

EGG AND POTATO TRICK.

For some reason or other jugglers have always been very fond of egg tricks, and in the repertoire of many of them, the egg takes an important position. Few laymen know that it is impossible to balance a raw egg. Jugglers use hard-boiled eggs, which are spun on their small ends on shallow japanned trays. If the tray is kept gently moving in a small circle in the opposite direction to that in which the egg is spinning, the latter will continue to spin as long as desired.

A fitting finale to any juggling act is to place a potato on the hand of an assistant and cut the potato in two with a sharp sword without leaving any mark upon the skin. A second potato is often cut on the neck of the assistant.

Among the several medium sized sound potatoes on a tray are placed two potatoes prepared as follows: Insert a needle crosswise of the potato near the bottom. After showing the sword to be really sharp, by cutting paper and slicing one or two of the potatoes, the performer picks up one of the prepared potatoes and places it on the assistant's hand; but apparently it does not lie to suit him, so he slices off one side of it, using care to cut away the side just under the needle and as close to it as possible, then places the potato once again on the assistant's hand. After making a few flourishes with the sword, he cuts through the potato, dividing it in half.

In striking the potato with the sword he makes sure that the sword will come exactly crosswise on the needle; consequently, when the sword reaches the needle it can go no farther, and the brittle nature of the potato will cause it to fall apart, the very thin portion below the needle offering no resistance to the separation. The second potato is then cut in the same manner on the assistant's neck. There are many other false juggling tricks, but the above will suffice to show that "there are tricks in all trades but yours."

STEEL WIRE GUNS.

It was along about 1850 that Mr. Woodbridge first presented an iron gun wound with steel wire to the American government. The object that the inventor had in view was to reinforce cannon and, consequently, permit of the use of higher internal pressures. But this first tentative was unsuccessful, since certain arrangements, such as the welding of the wires together and the tension given them, were followed by poor results.

Five years later Mr. Longridge experimented in England with a gun based upon the same principles, and which may be regarded as the first steel wire cannon. The same study was undertaken in France, between 1871 and 1880, by Capt. Schultz, and then abandoned.

At present everybody is in accord in recognizing the advantages of this mode of construction, as far as the resistance of the piece is concerned, and for the last few years England has not hesitated to render such system of artillery reglementary. Its entire new fleet is provided with it. It is even surprising that it delayed entering upon the manufacture of such guns so long. The reason was that it was claimed for a long time that steel wire cannon were wanting in longitudinal resistance. This sort of prejudice was due to the results furnished by the first guns of the kind, which were composed of a simple bronze tube wound with several layers of wire. Under such circumstances, the longitudinal resistance was feeble, and the guarantees of safety and duration were insufficient.

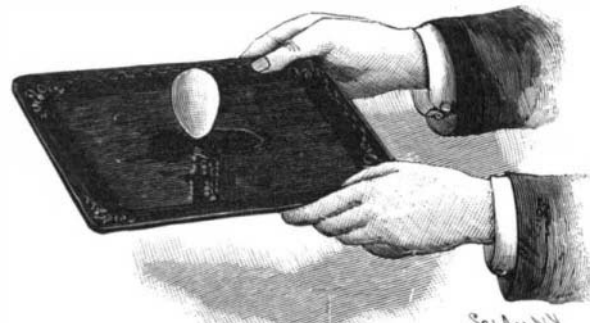
Subsequently, the use of a jacket carrying the breech block and trunnions has dispelled every doubt that this new artillery could give rise to.

Mr. Longridge, continually improving his processes of manufacture, has finally produced a powerful gun that is capable of withstanding in the chamber pressures that amount to nearly 5,000 kilogrammes to the square centimeter.

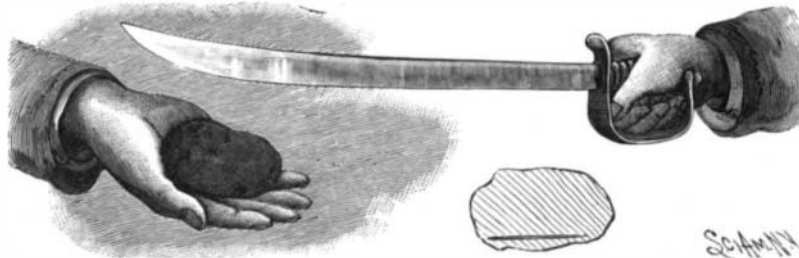
In No. 1 of the accompanying figure, from *La Nature*, is represented an English rapid-fire regulation piece of 152 mm. of the Longridge model. Its length is 6.3 meters—say about 41 calibers. It consists of a bored steel tube of 152 mm. diameter, upon the back part of which is shrunk a second steel tube, around which are wound several layers of steel ribbon 6 mm. wide and 1.5 mm. thick. The resistance of these ribbons to rupture is comprised between 140 and 150 kilogrammes per square millimeter of section. Their tension is regulated by special machines. Over the ribbons is fixed the jacket, designed, as we have stated, to assure longitudinal resistance.

In the construction of steel wire guns, England has

been followed by the United States. Mr. Brown, who is well known on the other side of the Atlantic through his remarkable work upon artillery, proposed to the war department of the United States a system of cannon in which the ordinary steel hoops were replaced by windings of wire. One of the peculiarities of this gun consists in the replacing of the second steel tube of the Longridge piece by a series of jointed segments that unite with each other upon a thin steel tube. This latter constitutes the chamber of the gun and is pro-



SPINNING AN EGG.



CUTTING A POTATO ON THE HAND.

vided with the grooves that give the projectile its rotary motion.

According to Mr. Brown, the advantages presented by this new gun reside especially in the use of materials, such as segments, wire, etc., of small dimensions, the material to be given the highest possible qualities of resistance, and ensures very perfect results.

The manufacture of the new piece is relatively simple. The longitudinal segments are assembled as shown in Figs. 2 and 3, and the two extremities of the tube thus formed receive a ring. The whole is then turned upon a lathe in such a way as to give it the proper dimensions, and form upon the external surface a series of steps of which the height is precisely equal to the thickness of the steel wire designed to form a hoop.

These wires have a square section of 3.5 mm. They are wound successively over each step and alternately in one direction and the other, the proper tension being given them by a special machine. After the winding is finished, the gun is heated, and there is introduced into the interior a thin steel rifled tube.

The jacket that carries the breech block and trunnions assures the longitudinal resistance, as in the English pieces. Such resistance is further increased

splitting of the internal tube, and after there had been developed in the chamber a pressure reaching 5,800 kilogrammes to the square centimeter.

The experiments have, therefore, fully decided in the inventor's favor. The only difficulty consists in the selection and arrangement of the internal tube, which, in the experiments, exhibited a slight weakness. This has not prevented the United States government from deciding upon the construction of a Brown gun of 250 millimeters caliber.

The length of the wire designed for the winding will be about 120 kilometers. Upon the English guns of 305 millimeter caliber, the length reaches 160 kilometers. Mr. Brown estimates that the initial velocity will be from 900 to 930 meters per second. If the experiment proves a success, the Americans will possess a gun that will be greatly superior to any of those now employed in the various European navies, and, with their habitual spirit of decision, they will doubtless make a transformation in their present armament, which leaves much to be desired.

The Waste of Shipping.

Lloyds Register keeps us informed as to the waste of shipping. There are many causes which lead to vessels being removed from the register. Most of them are painful to contemplate, since they involve danger to life, while one gives cause for satisfaction. A certain number of vessels are broken up or condemned, and it would be well if this number were greatly increased, since it would reduce the loss under other heads. It is not often that the well-found ship appears in these returns under the headings of "Abandoned at Sea," "Foundered," "Lost or missing." The experience of the Atlantic companies has shown that a ship can be rendered almost as safe as a house on shore by a liberal expenditure of money and by increasing vigilance on the part of the captain and crew. It is the ship on which undue economy is exercised that usually falls a prey to bad weather.

The period of July 1 to September 30, 1897, was not marked by any excessive amount of casualties. During that time 176 vessels, or 137,286 tons, were removed from the register in various ways. This compares favorably with the same period in 1896, when 211 vessels, or 162,724 tons, were removed. It is, however, slightly over the average for the past decade. There is improvement under every heading, as compared with the same quarter of last year, except under "Wrecked," and this increase seems to be due to the larger size of the vessels, and not to an augmented number of casualties.

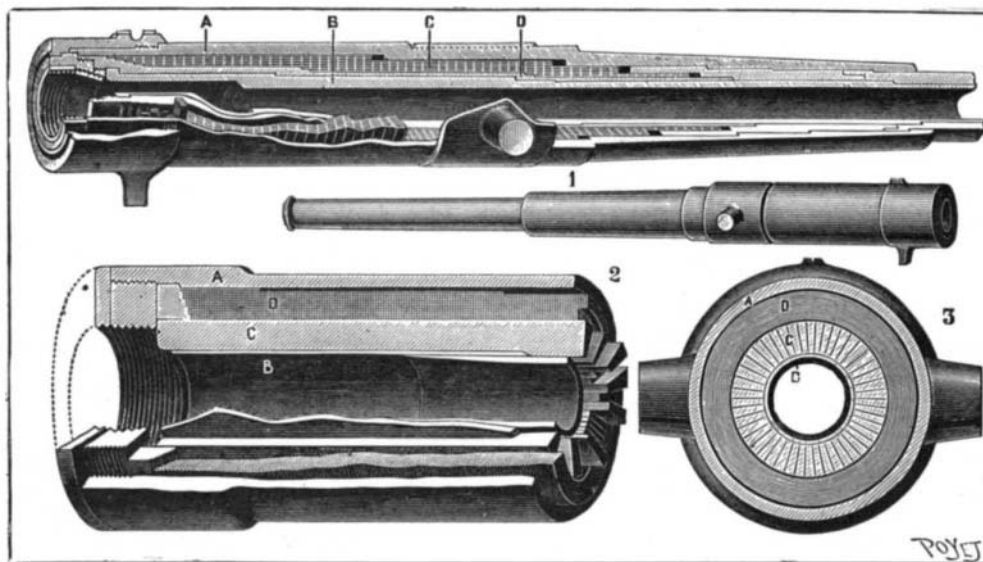
In the third quarter of 1896 there were 96 vessels, or 62,763 tons, wrecked, against 80 vessels, or 68,882 tons, in 1897.

Of vessels owned in the United Kingdom, there were 21 lost in this way in each quarter, but in 1896, 33,000 tons. There were 42 vessels, or 35,325 tons, broken up, condemned, etc., in the period under review, against 39 vessels, or 47,640 tons, last year. The vessels which foundered seemed to have been generally of small size, and only two, totaling 454 tons, were owned in the United Kingdom.

When we begin to discriminate between steam and sailing craft, we find that it is the former that accounts for the major portion of the tonnage lost, while the latter swells the number of vessels lost, the vessels being: Steam, 57 vessels, of 84,681 tons gross; sailing, 119 vessels, of 52,606 tons net. During the quarter there was not a single steamer posted as "Burned," "Lost," or "Missing," and only two were abandoned at sea. As against this, there were 11 sailing ships abandoned, six burned, one lost, and four missing. Of vessels owned in the United Kingdom, 0.044 per cent of steam were removed, and 0.057 per cent of sailing vessels, a fact that a timid voyager may well note. The disparity of these figures would be increased still further if vessels broken up were not included. If we were to judge by the tables, the safest ship to go to sea in

is a Swedish steamer, since only 0.018 per cent of the vessels under that flag were lost in the quarter. This high figure of safety is not always maintained, but, nevertheless, Swedish steam vessels have an excellent record. Their sailing craft do not do so well, but then many of them are engaged in the timber trade, and any leaky tub is considered good enough for that.

WHAT struck a Fiume, Austria, warehouse and set it on fire turns out to have been a meteor. It was assumed to have been lightning till a four-ton meteoric stone was found in a deep hole in the cellar.



1. English Regulation Gun of 152 Millimeters Caliber: A, jacket; B, internal tube; C, steel ribbons; D, second tube.
2 and 3. Sections of the Brown Gun: A, jacket; B, internal tube; C, segments; D, steel wires.

by the arrangement adopted for the winding of the wires.

Mr. Brown made his first experiments with a 25 mm. gun. As the results were favorable, he constructed upon the same principle a piece of 127 mm. caliber and 5,300 kg. weight. The tests of this, which were made under the supervision of the United States war department, were very remarkable, and the piece showed an unprecedented resistance.

A second gun of the same caliber, presented by the inventor, was experimented with in 1893 at Sandy Hook. It was put out of service after 216 shots by the