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Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 988.

For the Week Ending December 8, 1894.

Price 10 cents. For sale by all newsdealers.

A TORPEDO BOAT THAT RATES OVER THIRTY-THREE MILES PER HOUR.

The British Admiralty is adding a large fleet of fast torpedo boats to the navy, several of which, already completed, are faster than any boats in the world. The latest example is the Ardent. This boat is 200 feet long, 19 feet wide, 14 feet deep. Her engines are 5,000 horse power, built by Thornycroft & Co. On trial November 9, making two runs with and against tide, her mean speed was 29·18 knots per hour, or a little over 33½ miles per hour—the fastest velocity ever attained by a steam vessel. At the above speed there was an absence of the usual vibration and but little flame at the tops of the chimneys. The Ardent is a wonderful boat. We need not enlarge upon the importance to our own navy of the possession of vessels equal in speed to those of other nations, and it is to be hoped Congress will lose no time in providing for their construction.

THE NEW BROOKLYN BRIDGE STATIONS.

The work of enlarging the terminal stations of the Brooklyn Bridge is being rapidly advanced, and something of their ultimate design is already apparent. With the new system of tracks and platforms, trains may be run across the bridge every 45 seconds, instead of every 90 seconds, as at present. The present carrying capacity of the cars is 16,000 per hour, and this will be increased to 32,000 persons per hour. There will also be an entirely new arrangement of stairs and passage ways for reaching the street and the elevated railroad stations. The exacting requirements of the new stations and the limited amount of space available for carrying them out make the work very interesting from a mechanical standpoint.

The platforms in the new stations will be much wider than the present ones, and tracks will be laid on each side of them. The trains will be run to and fro on both sides of these platforms, thus making it possible to load and unload two trains at a time. At present the work on the station at the Brooklyn end of the bridge is much farther advanced than on the New York side. The framework of the building is in place and the work of putting on the roof is already well under way. The outward appearance of the station will be much the same as the old one, but the interior arrangements will be widely different. The Brooklyn station now extends from Sands Street to High Street, although it will ultimately extend on its north end as far as the north side of Sands Street. This part of the work, however, will be delayed until the Brooklyn elevated railroad has finished its connection with the bridge, and the present elevated railroad station has been removed. The new bridge station will not be used until both of the elevated roads are ready to bring passengers to its southern end. The Brooklyn elevated road intends to run through the northern end of the bridge station, then to encircle the plaza and pass again through the station at its southern end, thus forming a continuous loop and avoiding the trouble of switching. According to Superintendent Martin, it will not be possible to run bridge trains on the new system before next spring.

The roadways on the bridge have been widened near the stations on both sides of the river to prepare for the new arrangement. The purpose is to spread the railroad tracks wider apart than they are at present, so that the trains may be run to the outer edges of the new platform. The new tracks will therefore extend a trifle over the old roadway.

A serious objection to the new system will be the increased danger of accident incurred in handling so many trains. The new system is, however, the most perfect one possible under the present conditions. To obtain greater safety of transportation, relief can only be found by building other bridges.

THE SMALL CALIBER BULLET IN THE EAST.

In our issue of November 10 we published an article entitled "Small Caliber Projectiles." Since the appearance of this article the world has learned of the terrible wounds produced by the small bullet in the war between China and Japan. It has been known for a long time that the small caliber bullet would necessarily increase the death rate in war. In Germany the number of litter bearers has been largely increased, so that every corps now has 1,168 litter bearers; this increase was made in view of the fact that greater mortality might be expected. As far back as the battle of Gravelotte, in 1870, the superiority of the French chassepot of 11 mm. over the Prussian needle gun of 14 mm. was noted. From 1886 on experiments have been conducted to ascertain the efficiency of the new projectiles and the nature of the wounds produced by them. In the lecture delived to the cadets at Annapolis "On Gunshot Injuries Produced by the New Projectile of Small Caliber," by Henry G. Beyer, Surgeon U. S. N., printed in the Proceedings of the U. S Naval Institute, thirty-four references were made to literature on the subject, no title being earlier than 1881. The experiments were made on cadavers and animals, and showed that a great deal of the tissue was destroyed and the bones very finely comminuted. The destruction wrought by the new bullet is largely the result of the so called "explosive action." By this term we are to understand the injury produced by projectiles, which is out of proportion to the size of the projectile itself. Thus if the tissues are destroyed or pulped and the bone pulverized, the injury would be more extensive than if the bullet had merely plowed through the flesh and fractured the bone.

The captain of one of the American warships on the Asiatic station has written home of some very interesting things that he has seen. Describing a visit to the Japanese field hospital, near Nagasaki, he says:

"There I got a fair conception of the killing and wounding qualities of the new small bore rifle that all Europe is adopting. The Japanese infantry arm is the Murata, the invention of Gen. Murata, now chief of ordnance of Japan. The caliber of the gun is 0·315 and the bullet weighs 235 grains.

"I saw a Chinese officer who had been struck in the knee joint by one of these bullets, fired at a distance of about 1,000 yards. The thin steel envelope of the bullet had broken and the joint was simply a mass of finely comminuted bone splinters. The knee was perfectly soft, without a bone in it unbroken an inch long. Of course the leg had to be amputated."

The caliber of the new United States magazine rifle is 0·30 and the bullet weighs 220 grains. When this bullet was first decided upon, there was considerable talk about the new bullet lessening the mortality in war. Many persons claimed that the new projectile would, in a large number of cases, simply put the soldier hors de combat, and some even went so far as to call it a "humanitarian" bullet; but it is difficult to see wherein humanity is benefited, in view of the facts mentioned above, unless it is to assist in extirpating war, for after all a battle is a "bestial frenzy," as Leonardo da Vinci has well remarked.

A Model Tenement House.

Plans are being discussed by a number of philanthropic people in New York for providing healthful and comfortable tenement houses for the poor at reasonable rates of rent. It is proposed to build on a plot of ground in Brooklyn, 75 by 208 feet, a huge structure six stories high, to contain 408 rooms. Several of the provisions for the comfort of these people will doubtless prove of great value. A central open court, 20 feet wide, will run from the front to the rear of the building, thus providing plenty of light and air. No rooms are to communicate, but all will be easily accessible. The frame of the building is to be constructed of iron or steel, and the covering will consist of sheets of corrugated iron. The whole is to be absolutely fireproof. The building will also be supplied throughout with the most approved sanitary arrangements. The estimated cost of the building is $125,000. The rooms will be rented in suites of 2, 3 or 4, at the rate of $3 a month for each room. The stock company who expect to supply the capital for this undertaking argue that the tenement houses are a necessary evil, and that charity should be expended to the end of making them as wholesome as possible. A novel feature of this establishment will be the distinct divisions into which the house is to be divided, in order to provide separate apartments for Germans, Jews and Italians.

Steam as a Means of Defense.

A simple and effective method of repelling train robbers by discharging jets of steam upon the attacking party has recently been patented by William H. Reeve, an old tugboatman, of New York. The inventor has enlarged upon the plan long followed by railroad companies of attaching a steam jet to locomotives to scare cows and other animals from the track. The patent provides for running steam pipes along the boiler, one on either side from the cab forward. The ends of the pipes are supplied with small nozzles so formed that jets of steam may be projected through them a distance of 50 or 60 feet. It is claimed that these would prevent any person from approaching nearer than this distance. Similar pipes could be run to the rear of the train and be supplied with nozzles, rendering it impossible for any one to reach the rear platform. Other pipes could be arranged at the car doors, while by the use of flexible pipes or hose the steam could be carried and discharged from the windows at will. These pipes need not be so large as to be unsightly or inconvenient in any way.

A further use of steam as a means of defense, the inventor claims, would be in protecting banks against thieves. Since banks are usually heated with steam, the attachment could readily be made. Small jets of steam might be so arranged at the windows of the tellers that they could be projected into the faces of the robbers. These jets might be operated by hidden levers or by electrical attachments.

A more ambitious plan, however, is to utilize steam in the defense of forts, armories or arsenals. Powerful jets of steam could be discharged at doors and windows of arsenals. Forts could be protected in a similar manner, and as long as the supply of steam held out, the inventor claims, they could not possibly be carried by assault.