

# A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART. SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XLVIII.-No. 12. [NEW SERIES.]

## NEW YORK, MARCH 24, 1883.

[\$3.20 per Annum. [POSTAGE PREPAID.]

## AMERICAN INDUSTRIES -- No. 87.

THE MANUFACTURE OF PORTABLE FORGES AND BLOWERS. About five years ago, in January, 1878, the industry illustrated herewith bad its foundation in a small shop occupying but a single room and employing only two men, making one style of portable forge and nothing more. The fact that the Buffalo Forge Company, from this small beginning, and in so sbort a space of time, has acquired extensive buildings and now employs a force of 120 men is ample evidence of the enterprise of the company and of the merit of its manufactures. As shown in the engraving, the works comprise a machine shop, foundry, warehouse, and clamp, the Buffalo wagon jack, and a complete line of pul-

the quarters are found too small, and large additions are con templated.

Starting with the intention of making nothing but the first quality of work, the business of the company has naturally and steadily grown, and now seventeen different styles of portable forges and hand blowers are made, which are suitable for all purposes, from the most delicate uses of jewelers and the world. dentists to the heaviest kinds of smith's work. A complete line of power blowers and exhaust fans for every possible duty is made by this company. In addition to the various kinds of blowers, these works turn out the Buffalo cabinetmaker's outlying sbeds. Even with these commodious buildings leys and hangers.

The Buffalo forge has outstripped its predecessors, and may now be found as a staple article of stock in every large hardware and iron house in the country. The steamers leaving New York carry exportorders of these articles to South America, the West Indies, England, Australia, the Netherlands, and in fact to every principal distributing point in

We are told of a tourist lately returned from a tour in the Eastern hemisphere, who says that in all his wanderings the Buffalo forge could be seen, and it served as a continual reminder of home. In the great West, where new railroads are constantly being built, the surveyor with his theodolite is followed by the navvy with his Buffalo forge, and in all the



WORKS OF THE BUFFALO FORGE COMPANY, BUFFALO, N. Y.

© 1883 SCIENTIFIC AMERICAN, INC

shops, great and small, in the mills and factories, the forge is an essential element.

The portable forges made by this company are so well known everywhere that it seems almost superfluous to enter into any detailed description of them. Before the issue of the patents under which these forges are made, all portable forges in the United States were operated, by means of the laborious crank motion, which necessarily confines the operator close to the fire. The chief improvement consists in operating the blower by means of a lever and ratchet, the lever having the swivel motion so natural to the blacksmith. This improvement was recognized immediately, and was one of the novel features that distinguished this style of forge and insured its great success.

The original and novel power blower made by this company for cupolas, forge fires, etc., is deserving of special notice. All blowers previously made had the shell or case made in halves, necessitating the bolting of the parts together around the entire circumference of the blower, resulting in a cumbrous, ill shaped machine at an unnecessary expense. The Buffalo blowers have a shell cast in one solid piece, combining the elements of beauty, strength, and economy, and this, with the improved journal bearings, makes this machine not only low in price, but better in quality than others of the same class.

The shavings exhaust fan for planing mills, furniture and piano factories, and all uses requiring a partial vacuum has a peculiar mouthpiece, by means of which the material to be conveyed may be carried to the right or left, or in both directions if desired, by simply loosening four bolts. The company also manufacture exhaust fans, especially adapted for ventilating mines and all underground apartments; for removing smoke and gas generated in blacksmith shops, chemical works, and factories in general; for removing dust from emery and other polishing wheels, buffing machines, sand wheels, and tumbling machines used in cleaning and polishing castings; for removing offensive odors from try kettles, dyeing works, varnish factories; and for use in packing houses and refrigerating cars, etc.

They also manufacture all the accessories, such as countershafts and pulleys, blast gates, etc.; in fact, everything pertaining to this line of business, from the miniature forge for miners, jewelers, dentists, locksmiths, farmers, and tinsmiths to the mammoth blowers and exhaust fans for the largest uses

The works in which all this variety of manufacture is carried on occupy Nos. 480 to 490 Broadway, and 166 to 182 Mortimer Street, Buffalo, N. Y.

The buildings are shown in the central view of our engraving, and interior views and representations of some of the products are shown in the marginal views.

The first floor of machine shop is 50 x 135 feet, fitted up with special tools for the speedy and economical execution of the work. Prominent among these are a large, special pulley lathe and special pulley borer, built by Niles Tool Works, of Hamilton, O., and kept running to their full capacity. This floor is almost exclusively devoted to fitting up forges and hand blowers.

The second floor is used for fitting and setting up power blowers and exhausters, and on the third floor are found the wood workers, tinsmiths, and painters; on the fourth floor, pattern making department, and experimenting rooms.

The building adjoining is used on the ground floor for blacksmith shop and tumbling rooms, and on upper floor as warehouse and shipping department.

The foundry, situated back of the machine shop and warehouse, is a commodious structure 60 x 100 feet, with two wings, each 30 x 40 feet. It has every facility for first class work, and is fitted up with a view to the comfort of employes.

We are informed that the company has now in hands of the printer a new and complete forty-page catalogue of specialties, making a hand book indispensable to every mechanic and farmer who wishes to keep up with the times, and which they will mail on application to any address.

### -----The Corrosion of Iron and Steel.

M. Gruner recently communicated to the Academie des Sciences some observations on the relative perishability, under certain circumstances, of cast iron, steel, and soft malleable iron. Plates of different composition were immersed during equal periods in water acidulated with 0.5 per cent of sul-  $\Pi$ . phuric acid, and also in sea water, and exposed in moist air. It was found that in moist air chromate steels were most rapidly corroded, and tungsten steels less than carbon steel. In similar conditions cast iron oxidized less than steel and soft iron; and white specular iron rusted less than gray cast iron. Thus hard white cast iron is the best for withstand- II ing damp air-an observation which agrees with common<sup>5</sup> experience. Sea water, on the other hand, attacks cast iron more than steel, and especially the white specular kind. Tempered steel stands in sea water better than the same steel annealed; and soft steel is less attacked than manganese or chromate steel. Acidulated water acts upon gray IV cast iron like sea water, strongly affecting the more impure gray cast iron. White specular iron is not so much affected. These experiments agree with the results obtained by Mallet V in 1843, and are valuable as indicating the best kind of material for iron structures in certain localities and for different purposes. The atmosphere of Manchester and similar places is known to have a very powerful acid reaction, and this circumstance may be taken into account when the material for lofty exposed structures, such as gas holder framings, has VIII. ARCHITECTURE.-Palace of Fine Arts at Rome. Full page to be decided upon. Wrought iron and steel in such localities are thus seen to be exceptionally liable to decay.



Scientific American. ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors. PUBLISHED WEEKLY AT

No. 261 BROADWAY, NEW YORK.

•. D. MUNN.	A. E. BEACH.
-------------	--------------

## TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year postage included	53	20
One copy, six months postage included	1	60
ClubsOne extra copy of THE SCIENTIFIC AMERICAN will be s	upp	lied
gratis for every club of five subscribers at \$3.20 each : additional c	opie	es at
same proportionate rate. Postage prepaid.		

Remit by postal order. Address

MUNN & CO., 261 Broadway, corner of Warren street, New York.

### The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5 00 a year, postage paid, to subscribers Single copies, 19 cents. Sold by all news dealers throughout the country

Combined Rates. - The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year postage free, on receipt of seven dollars. Both papers to one address or different addresses as desired. The sifest way to remit is by draft, postal order, or registered letter. AddressMUNN & CO . 251 Broadway, corner of Warren street, New York.

## Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing : (1.) Most  $\bullet$ i the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMPRICAN, with its splendid engravings and valuable information: (2.) Commercial, trade, and manufacturing announcements of leading houses. Forms for Export Edition, §5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. (FF Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very mode ate cost. The SCIENTIFIC AMBRICAN EXOOT Edition has a large guaranteed circu-

lation in all commercial places throughout the world. Address MUNN & CO., 261 Broadway, corner of Warren street, New York.



## TABLE OF CONTENTS OF

#### THE SCIENTIFIC AMERICAN SUPPLEMENT

## No. 377.

## For the Week ending March 24, 1883.

Price 10 cents. For sale by all newsdealers.

I. ENGINEERING AND MECHANICS .- Wegmann's Porcelain Cyl-

- ..... 6007 nder Mill.--Several figures..... The Iron Railway Bridge over the Saint Leger Valley, France.— Several figures ... Wheel and Rail for Common Roads.-Several figures...... 6011

#### SIX HUNDRED AND FIFTY MILES BY TELEPHONE.

In our last issue we gave an account of recent successful experiments in telephoning over the new wire of the Postal Telegraph Company, between this city and Cleveland, Ohio, a distance of six hundred and fifty miles.

We have now to report the results of further experiments over the same line, made by ourselves on the invitation of the officers of the company. On the 13th inst. we visited the Postal Telegraph Company's headquarters in this citythe large and splendid building No. 49 Broadway. Here we were received by Mr. F. W. Cushing, the able and obliging Manager of the company, who at once placed at our disposal, for the purposes of the experiment, the use of the line wire to Cleveland, with the necessary instruments for transmitting and receiving conversation.

The new wire, as our readers will remember, is composed of steel and copper, its chief peculiarity and merit being its extraordinary conductivity. So great is the facility of the new wire for carrying the electrical current, that sounds and signals may be sent through it for lengths of a hundred miles as easily as through a common wire of ten miles; the new wire thus annihilates space, brings far distant places near together, and realizes the long sought desideratum of easy telegraphic and telephonic communication.

The instrument used by us in this experiment was a Hopkins transmitter, worked by two cells of the Leclanché battery. The principal novelty of this transmitter consists in a carbon electrode that floats on mercury, and the buoyancy of the carbon presses it into contact with the diaphragm of the telephone, without the intervention of spring or weight. The instrument is, therefore, constantly selfadjusting, always operative under the loudest as well as the softest sounds, and admirably suited for general telephonic purposes.

The wire is poled with forty or forty-five poles to the mile, and insulated in the ordinary manner throughout the line, except at the Hudson River, under which it passes in a cable 4,980 feet in length; and by a short cable under the river at Cleveland.

The transmitter was hung upon the wall like the ordinary instruments, and we gave the usual call, "Hullo! Hullo!" to Cleveland. We were instantly answered in clear tones by Mr. C. H. Rudd, the superintendent of the Postal Company in Cleveland. With him we then maintained a telephonic conversation for a considerable time; several other gentlemen in the party did the same, among whom was Mr. G. M. Hopkins, the inventor of the transmitting instrument. Finally, to make the test as thorough as we could, we asked Mr. Rudd to read something from the editorial page of the Cleveland Herald of that morning, which he proceeded to do, his reading being written down by us at this end of the line. He read several items. A day or two following, on the arrival here of the mail from Cleveland of March 13, we obtained a copy of the Herald and found therein, verbalim et literatim, all the items that were read to us by Mr. Rudd.

Those of our readers who have had any considerable experience in telephoning, especially in the city of New York, know that this was a satisfactory test of the Cleveland wire. If the reading of random newspaper items can be intelligently done, then anything may be sent. We have only toadd that the noise from induction was about the same as onour city lines, and we were able to speak to Cleveland and hear the answers with greater ease and satisfaction than we often experience in trying to talk from our office to points in town that are only two or three miles apart.

For the accomplishment of this remarkable result, the opening of telephonic communication for distances of six hundred and fifty miles, the public is indebted to the enterprise of the stockholders and directors of the Postal Telegraph Co. and the corps of able manufacturers, inventors, and electricians whom the company has been so fortunate as to associate with them.

The construction and success of this wire marks the opening of a new and important era in the march of electrical progress. Its benefits and influence will indeed be far reaching. It opens the prospect of a more extensive, bethas ever been employed, or hardly dreamed of as possible. ire will have the business capacity of many common one improved wire will, in fact, enable us to do hat could by no possibility be accomplished by the

PAGE

CHEMISTRY AND METALLURGY.—Extraction of the Precious Metals from all kinds of Ores by Electrolysis. By BLAS and MIEST. 6016 The Analysis of Milk.—2 figures	One wire wires; o things th ordinary The F diameter
I. ELECTRICITY, LIGHT, HEAT, ETC.—Field Telegraph without Battery.—2 figures	weighing strain of extent of tric curr times gr copper b
V. TECHNOLOGY -Practical Methods of Intensifying Gelatin Plates with Silver	has doub when str of low te
. NATURAL HISTORY.—The Devil's Pit. By REV. J. D. PARKER. 6021 British Columbia.—Its climate, resources, and people	Ninety with a re
I. AGRICULTURE AND HORTICULTUREBee Culture in India. 6019 Cypripedium sedeni1 illustration	No. 6 ir
11. MEDICINE AND HYGIENE -PneumoniaBy Dr. FRANCIS DELAFIELDAcute pneumonia of adults -Physical signsRa- tional symptomsComplicationsFatal casesTreatment	of only 1 from Ne

#### wires

Postal Telegraph Company's compound wire has a of  $\frac{7}{32}$  of an inch, consists of a steel wire core, g 200 pounds per mile, that will resist a tensile 1,650 pounds, on which copper is deposited to the 500 pounds per mile, with a resistance to the elec. rent not exceeding 1.7 ohms. The wire has seven reater conductivity than iron wire of equal size, being the best conductor known except silver. It ble the tensile strength of iron wire of equal weight rang on the lines, will last longer, permits the use ension currents and small batteries.

per cent of the wires now in use are No. 9 iron, esistance of 20 ohms per mile, and the very best are ron, with a resistance of 10 ohms, while the comvire to be used by this company has a resistance '7 ohms. The resistance of No. 9 iron wire on a line ew York to Chicago, 1.000 miles, is over 20,000 ohms, and on a No. 6 iron wire over 10.000 ohms, and on the com-