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THE NEW COMMISSIONER OF PATENTS.

The President has appointed Mr. Charles E. Mitchell, of Connecticut, to be Commissioner of Patents. Mr. Mitchell is a man of the highest ability, wide influence, exalted character, clear judgment, a successful and experienced patent lawyer, and prompt and vigorous in action.

WAR MATERIAL OF AMERICAN DESIGNING.

The world moves so fast and improvements follow one another in such rapid succession that the work of original designers is often lost amid a maze of modifications, and the imitator becomes famed above the artist. If we turn to modern war machinery, we shall find apt illustrations of this, and in most of the effective material in the great European armaments behold the cunning fashioning of the Yankee inventor.

The world talks of the Krupp gun, yet how few are aware of the fact that it was only through the invention of the American Col. Bradwell that Herr Krupp was enabled to make his guns effective? Gen. S. V. Benet, Chief of Ordnance, U. S. A., speaking on this subject, says:

"All modern steel guns are of one or two systems, either the Krupp bolt system or the interrupted screw used in the French service. Our guns are of the latter system, which seems to offer the greatest advantages. Like all good modern inventions, it is an American one. So, for that matter, is the Krupp, or rather what gave Krupp's invention the practical value. The great trouble with the Krupp gun was the escape of gas at the breech. This was overcome by the aid of the 'Bradwell plate,' the invention of Colonel Bradwell, an American who sold Krupp the invention. It consists of a thin steel plate, with elastic edges, that fits in the breech, and the pressure of the gas wedges it tightly against the sides and prevents the escape of gas."

The machine gun, that terrible weapon now so important a part of the great European armaments both on land and sea, is primarily an invention of the American, Dr. Gatling; the French mitrailleuse is a modification of it, so is the Nordenfelt. In June, 1883, Nordenfelt brought suit against Gardner, inventor of the Gardner machine gun, for infringement. Gardner showed that the principles on which the Nordenfelt gun was constructed had long been developed in the American Gatling machine gun and Winchester rifle, indeed long before 1873, when Nordenfelt got his English patent. It may fairly be said that this principle has found its highest development in the automatic gun of the American, Hiram Maxim, a gun which will fire 600 shots a minute; the recoil being utilized to load and fire and to keep a stream of water moving about the barrels for cooling. The disappearing gun mechanism is also his invention. The screw propeller, an invention that makes it possible to sink the motive power of a war ship, within and without, out of range of flying shot, though first tried in British waters, found no favor till Captain Ericsson came hither. The revolver, now in universal use, is, as everybody knows, the invention of Col. Colt, of Connecticut. We may add to the list the dynamite gun, yet in the infancy of its development, and the dynamite cruiser, intended to make up for its shortcomings in point of range, of which an English authority recently said there was not, probably, a ship afloat that would be safe before it. The torpedo, now holding so important a place among war material, was first made practicable and effective during our last war; its cousin, the automobile torpedo, of comparatively recent designing, is also American, though there are several foreign forms of the same.

WANTED—A FIRST CLASS GUN.

Now that we are building a new navy, and Congress, with the people at its back, ready to grant the money, there is more encouragement for inventors of war material than at any time since the civil war. In the matter of ships and guns alone there is a large and rich field for ingenuity. Admiral Porter and other reliable authorities say that among the great modern European fleets, of which we have heard so much, there is not one effective line-of-battle ship—an assertion which recent performances of these unwieldy monsters

* According to the patent, this should be Broadwell.

in sham battle seem to fairly sustain; and there are other authorities, and good ones too, who insist that the big guns of these same fleets are constructed on a false interpretation of the natural laws, and that, when they are put to a severe test, will fail.

"Gun tests in Europe," says a writer—an ordnance officer—"are private affairs. Guns fail without the fact becoming known outside of the small circle of officers assigned to be present at the butts. Who can say how many of these failures there are?"

For long it has been known that there was something amiss at the great gun works at Terre-Noire, and recently the cause has appeared. The French, who long since adopted the American (Rodman) system, began at these works to construct guns on the built-up plan, but there were so many failures—the test being only forty rounds—that the project was given up. And of this Rodman system some of the best authorities say it has no equal, and may be applied to cast steel as well as to iron. By it guns are cast hollow and then cooled down from the interior, so that the interior, being first solidified, is compressed and supported by the contraction of the outer parts when they subsequently cool down. A gun thus made being fired, the compressed inner portions expand under the influence of the powder gas to and beyond their natural diameter, the strain going at once to the outer parts. By this system, it is said, a 200 ton gun may be made just as securely and surely as one of the old 15 in. or 20 in. smooth bore guns.

Mild cast steel is thought by many to offer superior advantages for great-gun making, being stronger and more homogeneous than wrought iron. It is stronger, too, than cast iron, though not more homogeneous. Mr. William Metcalf, for many years connected with the old Fort Pitt foundry, and now engaged in making steel, speaking of the application of this famous system of casting to steel, says:

"If ordnance constructors could only be made to understand that cast steel is only cast iron refined and strengthened; that every rule, every property, every characteristic, of one is common to the other, only differing in degree; if they would realize that Rodman reached the perfection of science in manipulating crystalline metal, American guns of cheap cost and sure value would soon be as far ahead of the composite failures of Europe as the great cast iron Columbiads of our war days were ahead of anything the world had ever seen up to that time. It has cost Europe many millions of dollars to secure a feeling of safety against those old Rodman guns, and yet there is not a really safe, well designed, mechanically constructed great gun in Europe to-day, and it is safe to say there never will be one that is made by hammering or pressing. What America needs is another Rodman to develop his principles again, and so place our armament away in advance of anything that has been done anywhere in the world."

POSITION OF THE PLANETS IN APRIL.

VENUS

is evening star until the 30th, and then morning star. She is in inferior conjunction with the sun on the 30th, at 9 h. P. M., passing between the earth and sun, and reappearing on the sun's western side. Her charming presence in the western sky will be greatly missed, for she has reigned there without a rival for many months, but she will be equally brilliant in the eastern sky as morning star, passing through the same phases in reversed order. Venus sets on the 1st at 9 h. 35 m. P. M. On the 30th she rises at 4 h. 33 m. A. M. Her diameter is 43".2, and she is in the constellation Aries.

JUPITER

is morning star. He is on the meridian on the 1st, at 6 h. 32 m. A. M., and at the close of the month will rise soon after 11 o'clock in the evening. His size and brilliancy are increasing as he approaches the earth, and he is at this stage of his course a beautiful star from midnight till dawn, well worth the trouble of rising early to behold. Jupiter rises on the 1st at 1 h. 11 m. A. M. On the 30th he rises at 11 h. 20 m. P. M. His diameter on the 1st is 37", and he is in the constellation Sagittarius.

SATURN

is evening star. He is on the meridian on the 1st, at 8 h. 23 m. P. M., is retrograding, and slowly increasing his distance from Regulus. On the 13th he is stationary, and on the 17th he changes his course, moving eastward and approaching the bright star. Saturn sets on the 1st at 3 h. 25 m. A. M. On the 30th he sets at 1 h. 32 A. M. His diameter on the 1st is 18".2, and he is in the constellation Cancer.

URANUS

is morning star until the 9th, when he becomes evening star. He is in opposition with the sun on the 9th, when he is at his nearest point to the earth, as far from the sun as possible, rising at sunset and setting at sunrise. He may be readily found on account of his vicinity to Spica, the brilliant star that rises about sunset in the southeast at the time of his opposition. Careful observers will find Uranus about 2° north of Spica, shining as a star of the sixth magnitude. A small telescope will transform the tiny star into a small sphere of a