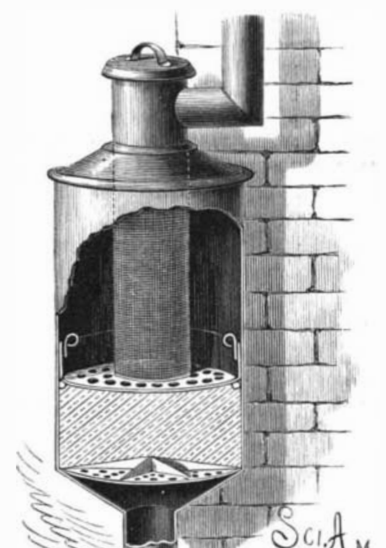
AN IMPROVED FOLDING IRONING TABLE.

An ironing table which stands firm in position, which can be set up with one locking motion, and can be moved from place to place without collapsing, is represented in the accompanying illustration, the small figure giving a side view of the table as it appears when folded. On the under side of the broad end of the table is a block, to which is hinged a diagonal bracing rod, whose lower end is made of a bifurcated casting form-

BURCAW'S IRONING TABLE.

ing feet, a bracing strip being pivotally connected to its upper face, which strip is held in supporting position upon the under side of the table or leaf by a rod, pin, and stop block. The main legs of the table are formed of a casting having upon its upper end forwardly extending lugs connected to brackets, so that when the legs are extended the lugs abut against the rear side of the block to which the diagonal bracing rod is hinged. When the table is open for use the several parts assume the position shown, all the movable parts abutting



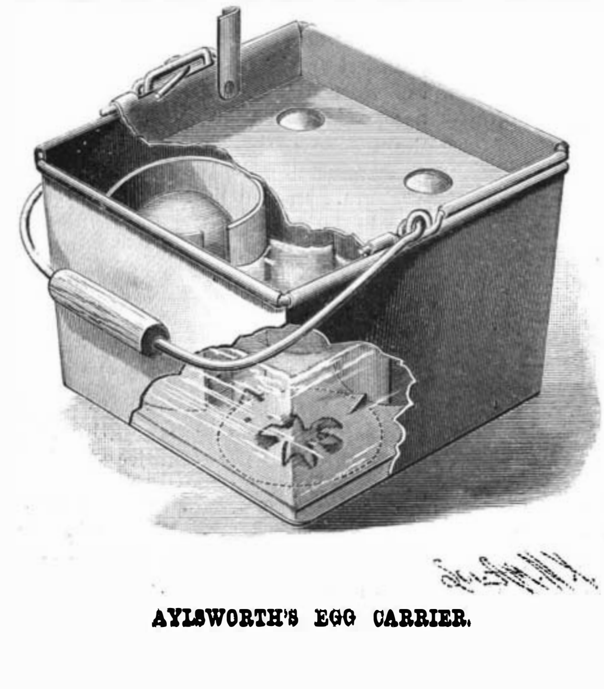
NESBET'S FILTER.

against some fixed stop, so there will be little or no side play, and the table will be very steady.

For further particulars address the patentee, Mr. Franklin P. Burcaw, box 226, Hazleton, Pa.

AN IMPROVED EGG CARRIER.

The invention herewith illustrated, recently patented by Mr. Harry E. Aylsworth, of Ashland, Kansas, is designed to provide a carrier in which eggs of various sizes may be held in spring supports, in which the eggs will be partly open to inspection without re-



AYLSWORTH'S EGG CARRIER.

moving the cover, and may be refrigerated in transit and during storage. The case consists of a slightly flared rectangular box of tin or other sheet metal, a wire around its upper edge so bent as to form bail loops. The cover is inset, its upwardly turned edges also inclosing a wire adapted to engage with the bail loops on the case. The cover and bottom of the case have apertures opposite each other, in the line of the positions occupied by the eggs, permitting inspection, and through which cool water may be poured to flow downward over the eggs. Plates adapted to fit within the case have apertures corresponding with those in the cover and bottom, and from these apertures extend radial slits, forming a series of tongues, bent alternately in opposite directions to form springs or cushions for the eggs, these plates resting upon the bottom and between the tiers of eggs. The egg-holding cells are formed of sheets of metal, bent to accommodate themselves to the size of the eggs, on which they exert but a slight pressure, these cells being easily attachable to the bottom plate or that placed on any succeeding tier of eggs. These carriers, when not in use, may be packed in small space for storage or shipment.

A ROLLER TOBOGGAN SLIDE.

A novel construction of toboggan slide, especially adapted for summer use at seaside and other popular resorts, is shown in the accompanying illustration, and forms the subject of a patent recently issued to Mr. George C. Peeling, of Lock Haven, Pa. Upon a suitable framework support are arranged side bars, which carry alternate slats and rollers, the side bars forming, in connection with the frame, an inclined way, in which the toboggans move downward. The manner in which the slats are made to alternate in the flooring of the slide is shown in the small figure; but where the inclined section of the slide joins the horizontal section at the foot of the incline, the rollers are placed more closely together, to prevent the toboggan from striking against the slats at this point. The bearings of the rollers are preferably of metal, and lubricating holes are provided for their journals. At a point near the top of the incline there is a sliding stop, connected to a lever pivoted to the framework, and by an operating cord leading therefrom to the top of the slide the attendant is able to readily release the toboggan at will, it having previously been held back by the stop until ready to start.

AN IMPROVED FILTER.

The invention herewith illustrated is designed more especially to furnish a filter for rain water, by which the water delivered from the roof is strained and filtered before entering the cistern. The main features of its construction will be readily understood from the illustration, the water first passing through an inner perforated sheet metal or wire cloth cylinder, to prevent the passage of coarse particles to the filtering material, which rests upon a ridged and perforated bottom. Upon the top of the filtering material is a perforated pan, which rests upon a shoulder on the inner walls of the outer inclosing cylinder, and has upwardly projecting sides, with handles, by which the pan may be easily removed. This strainer and filter presents an extended straining surface, and is so arranged that when any of the parts are fouled, they can be readily cleansed.

The above invention has been patented by Mr. William T. Nesbet, and for further particulars address Mr. D. Postlewait, Schell City, Missouri.

A RECORDING COMPASS AND MARINE INDICATOR.

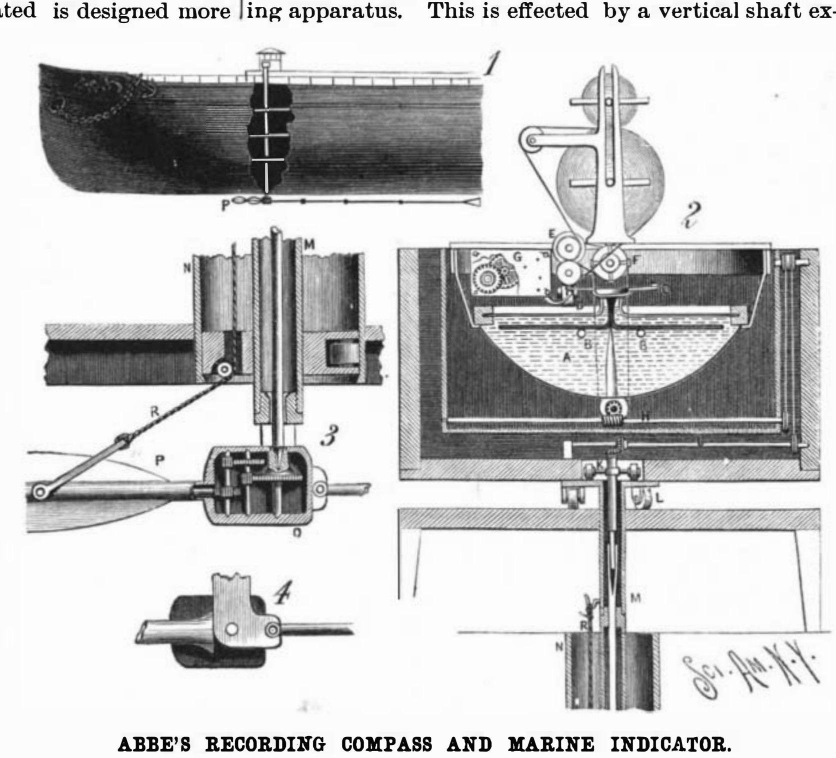
An invention to provide means for automatically indicating the speed of a vessel, the leeway it makes, and the direction of sailing, and keep a complete record thereof, is illustrated in the accompanying engraving, and forms the subject of a patent recently issued to Mr. Richard W. F. Abbe, of No. 70 East Seventh Street, New York City. Fig. 1 shows the device applied to a vessel. Fig. 2 is a sectional view of the indicator, which is designed to occupy a space only about 20 inches square, and to be placed in the cabin or navigation room of the vessel. Figs. 3 and 4 show the driving mechanism.

In constructing the indicator, a cup-shaped vessel, A, is suspended upon hangers, by its rim, from a ring pivoted at right angles to such supports, within a box, the latter being also hung upon pivots placed at diametrically opposite points within an outer box. The cup-shaped vessel has a top plate with upwardly projecting neck, and is filled with glycerine or a like liquid almost to the top of the neck. A compass card, carrying on its lower surface a U-shaped magnet, B B, is pivotally mounted within the glycerine, and from the center of the card a stem projects upward through the neck of the top plate, this stem carrying a circular plate, from which a series of type levers, C, project radially. There are as many type levers as there are points of the compass, and they are marked with letters

PEELING'S TOBOGGAN SLIDE.

corresponding with those on the compass card above which they are located. A clockwork, G, is arranged to cause these type levers to print upon a strip of paper unwound from a coil above, the strip passing through continuously, with a speed corresponding to the speed of the vessel, and being rewound in another coil, thus furnishing a printed record, the clockwork being set to print successive impressions at regular intervals, say every minute, every two minutes, or every five minutes, as desired. The compass card, turning freely on its pivot, as the direction of the vessel changes, will bring the different type levers in position to be operated by the hammer of the clock mechanism—the same character printed successively for a number of times showing that the vessel's course has not been changed.

The speed of the vessel is marked by the rate at which the strip of paper is passed through the recording apparatus. This is effected by a vertical shaft ex-



ABBE'S RECORDING COMPASS AND MARINE INDICATOR.

tending from below the keel up to the indicator, motion being given to this shaft by a screw, P, suspended in horizontal position just below and in line with the keel, and with which is connected, as shown in Fig. 4, a jointed vane rod about thirty feet long, the screw revolving with greater or less rapidity as the speed of the vessel increases or diminishes. This vertical shaft is carried in an inner tube, M, with necks in which the shaft may freely revolve, and by means of beveled gears, the shafts, J and H, and the cone pulleys, E and F, causes the paper strip to pass through the recording apparatus at a speed corresponding with that at which the screw revolves. In an outer tube, N, surrounding the shaft-carrying tube, M, passes down a rope or chain, R, made fast to a hook at its upper end, and its lower end carrying a pivoted hanger to which is attached the propeller frame. When the indicator is not to be used, or when the vessel stops, the box containing the apparatus is removed from the top of the tube, the chain, R, is disengaged from its hook, to permit the propeller to swing down, the vane rod also swinging down as the vessel stops, and all the parts on the lower end of the tube, M, carrying the operating shaft, can be drawn up through the outer tube, N.

When a vessel is making leeway, this fact is shown by the turning of the box carrying the indicator on its wheels, L. The effect of a current carrying a vessel out of its course will be to swing the vane rod proportionately across the line of the ship's keel, and this turns to a like extent the tube, M, whereby the box carrying the indicator is turned on its table.

As the impressions on the paper strip will be at a greater distance apart when the ship sails rapidly, the speed made at all parts of its course will thus be indicated by the printed record, the characters made by each printing also showing the direction sailed, as indicated by the compass, at all times during the voyage.

OUR NEW NAVY.

[*See illustration on first page.*]

A visitor to the Atlanta at the Brooklyn Navy Yard is immediately struck by the appearance of the ship, even before going on board, she is so totally different in appearance from anything we have hitherto been accustomed to. We find nothing of the graceful sweeping lines, tall, raking masts, and maze of rigging so inseparably associated in our minds with former ships of war. Everything here is hard, severe, straight, nothing of the jaunty or graceful—a practical utility visible everywhere.

The broad open decks of the frigate of '61, with its rows of big black guns glistening in the sunlight, give place to a few of the modern high power, small bored naval rifles. Their breeches set low to the deck, and to the old artillerist have a most bewildering lot of wheels, cogs, tracks, and scientific inventions, all covered in by a heavy bullet-proof shield, looking much like a huge inverted coal scoop, from out which extends the gun barrel, long, slender, tapering.

The great perfection and finish to which these guns have been brought is better realized as soon as the breech of one is opened. The interior shines like burnished silver, and the grooves, threads, and rifling are as clean cut and perfect as the mechanism of a watch.

Not the least curious part of these rifles is the new system of firing. The old fashioned style of ramming a long priming wire into the vent hole to pierce the cartridge case before firing, which necesitated appreciable time and care, especially in battle, has given place to a new invention by which a curious piece of mechanism, a veritable breech loading firing lock, is screwed on to the breech closer, in which a bullet-loaded cartridge is fired into the main charge. The bullet from this discharge traverses a fine smooth bore cut through the main breech closer, piercing the main cartridge and instantly opening up a passage for the flame to follow and ignite the charge, as shown in the cut.

The marines of the Atlanta are armed with the Springfield rifle, while the crew have the Lee modified magazine gun, which can also be used as a single shot. These new arms require the men to carry much more ammunition than formerly, and the old fashioned cartridge boxes are replaced by broad belts carrying 80 rounds, the whole supported by suspenders over the shoulders.

Our picture shows a squad of naval apprentices thus equipped as a landing party going through the skirmish drill of loading and firing.

Depth of the Charleston Earthquake.

In a communication to the American Academy of Sciences, Captain C. E. Dutton gives a calculation of the depth of the Charleston earthquake centrum, which puts it at the enormous distance of twelve miles below the earth's surface. The calculation by Robert Mallet of the depth at which the Neapolitan earthquake of 1857 originated was the first attempt to solve such a problem. Working on the assumption that the earth wave radiates in straight lines from the origin, and hence at different distances from the center of surface disturbance it has different angles of emergence, Mallet found that lines drawn parallel to these angles, if projected, would intersect each other at a mean depth of about five miles under the surface. From seismometric and other indications, the mean depth of the Yokohama earthquake of 1880 was calculated to have been about three and a quarter miles. While much greater depths of centrum have been assigned to some earthquakes, the accuracy of the calculations has been doubtful. Captain Dutton's new method of determining the depth of the focal cavity at Charleston gives, therefore, a most remarkable result. But his conclusion is in harmony with the observation of Mallet, that "earthquakes which have a very great area of sensible disturbance have also a very deep seismal focus."

The polar position of the sun has not yet been exactly located. Its approximate polar point among the stars may be assigned, but is of no value in astronomical work, and is not mentioned in books.

Brass Workers' Disease.

Very little attention has been paid in this country to a certain class of disorders observed among brass workers. The best known class of symptoms is that constituting what is called "brass workers' ague." After being exposed to the fumes of the molten metals, copper and zinc, the workman feels a sensation of discomfort and weakness, followed by muscular pains and then by a distinct chill, with headache, and often cough. After fifteen or twenty minutes a profuse perspiration breaks out; then in a few hours the improvement begins. The patient recovers in one or two days, but is liable to a relapse. Brass founders' ague was first observed by Blaudet in 1845. It was described by Greenhow, of Birmingham, in 1858, and again by Hirt. Brass is an alloy of copper and zinc, the latter being in the proportion of 28 to 32 per cent. In the process of making, the zinc deflagrates and fills the air with the powdered oxide. Dr. Greenhow believed, therefore, that brass workers' ague was an acute poisoning with zinc. Hirt, however, thought it due to the mingled fumes of copper and zinc, because it is not observed among zinc smelters. Recently Mr. Edgar Hogben (*Birmingham Medical Review*) reports a number of observations, and states his belief that brass workers' disease is due to chronic or acute copper poisoning. Almost all the patients who are copper or brass workers have a distinct green hue or band on the neck of the teeth between the crown and the gum. The edge of the gum is slightly blackened. The copious perspirations of brass workers are often stained green, and white-haired workmen often have a greenish tinge to their locks.

These signs point to an absorption of copper by the workmen, and favor the view that the "ague" is due, in large part at least, to this metal.

But these workmen also suffer from other symptoms of a chronic character, such as dyspepsia, metallic taste, colic, constipation and diarrhœa, nervousness, and pains of various kinds are felt. Deafness is not infrequent; cough and aphonia often occur. Paresis of the legs and symptoms like those of locomotor ataxia have been observed, and it seems probable that the copper can cause myelitis and neuritis, in the same way as does lead and other toxic agents.—*Medical Record.*

A Man Killed by a Swordfish.

In the last *Bulletin* of the U. S. Fish Commission received at this office, W. A. Wilcox, in a letter to Prof. Baird, relates a curious accident that befell Captain Langsford, as follows:

The schooner Venus is a small vessel of about 12 tons, owned and commanded by Franklin D. Langsford, of Lanesville, Mass., with a crew of three men, engaged in the general fisheries off the coast of Massachusetts. On Monday morning, August 9, 1886, Captain Langsford sailed from home in pursuit of swordfish. About 11 A. M., when 8 miles northeast from Halibut Point, in Ipswich Bay, a fish was seen. The captain, with one man, taking a dory, gave chase, and soon harpooned the fish, throwing over a buoy with a line attached to the harpoon, after which the fish was left and they returned to the vessel for dinner. About an hour later the captain, with one man, again took his dory and went out to secure the fish. Picking up the buoy, Captain Langsford took hold of the line, pulling his boat toward the swordfish, which was quite large and not badly wounded. The line was taut as the boat slowly neared the fish, which the captain intended to lance and thus kill it. When near the fish, but too far away to reach it with the lance, it quickly turned and rushed at and under the boat, thrusting its sword up through the bottom of the boat 23 inches. As the fish turned and rushed toward the boat the line was suddenly slacked, causing the captain to fall over on his back; and while he was in the act of rising, the sword came piercing through the boat and into his body. At this time another swordfish was in sight near by, and the captain, excited and anxious to secure both, raised himself up, not knowing that he was wounded. Seeing the sword, he seized it, exclaiming, "We've got *him*, any way!" He lay in the bottom of the dory, holding fast to the sword, until his vessel came alongside, while the fish, being under the boat, could not be reached. Soon the captain said, "I think I am hurt, and quite badly." When the vessel arrived he went on board, took a few steps, and fell, never rising again. The boat and fish were soon hoisted on board, when the sword was chopped off to free the boat, and the fish was killed on the deck of the vessel. The fish weighed 245 pounds after its head and tail were cut off and the viscera removed. When alive it weighed something over 300 pounds. Captain Langsford survived the injury about three days, dying on Thursday, August 12, of peritonitis. The certificate of Dr. Garland, written on the 16th of August, is appended, giving some further particulars, and the sword has been deposited in the U. S. National Museum.

CERTIFICATE OF DR. JOSEPH GARLAND.

This may certify that I was called to visit Franklin D. Langsford, of Lanesville, in Gloucester, on August 12, in consultation with Dr. Levi Saunders, who was in attendance upon the said Langsford, on account of a wound inflicted upon his body by a swordfish on 9th instant, said swordfish having driven its sword through the bottom of the fishing dory he was in to the length of 23 inches, penetrating the body of Langsford at the right of the os coccyx and entering about 7 inches, by the side of the rectum, into the pelvic cavity; that said Langsford was dying, and did die, in my presence, of peritonitis, having survived the injury about three days; that the sword accompanying this certificate is the veritable sword that occasioned the accident, and is to be sent to the National Museum at Washington.

Gloucester, Mass., October 14, 1886.

The Sun's Heat.

At a Royal Institution lecture, Prof. Sir William Thomson expounded the latest dynamical theories regarding the "probable origin, total amount, and possible duration of the sun's heat." During the short 3,000 years or more of which man possesses historic records there was, the learned physicist showed, no trace of variation in solar energy; and there was no distinct evidence of it even, though the earth as a whole, from being nearer the sun, received in January six and one-half per cent. more heat than in July.

But in the millions of years which geology carried us back, it might safely be said there must have been great changes. How had the solar fires been maintained during those ages? The scientific answer to this question was the theory of Helmholtz that the sun was a vast globe gradually cooling, but as it cooled shrinking, and that the shrinkage—which was the effect of gravity upon its mass—kept up its temperature. The total of the sun's heat was equal to that which would be required to keep up 476,000 millions of millions horse power, or about 78,000 horse power for every square meter—a little more than a square yard; and yet the modern dynamical theory of heat shows that the sun's mass would require only to fall in or contract thirty-five meters per annum to keep up that tremendous energy. At this rate the solar radius in 2,000 years' time would be about one hundredth per cent less than at present.

A time would come when the temperature would fall, and it was thus inconceivable that the sun would continue to emit heat sufficient to sustain existing life on the globe for more than 10,000,000 years. Applying the same principles retrospectively, they could not suppose that the sun had existed more than 20,000,000 years, no matter what might have been its origin—whether it came into existence from the clash of worlds pre-existing or of diffused nebulous matter. There was a great clinging by geologists and biologists to vastly longer periods, but the physicist, treating it as a dynamic question with calculable elements, could come to no other conclusion materially different from what he had stated.

Sir William Thomson declined to discuss any chemical source of heat, which, whatever its effect when primeval elements first came into contact, was absolutely insignificant compared with the effects of gravity after globes like the sun and the earth had been formed. In all these speculations they were in the end driven to the ultimate elements of matter, to the question—when they thought what became of all the sun's heat—what is the luminiferous ether that fills space, and to that most wonderful form of force upon which Faraday spent so much of the thought of his later years—gravity.

Annual Convention of the American Society of Civil Engineers.

On July 1 the American Society of Civil Engineers began its nineteenth annual convention. The hotel Kaaterskill, in the Catskill Mountains, was selected as the place for the meeting. The different sessions were devoted to topics of civil and railroad engineering, the meeting being a combination of professional work with amusement. A large number of ladies accompanied the members and added to the last-named feature. A number of papers were devoted to the subject of the "Maintenance and Inspection of Railway Structures." All mooted points of bridge construction and the expediency of legislation and methods of inspection were touched upon. In the light of some recent casualties, this is at the present time a subject of much interest. A description of the old De Witt Clinton locomotive, under the title of "A Triple Thermic Motor," and papers on "The Behavior of Mortars under Various Conditions" and "Experiments in the Testing of Cements" followed. The Poughkeepsie bridge was also discussed, and was the objective point of an excursion on July 5. Sewage disposal, the forms of wheels and rails, and the compressive strength of iron and steel were among the large list of subjects treated.

A banquet was given on Thursday, July 7, and on Friday, July 8, the meeting dispersed. Whether by its numbers or professional eminence of those attending it, it was a very memorable meeting. Between three and four hundred members were in attendance.