

Table with 4 columns: Cubic feet Timber, Pounds Iron, Cubic yards Stone, Cost. Rows include Temporary Dam, Permanent Dam, Slides, Booms, Piers, and a total row.

DOES GOOD WORK PAY?

Properly considered, this question admits of but one answer, and yet there are advocates of "cheap" work and excusers of slighted jobs among our manufacturers; men who claim that close competition and close bargaining are circumstances which permit, if they do not exact, passable rather than excellent work.

The manufacturer who "puts the work" into his tools and machinery is building up for himself a cumulative extending reputation for excellence of product that is far more valuable than a reputation for low prices only.

The truth of this could be attested by the success of a firm whose productions have a reputation extending far beyond the limits of this country. Their specialty is the manufacture of machine tools, and within less than twenty-five years has grown from a shop of four employes to an establishment of more than seven hundred hands.

This single case, taken as an example for illustration, is not an isolated and peculiar one. There are producers by manufacture in this country and others whose name is a guarantee of excellence, a protection to purchasers and users, and an evidence of the prosperity almost certain to follow earnest, honest endeavor to do good work.

Arizona Coal.

The Deer Creek coal fields, near the San Carlos Reservation, Arizona, promise great results. They were discovered in 1881, and active developments began last March. The coal is found in fifty veins of greater or less size, which have been open, and extends for a full mile in width.

New subscribers to the SCIENTIFIC AMERICAN and SCIENTIFIC AMERICAN SUPPLEMENT, who may desire to have complete volumes, can have the back numbers of either paper sent to them to the commencement of the year.

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 261 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year postage included... \$3 20
One copy, six months postage included... 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

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.

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 safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 261 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 of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information;

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 261 Broadway, corner of Warren street, New York.

NEW YORK, SATURDAY, APRIL 28, 1883.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Aged, an inventor gone', 'Great Bridge, almost completed', 'Hudson River Tunnel', 'Human storage battery', etc., with corresponding page numbers.

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 382,

For the Week ending April 28, 1883.

Price 10 cents. For sale by all newsdealers.

Detailed table of contents for the supplement, categorized by I. ENGINEERING AND MECHANICS, II. ELECTRICITY, LIGHT, AND HEAT, III. MEDICINE AND HYGIENE, IV. NATURAL HISTORY, V. CHEMISTRY, VI. TECHNOLOGY, VII. AGRICULTURE, VIII. MISCELLANEOUS.

THE GREAT BRIDGE ALMOST COMPLETED.

The trustees of the great suspension bridge over the East River, between New York and Brooklyn, have announced that the structure will be thrown open to the public on the 24th day of May, 1883. This will be a notable day in the history of these two large cities.

RELATIVE COSTS OF STREET LIGHTING BY ELECTRICITY AND GAS IN NEW YORK.

New contracts for lighting the streets of the great city of New York have just been awarded, to begin May 1. The price to be paid for gas lighting for the closely inhabited part of the city, in which by far the larger portion of the lamps are located, is \$17.50 per year per light.

The use of electric lights will be continued in portions of Broadway, Fifth Ave., including certain parks and squares, in all a length of about six miles, at 70 cents per night per light. Arc lights are used of the Brush Company, also of the United States Company's styles.

MAKING A DRILL CHUCK.

In these days, when almost every appliance used in the machine shop may be obtained ready-made, at any mechanic's supply store, it may seem unnecessary to suggest methods of fitting ordinary lathe appliances.

There are plenty of handy drill chucks to be found in the market suited to almost all the exigencies of work, but if the contingency just referred to should arise, it is well to know how to produce a good drill chuck from shop materials and appliances.

The preferable method of making a drill chuck to be used in the lathe is to drill, bore, and thread a suitable block to screw on the live arbor of the lathe, in place of the face plate. A cylindrical casting, or a piece cut off the end of a bar of round iron, will furnish the stock for the chuck.

The first stage is now completed. Screw the block on the lathe spindle, and drill, from the other end, the hole for the reception of the drill shank. Turn and finish the outside of the chuck to taste.

Sometimes the workman wants a drill chuck that shall take the place of the center in the lathe arbor. In this case the drill chuck must have a tapering shank corresponding with that of the lathe spindle center.

To produce a chuck of this style, cut a piece off a bar of round iron of the proper diameter for the boss of the chuck, and long enough to receive the shank of the drill and to form the shank of the chuck that takes the place of the shank of the lathe center.

Turn this piece to fit the center hole in the lathe arbor accurately, put it in place, and then turn the projecting portion to fit the hole in the proposed chuck. Drive the chuck on, and by rotating it the true center will be found.

A CUBIC foot of water weighs 62½ pounds, and contains 1,728 cubic inches, or 7½ gallons.