

**THE HON. BENJAMIN BUTTERWORTH.**

The appointment, and confirmation on April 6 by the United States Senate, of the Hon. Benjamin Butterworth to the responsible office of Commissioner of Patents will, we feel sure, receive the unqualified approval of all practitioners before the Patent Office.

The new Commissioner of Patents accepted the commissionership at the urgent request of President McKinley. Great pressure was also brought to bear upon Mr. Butterworth by the bar of the country without regard to politics, and it is not without considerable pecuniary sacrifice that he takes the position, for which he is so eminently qualified.

Mr. Butterworth is fifty-nine years old and was born in Ohio. He was admitted to the bar in 1861 and commenced the practice of law in Cincinnati. The first public position which he held was that of United States District Attorney for the Southern District of Ohio. He was elected a member of the Ohio Senate, and subsequently, in 1878, was sent to Congress from his district, which was normally Democratic. He was re-elected to the next Congress.

He was Commissioner of Patents during the administration of Chester A. Arthur and made a good record as an incorruptible and efficient commissioner. He served until he resigned to become a member of the Forty-ninth Congress. He was elected afterward to the Fiftieth and Fifty-first Congresses and declined the nomination for the Fifty-second Congress.

While in Congress Mr. Butterworth was admittedly one of the readiest and ablest debaters on the floor of the House and was always the champion of good government and pure politics. Mr. Butterworth was president of the commission sent by the United States government to Europe, to induce the foreign governments to take part in the Chicago World's Fair. After terminating his connection with the Exposition, he gave his entire attention to the practice of law in connection with Mr. Julian C. Dowell. The law firm of Butterworth & Dowell have offices in Washington and Cincinnati. During his tenure of office as Commissioner of Patents Mr. Butterworth compiled a most comprehensive work on "The Growth of Industrial Art." This work gives the history of two hundred of the arts from the rude beginnings up to the most complicated examples of the modern inventors' skill.

Mr. Butterworth's deep interest in the promotion of all public enterprises, industries and inventions, his liberal-mindedness toward inventors and his influence with the representatives of the national legislature, all portend for good in the future, the possible reform of abuses and the placing of the Patent Office on a higher plane of usefulness.

**NO BIDS FOR ARMOR PLATE.**

There were a number of surprised people at the Navy Department on April 8, when bids were opened for supplying the government with 8,000 tons of armor for the battleships Alabama, Illinois, and Wisconsin. It was the first opportunity of the department to test the attitude of the armor plate manufacturers with regard to the stipulation in the Naval Appropriation bill that the average cost of armor to the government should not be more than \$300 a ton. Secretary Long presided at the opening of the bids, and he announced that one bid only had been received. When the so-called bid was examined, it was found to be in the form of two propositions from the Illinois Steel Company, a Chicago concern, neither of a regular character in conformity with the advertisement. Both of these propositions will be rejected.

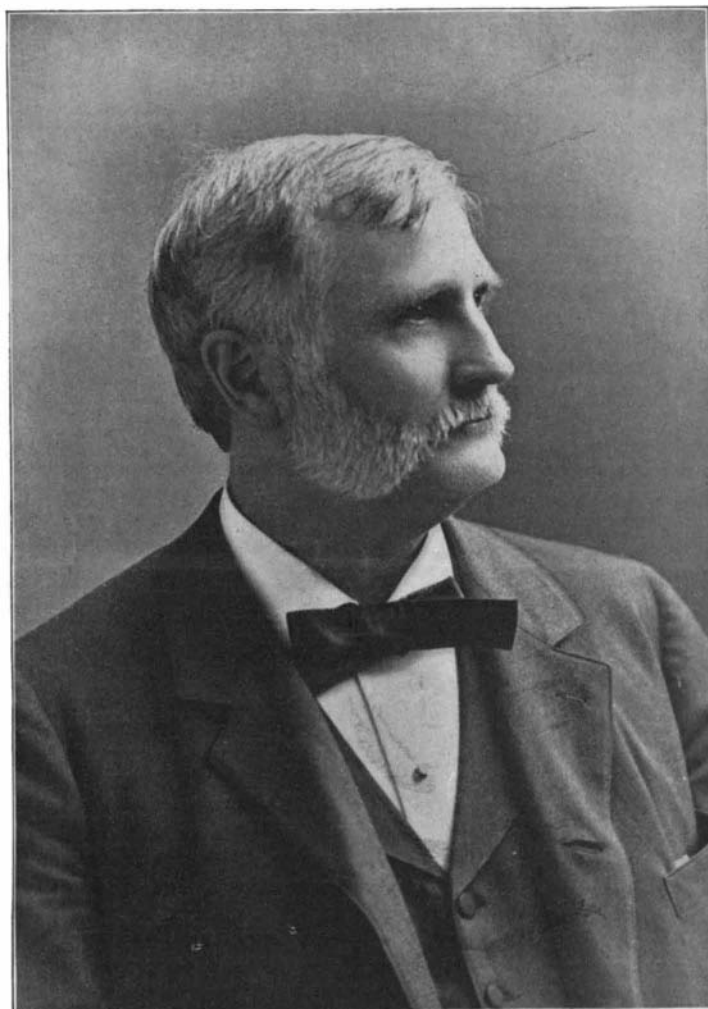
The company offered to furnish the 8,000 tons at \$300 a ton, on condition that Congress would award it a contract for the entire wants of the United States government for armor plate for twenty years. If this were done, the firm would furnish the material at \$240 a ton, provided it did not have to manufacture less than 6,000 tons and more than 12,000 tons annually. The other proposition was curious. It contemplated the erection by the government of its own plant, the Illinois Steel Company to lease it the ground at a nominal figure for ninety-nine years and to furnish open hearth ingots suitable for armor plates.

What the government will do in view of the setback given by the refusals to bid has not been decided. Congress will have to untangle the knot. Meanwhile Secretary Long has reserved his opinion.

ACCORDING to Cosmos the following method has been adopted for testing the hardness of steel balls. A plate of glass is inclined to the horizontal and the balls dropped on this one by one from a definite height. The rebound of the ball, if properly tempered, is sufficient to carry it into the hopper, where the hard balls are thus automatically collected. Soft balls, rebounding less, fall into another receptacle.

**THE POPULATION OF SWITZERLAND.**

The population of Switzerland at the last census (1888) was 2,917,000, and the average increase of population from 1850-88 was 5.1 per 1,000 inhabitants. The same conditions, however, appear to exist in that country as in others, namely, that the population of the industrial districts increases, while that of the agricultural districts tends to decrease. According to the secretary of legation at Berne, the death rate averaged 17.6 per 1,000 in the towns in 1894. Influenza was responsible for 2,275 deaths, as compared with 2,669 in 1890, and only 268 in 1891. The average of deaths from alcoholism was 6.5 per cent of the total. In 1888 there were 229,650 foreigners resident in Switzerland, of whom 112,342 were Germans, 13,000 Austrians, 53,000 French, and 41,000 Italians. The English who come into the country, and who do so much to support the hotel industry, would seem therefore to be mostly of the tourist class, as there were only 2,577 residents. The emigration of Swiss has diminished from 13,502 in 1883 to 3,849 in 1894, and of these 3,285 went to the United States, of whom 1,273 were agriculturists. These official figures do not include the army of Swiss waiters and hotel servants who go abroad annually for the winter months, to the Riviera or elsewhere, and who return home for the summer tourist season. The average number of suicides per 100,000 inhabitants was 22.5, as compared with 7.5 in England and Wales. A



THE HON. BENJAMIN BUTTERWORTH, COMMISSIONER OF PATENTS.

curious coincidence in connection with suicides in Switzerland is that they are about 5 per cent higher on Tuesdays than on any other day in the week, and for men hanging, and for women drowning, appears to be the method of dispatch preferred by each sex.—Journal of the Society of Arts.

**PRODUCTION OF RAIN BY GREAT FIRES.**

In the early part of the century Prof. Espy excited great interest by his lectures on the formation of clouds, rain, and storms, and several, but not many, instances were quoted in which fires in the forest or canebrake were known to have actually produced local rains. An experiment made by Espy, near Washington, was not successful, and, indeed, it is conceded that a very moist condition or a generally unstable condition of the air is needed in order to produce a favorable result. It will, perhaps, be of interest to find that attention had been called to this matter before Espy's time. Thus, in the London Philosophical Transactions for 1708 (see Hutton's Abridgment, vol. v, p. 403) the Archbishop of Dublin says:

"There are three ways of reducing heath and bog to arable land (in the counties of Londonderry and Donegal): the first is by cutting off the scurf of the ground, making up the earth so cut in heaps, and when the sun has dried them setting them on fire; when burnt as much as they can be the heaps are scattered on the ground, and, after plowing, it produces barley, rye, or oats for about three years. The inconveniences of this

method are (1) that the burning defiles the air, causes rain and wind, and is not practicable in a wet summer. . . ."

It may be of historical interest to collect other references to the connection between large fires and subsequent rainfall, says the Monthly Weather Review.

**PRACTICAL DIRECTIONS FOR SOLDERING ALUMINUM.**

Opinions on the best method of soldering aluminum are always of interest, and the following communication from "Solderer" to the Metal Worker is pronounced by aluminum experts to contain some excellent practical directions for soldering aluminum. The "Solderer" says:

I notice the pictures accompanying the article on the "Specimens of Aluminum Soldering," but my attention, however, was more particularly attracted to the statement that the samples shown had not been subjected to the test of time, which has in a number of instances destroyed the hopes of those who thought they had successfully solved the problem of soldering aluminum by a simple method. I have not solved this problem, but have accumulated quite a bit of information on the subject, which may be of interest to those who are laboring in this field. When exposed to the atmosphere an electrical action or chemical action, as it is sometimes called, begins, and either the aluminum or the metals in the solder start oxidizing, which eventually results in a separation of the solder from the aluminum. This action is more rapid when aluminum has been used to manufacture a vessel to contain water. It can readily be seen from this that it is absolutely necessary that the surface of the aluminum must be thoroughly tinned, or protected as far as possible from atmospheric influence, in order to solder readily, and if the joint is to be a lasting one, the protection to the surface of the aluminum must be of a permanent nature. The difficulty in soldering aluminum has been to keep the surface entirely free from oxidation, the fluxes used in soldering other metals not being adapted for it.

Solders that are best adapted for use with aluminum contain a percentage of zinc, or spelter, and those who wish to demonstrate that aluminum can be soldered have only to use stearine as a flux with an ordinary soldering copper and a solder which contains a small percentage of zinc, or that has been prepared on purpose for soldering this metal. It is quite possible that those who are expert in the use of soldering coppers can tin the surface and solder the joint with half and half solder, with stearine as a flux. Those who have soldered tin plate, copper, brass, zinc, and black iron, know that black iron is much more difficult to solder, because the surface must be thoroughly cleaned from all oxide and made bright. Those who have had the most experience do not attempt to solder the iron until it is in a perfectly clean condition. From the fact that aluminum presents a bright appearance, it is too often assumed by those who experiment in soldering it that it may be readily soldered, while in fact as much care must be taken to have its surface perfectly clean as is taken in cleaning the surface of a piece of black sheet iron for soldering. Aluminum solder is made more durable and capable of standing the ravages of time by the addition of a percentage of silver, which immediately adds to the cost and also to the difficulty of soldering, as it must be done with a blowpipe or by some other means by which the high temperature necessary for melting and fusing the solder can be secured.

**THE GUTTA-PERCHA CROP OF 1896.**

The India Rubber World says: Advices from Singapore, dated November 20, record the shipment of gutta-percha, from the beginning of the year to that date, as follows:

	Piculs.	Pounds.
To Great Britain.....	24,231	= 3,290,800
To Europe (Continent).....	15,366	= 2,048,800
To the United States.....	1,418	= 189,067
Totals.....	41,015	= 5,468,667

These figures, for a trifle less than eleven months, are larger than the total shipment of gutta-percha from Singapore for either of the years 1892 or 1893. Unless the shipments were at a larger rate during December, however, it is probable that the total for the year fell below that for most of the years during the past decade. England's share of the total is even greater for the period covered by the table than usual.

**HISTORY OF THE AMERICAN LOCOMOTIVE.**

The series of articles on the history of the American locomotive, which was announced to commence in the present number of the SCIENTIFIC AMERICAN, will be published in the SUPPLEMENT, the first of the series appearing in next week's issue of that journal.