereof which occupies vertically a space equal to a little more than that between the underside of the froe, h, and the top of the table, k, when brought down to its lowest point. Its vertical edge comes up close to the underside of the knife, h, and a little back of its edge. Its object is to take off the sap wood from that portion of the bolt split off by the froe, h. At the opposite end of the frame to that where the crank shaft is placed, is the apparatus by which the shingles are planed or shaved to the proper taper upon both sides at once, and jointed at the same time. For this purpose two plane stocks, f, are used, of any convenient construction, one for the top of the shingle, the other in a reversed position for the underside. They traverse in guides which converge to the end of their stroke. Also upon the upper plane stock two jointing knives, d', one on each side, the prolonged tail pieces of which form levers having their fulcra at the pivots, Z. These levers overbalancing the forward portions rest upon a bar, a', extending across the frame. When the plane stock is forced forward, the levers are necessarily elevated by the bar, a', and the cutting edges of the knives describe arcs, which produce drawing cuts on the edges of the shingle, e', which form smooth jointed edges parallel with each other. The shingle holder consists of a wooden tail block, and two pieces u and v, placed horizontally between the guides, w v being fixed in mortises, and u in slots which admit of horizontal motion. Between these two pieces is a spring, x, operating to keep u and v apart, but yielding to inequalities in the length of the shingles, or when the ends are not square, the ends of the piece, u, and tail block, are made with V-shaped grooves in which the ends of the shingles to be planed and jointed are placed. The plane stocks are attached to the gate, c, by the connecting rods, b' and c', and receive the motion therefrom.

eration of the jointing knives, which finish the edges of the shingles with a drawing cut.

The frame, a, is made with suitable cross piece, and supports, in a strong and substantial manner; upon its top, near the center, are two horizontal rabated guides, b, in which slides a sash or gate, c, with corresponding rabates.—The gate, c, is connected with the crank shaft, d, by the connecting rod, e, and derives a reciprocating motion therefrom by means of power applied to the pulley, f, attached to the fly wheel, g. Upon the upper side of the gate, c, is a froe, or splitting knife, h, which extends across the gate. Between the vertical guides, i and j, is a table, k, capable of being elevated

In operation the handle, q, is placed in a notch of r, so as to lower the table, k, to its lowest point, and the bolt is then placed on the table, and the machine put in motion. A piece sufficient to make eight shingles is then split off the bolt by the froe, h, and the sap stripped off by froe s. The handle, q, is then set in a notch so as to divide the piece into equal parts; then these are halved, and subdivided thus until the whole eight shingles are cut out. This method of splitting the shingles differs from that of those machines which split off shingle after shingle—one at a time—regularly from bolts; it embraces the principle of making shingles by hand, which experience has found to produce superior shingles, because wood bolts will not split so straight and regular except by equally subdividing them to take out the requisite number of shingles in each. This machine does the work with greater accuracy than by hand, and with far greater rapidity. The shingle holder is very simple and convenient, and its elastic spring enables it to hold the shingles firmly, though they may vary in length, or be of an irregular form.—The drawing cut of the jointing knives prevents the knife from splitting off the edge of the shingle, and thus produces a smooth edge and a beautiful shingle.

More information may be obtained by letter addressed to Mr. Leavitt, at Quincy, Ill.

The Telegraph Submarine Cable.

The loss of this cable, as noticed in our last number, has been confirmed, and the cause of the disaster made public by those who went on the excursion from this city in the steamer *James Adger*. A severe storm came on when the cable was being run off from the vessel which contained it, and when forty miles out, the said cable had to be cut, in order to prevent the vessel foundering. Forty miles of it have been sunk in the sea, and the remaining thirty miles saved. As one end of this cable was secured to the shore at Newfoundland, it is to be hoped that its severed end will yet be fished up, and united to the other section at some future day. This we believe the Company intends to do. At present the accident is a most unfortunate one, and we regret it sincerely.

Worcester Mechanics Association.

The mechanics of Worcester, Mass., laid the foundation stone of their new hall on the 3rd inst., and celebrated the occasion in a noble and praiseworthy manner, by a procession, various exercises, and an able address by the President, Henry S. Washburn, and afterwards by a dinner. The mechanics of Worcester are celebrated for their skill, industry, and intelligence. Long may their association flourish, and bring forth good fruits. There should be a

Mechanics' Association in every city and village in our land. Such institutions tend to cultivate the better qualities of the mind, and increase knowledge.

Decease of Judge Cranch.

The venerable Judge Cranch, of the District of Columbia, died at his residence in Washington, on the 1st inst. He was the Judge to whom appeals were made by inventors for many years, and his decisions were always characterized by a solid understanding of the subject, and a profound regard for justice to all parties. A number of his decisions are to be found in the reports of the Commissioners of Patents.

Literary Notices.

THE LONDON QUARTERLY REVIEW.—The last number of this Review, published by Leonard Scott & Co., 64 Gold street, this city, contains an article on the circulation of the blood, in which due credit is given to Harvey, for his discovery: modern physiology may be dated from Harvey's discovery. An article on the "Supply of Paper," contains much useful information respecting its history and manufacture. The other articles, as usual, are good. This is the first number of a new volume, and is an excellent time to subscribe.

REPUBLICAN QUARTERLY REVIEW.—This is the title of a new Review published in this city, by James M. Law, Wall street. It is professedly independent in everything, and open to free discussion. This is rather a new feature in critical literature, and a most difficult one to manage. This number contains some very good articles.

THE EDINBURGH REVIEW.—The number for this quarter of the above-named periodical, published by Leonard Scott & Co., 54 Gold street, contains ten original articles of profound literary excellence. One on "Modern Fortification" is a able and scientific and worthy the attention of all military men. This Review always maintains a fair and candid tone in discussing every question.



OF THE SCIENTIFIC AMERICAN.

ELEVENTH YEAR!

Splend d Engravings and Cash Prizes!

The Proprietors of the SCIENTIFIC AMERICAN respectfully give notice, that the ELEVENTH VOLUME of this well known and widely circulated Journal, will commence on the 16th of September next.

This work differs materially from other publications, being an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

The SCIENTIFIC AMERICAN is printed once a week, in convenient Quarto Form for binding, each volume being accompanied with a HANDSOME FRONTISPIECE, with a complete INDEX OF CONTENTS, and presents an elegant typographical appearance. Every number contains Eight Large Pages, of reading, abundantly illustrated with ORIGINAL ENGRAVINGS,—all the cuts inserted being engraved expressly for this publication. All the most valuable patented discoveries are delineated and described in its issues, so that, as respects inventions, it may be justly regarded as an ILLUSTRATED REPERTORY, where the inventor may learn what has been done before him in the same field which he is exploring, and where he may bring to the world a knowledge of his own achievements.

REPORTS OF U. S. PATENTS granted are also published every week, including Official Copies of all the PATENT CLAIMS. These Claims are published in the SCIENTIFIC AMERICAN in advance of all other papers.

The Contributors to the Scientific American are among the most eminent scientific and practical men of the times. The Editorial Department is universally acknowledged to be conducted with great ability, and to be distinguished, not only for the excellence and truthfulness of its discussions, but for the fearlessness with which error is combated and false theories are exploded.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and People in every profession of life, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the experience of which is beyond pecuniary estimate. Much might be added in this Prospectus, to prove that the SCIENTIFIC AMERICAN is a publication which every Inventor, Mechanic, Artisan, and Engineer in the United States should patronize; but the publication is so thoroughly known throughout the country, that we refrain occupying space to enumerate the reasons why we should have one hundred thousand subscribers instead of twenty-five thousand,—which is now our circulation,—and leave the matter in the hands of each of our present subscribers to recommend its worth to a neighbor or friend, who may have been so unfortunate as not to have been a subscriber heretofore.

TERMS! TERMS!! TERMS!!!

One Copy for One Year,	\$2
One Copy for Six Months,	\$1
Five Copies for Six Months,	\$4
Ten Copies for Six Months,	\$8
Ten Copies for Twelve Months,	\$15
Fifteen Copies for Twelve Months,	\$22
Twenty Copies for Twelve Months,	\$28

For Southern, Western, and Canada Money taken at par for subscriptions, or Post Office Stamps taken at their par value. Letters should be directed (invariably post paid) to

MUNN & CO.,
128 Fulton street, New York

For List of Prizes see Editorial page.