

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 261 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

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NEW YORK, SATURDAY, NOVEMBER 24, 1883.

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No. 412,

For the Week ending November 24, 1883.

Price 10 cents. For sale by all newsdealers.

Detailed table of contents for the supplement, including sections like 'I. CHEMISTRY AND METALLURGY', 'II. ENGINEERING AND MECHANICS', 'III. TECHNOLOGY', etc.

TRIAL OF THE HASKELL MULTICHARGE GUN.

This gun—described and illustrated in the SCIENTIFIC AMERICAN SUPPLEMENT of August 11, 1883—is now being tested by a board of army and navy officers at Sandy Hook. It is a breech-loader, weighs 25 tons, is 25 feet long, and has a bore 6 inches in diameter.

The principle upon which the gun works is, briefly, as follows: The shot, which may be two, three, or even four diameters in length, is banded with copper to take the rifling, there being fifteen grooves having one twist in 12 feet and a depth of six one-hundredths of an inch; and after it has been placed in the gun, disks of sole leather and copper, greased, are inserted behind it in order that the close fit thus insured may prevent the gas resulting from the first explosion from getting in front of the shot.

The aim of the gun is to deliver the shot from the muzzle with the same, or nearly the same, pressure behind it that it had at the start, and the following readings of pressures will show how nearly this was accomplished: breech, 20,200 pounds per square inch; first pocket, 19,000; second pocket, 20,200; third pocket, 19,000; fourth, 20,500.

Table showing pressure in pounds per square inch for different charges of powder (breech, 1st, 2nd, 3rd, 4th pockets) and velocity in feet per second at 100 feet.

In rounds No. 26, 27, and 29 the shots were four diameters, and the resulting pressures and velocities are remarkable. Considering the weights of powder and shot, the pressures and velocities are in advance of any yet obtained from a single charge 6-inch gun.

It will be of interest in this connection to note some of the best results obtained by English practice after long study regarding the size, form, hardness, and density of the powder, the dimensions of the powder chamber in the gun, and the space occupied by the charge, and the careful noting of the pressures exerted in different parts of the seat of the charge.

These results are better than those of former years in regard to diminution of pressure, its uniformity in different parts of the bore, and high velocity. Large cylindrical or prismatic powder of normal composition is used.

REPAIRING SUSPENSION BRIDGE CABLES.

The suspension bridge at Pittsburgh, Pa., was built some twenty-four years ago, and a recent examination of the cables near their moorings showed them to be much corroded, and consequently reduced in strength. The cables are 7 1/4 inches in diameter, and when placed in position their ends were covered with a preparation of boiled tar and then protected by concrete masonry.

When this state of affairs was ascertained, Mr. F. Colling-

wood, of the Brooklyn Bridge, was intrusted with the work of repair. Each cable was carefully overhauled and the tar scraped off. When a defective piece was found, it was cut out and a new piece spliced in. The splicing was a difficult and delicate job, for although it was easy to join the ends it required care and judgment to subject the new piece to the right strain, so that it would bear its portion of the load.

The work is very tedious, as only a few men can work at a time. After the repairs have been made the wires are covered with linseed oil, which is allowed to dry, when a thorough application of white lead is put on. The wires are then drawn together by bands of small wire 7 inches apart.

When building the bridge the moorings were so cased in masonry that they could not be examined. This added to the cost and labor of making the repairs. In case it should be necessary to repaint or repair the cables in the future, the masonry has been replaced by a water tight brick tunnel provided with iron water shedders, and covered with iron plates that can be lifted when admittance is desired.

Technical Education in the Carriage Trade.

At the recent convention of the Carriage Builders' National Association, by far the largest meeting ever held of members of this trade, the related subjects of apprentices and technical schools for boys received a large share of attention. The absence of any regular apprentice system in the trade was deprecated, but the idea of establishing and enlarging the field of possible usefulness of technical schools was generally approved.

1. Linear designing, including scale and full size drawing. 2. Geometry applied to carriage construction, including the principles of the "French Rule." 3. Carriage body making.

In order, however, to enlarge the sphere of usefulness of this technical school, the committee in charge have decided to adopt what has been known as the "Chautauqua" system, whereby classes may be organized in various parts of the country, and their instruction carried on by correspondence, according to a regular system.

James Marion Sims.

This distinguished physician and surgeon died very suddenly of heart disease at his home in this city on November 13. He was born in Lancaster district, South Carolina, January 25, 1813. He graduated from the South Carolina College at Columbia in 1832, and then studied medicine at Charleston, S. C., and at the Jefferson Medical College in Philadelphia, from which he graduated in 1835.

In a private hospital established by him in Montgomery, Ala., he began a course of experiments in regard to vesico-vaginal fistula, then regarded as incurable, which resulted successfully. He had introduced the use of sutures of silver wire instead of the silken and other sutures formerly in use, and he afterward extended the employment of metallic sutures to all departments of general surgery.

An atmosphere containing 14 per cent of carbolic acid has been found to be a guard against explosions of fire damp.