

of iron; and in this country, the proportion of iron to wooden steamers, now in process of construction, is as 21 to 4.

The first iron vessels were built in the same general manner as wooden ones, with iron ribs and sheathing. It soon became evident, however, that the same strength could be secured with much less material, by building vessels in the same manner as beams are made, and hence the introduction of the longitudinal system. This system has now been generally adopted in England for light draft vessels.

In this country, iron vessels have generally been constructed on the transverse system. The vessel proposed by the writer for service in western waters is to be built on the longitudinal system; and the bottom sheathing, to ensure great elasticity for resisting shocks, is not secured to the transverse bulkheads or frames, the connection of the bottom plates being made exclusively to the longitudinal frames. A comparison of this proposed vessel with a wooden steamer of the same general dimensions, is as follows:

	Iron vessel. Tons.	Wooden vessel. Tons.
Hull.....	147	270
Deck.....	112	112
Machinery and wheels.....	93	93
Water in boilers.....	20	20
Joiner work.....	40	40
Fuel, fittings, etc.....	25	25
The total weight.....	437 tons	560 tons
Mean draft.....	26 inches	32 inches
Cost complete.....	\$100,000	\$85,000
Durability.....	20 years	10 years
Value at the end of this time.....	\$20,000	\$15,000
Annual depreciation during service.....	\$4,000	\$7,000
Freight carried on mean draft.....	658 tons	535 tons
Net profit finally.....	\$22,137	\$14,250

A New Use for Chicken Feathers.

Chicken feathers are among those waste products of the farm of which no regular means of utilization has heretofore been suggested. Myriads of them are strewn over the barn yard, packed into the floor of the chicken house, or are converted into positive nuisances by the wind which bestrews them over lawns and flower beds, or drives them into open doors and windows. The down alone, we believe, occasionally used as a stuffing for pillows or cushions, and sometimes employed as an adulteration in goose feathers; but the long plumes of the wings, sides, and tail of the bird, unless made into rude bundles to serve as dusters for the housewife, are generally regarded as totally worthless.

According to statistics very carefully compiled," says a writer in *La Nature*, "we throw away yearly a quantity of chicken feathers, the intrinsic value of which is equal to the money which we pay out for cotton." A startling statement, but the author considers it true; and he proceeds to explain how the feathers are prepared to render them valuable: The operation is to cut the plume portions of the feathers from the stem, by means of ordinary hand scissors. The former are placed in quantities in a coarse bag, which, when full, is closed and subjected to a thorough kneading with the hands. At the end of five minutes, the feathers, it is stated, become disaggregated and felted together, forming a down, perfectly homogeneous and of great lightness. It is even lighter than natural eider down, because the latter contains the ribs of the feathers, which give extra weight. The material thus prepared is worth, and readily sells in Paris for, about two dollars a pound. About 16 troy ounces of this down can be obtained from the feathers of an ordinary sized pullet; and this on the above valuation, is worth about 20 cents. It is suggested that, through the winter, children might collect all the feathers about a farm, and cut the ribs out as we have stated. By the spring time a large quantity of down would be prepared, which could be disposed of to upholsterers, or employed for domestic uses. Goose feathers may be treated in a similar manner, and thus two thirds of the product of the bird utilized, instead of only about one fifth, as it is at present the case.

The chicken down is said to form a beautiful cloth when woven. For about a square yard of the material, a pound and a half of down is required. The fabric is said to be almost indestructible, as, in place of fraying or wearing out at folds, it only seems to felt the tighter. It takes dye readily, and is thoroughly waterproof. There appears to be a good opportunity here for some ingenious person to invent machines to cut and treat the feathers.

Bergen Hill Tunnel.

Work on the Bergen Hill tunnel, for the Delaware, Lackawanna and Western Railroad, has been lately commenced in earnest. Seven shafts are to be sunk, and 500 men kept at work day and night. The tunnel begins on the east side at the foot of Ferry street, Hoboken, and will be considerably above the Erie tunnel. The track will be elevated above the Erie road, at the west end, on a trestle, thus avoiding the danger and delay of crossing. It will take two and a half or three years to complete the tunnel.

IMPORTANCE OF ADVERTISING.

The value of advertising is so well understood by old established business firms that a hint to them is unnecessary; but to persons establishing a new business, or having for sale a new article, or wishing to sell a patent, or find a manufacturer to work it: upon such a class, we would impress the importance of advertising. The next thing to be considered is the medium through which to do it.

In this matter, discretion is to be used at first; but experience will soon determine that papers or magazines having the largest circulation, among

the class of persons most likely to be interested in the article for sale, will be the cheapest, and bring the quickest returns. To the manufacturer of all kinds of machinery, and to the vendors of any new article in the mechanical line, we believe there is no other source from which the advertiser can get as speedy returns as through the advertising columns of the SCIENTIFIC AMERICAN.

We do not make these suggestions merely to increase our advertising patronage, but to direct persons how to increase their own business.

The SCIENTIFIC AMERICAN has a circulation of more than 12,000 copies per week, which is probably greater than the combined circulation of all the other papers of its kind published in the world.

Inventions Patented in England by Americans.

- [Compiled from the Commissioners of Patents' Journal.]
From January 14 to January 15, 1874, inclusive.
- ENGINE, PUMP, ETC.—W. D. Hooker, San Francisco, Cal.
 - FILTERING LIQUIDS, GASES, ETC.—T. R. Sinclair, New York city.
 - GRINDING MACHINE.—C. Heaton, New York city.
 - MAKING SCREWS, ETC.—E. Nugent et al., Brooklyn, N. Y.

DECISIONS OF THE COURTS.

United States Circuit Court—Northern District of Illinois.

SHINGLE MACHINE PATENT.—HARRY H. EVARTS et al. vs. DAVID M. FORD.
[In equity.—Before Blodgett, District Judge.—Decided November 26, 1873.]
This suit was brought to recover damages for an alleged infringement of a patent for an improvement in shingle machines, issued to H. H. Everts, dated October 1, 1854, and extended for a term of seven years from October 1, 1868.

The court held substantially as follows:
A claim for "presenting the sides of the fibers of the wood to the action of the saws in the sawing of shingles or equivalent articles, for the purpose of giving them smoother surfaces than can be produced by the usual mode of sawing, if construed literally, asserts a right to a result, and cannot be sustained."

But if read as it should be with the specification, and interpreted to embrace the mechanism therein described, by which the result is accomplished, it is a valid claim.

A patent for a machine, in which a shingle bolt is automatically fastened by dogging teeth upon a rotating carriage which presents it sidewise to the action of a circular saw, is not infringed by a machine in which the bolt is by hand fastened to a reciprocating carriage and shoved up to the saw.

No recovery can be had upon a patent for using a machine which is neither described nor claimed in it, although the machine was originally devised by the patentee in the course of his experiments, which result in producing the patented machine, and although it has been the most extensively adopted.

If the patentee omits to notice in his patent the intermediate machines he produced in the course of his experiments, he must be presumed to have abandoned them.

The opinion of the Commissioner of Patents granting an extension is entitled to consideration on the question of novelty, but not on a question of infringement.

Bill dismissed.
L. L. Coburn, for complainants.
West & Bond, for defendant.

United States Circuit Court—District of Massachusetts.

PRINTING PRESS PATENT.—CYRIL C. CHILD vs. BOSTON AND FAIRHAVEN IRON WORKS.

[In Equity.—Before Shepley, Judge.—Decided January 1, 1873.]
Letters patent No. 98,037 were granted December 21, 1869, to Charles Montague, assignee to Cyril C. Child, the plaintiff, for improvement in printing presses. This invention consisted—

1. In the use of a vibrating lever for moving the type bed, constructed in two parts, one of which is made to slide out and into the other somewhat like the joints of a telescope, so that the upper end of the lever may be attached directly to the under side of the bed (dispensing with the use of a link) and move in a direct line with the bed, the upper portion of the said lever to the point of attachment to the bed is greater or less in the different parts of the movement of the bed.

The plaintiff's claim is for the extensible vibrating lever in combination with a reciprocating type bed substantially as described.

Defendants admit the manufacture and sale of printing presses containing the extensible vibrating lever in combination with a reciprocating type bed, as described in complainant's patent.

The answer sets up in defense that Montague was not the original and first inventor, and also that the invention set forth in the plaintiff's patent had been in public use more than two years before the application of Montague. To sustain the defense of prior knowledge and use, respondents undertake to prove that one B. F. Leonard was the inventor. Leonard was in the employ of respondents as first superintendent at the time that they claimed to have made the first printing press of the type now in issue, and was the first inventor because he made or aided in making the first machine.

The judge held substantially as follows:
More than three years after the patentee had shown a drawing of his invention to several persons, and a year and a half after it had been embodied for him by the respondents in a working machine, a workman of theirs described it in a sworn caveat, which was never filed, and this was held not to constitute the plaintiff's novelty.

An old combination employed in a new organization, and producing a new result by a new mode of operation, is patentable.

The plaintiff's patent was for a printing press in which an equable and regular reciprocating movement was given to the platen automatically by means of a lever driven by a crank, and having a telescope joint by which its length was accommodated to its position, and the patent was sustained, and the respondents' former mode of perfecting the same. This caveat was prepared and made oath to, but never filed in the Patent Office. This was more than three years after Montague had exhibited to two or three persons his drawing representing his improvements, and a year and a half after the respondents had made for Montague the Byington press. The testimony is conclusive that this is only one more of the too frequent instances in which a person, engaged as a mechanic or constructor in embodying an inventor's patent in a particular form, attempts to prove that he was the first inventor because he made or aided in making the first machine.

The patent held valid also for similar reasons, although the patentee had for two years previous to applying for it manufactured and sold printing presses in which a reciprocating movement was given to the platen by a lever, and the plaintiff's novelty was destroyed.

The patent adjudged to be good and valid, and decree for complainants for injunction and account, as prayed for in the bill.

E. P. Bronson, for complainant.
T. M. Stetson, for defendants.

NEW BOOKS AND PUBLICATIONS.

HUSSEY'S NATIONAL COTTAGE ARCHITECTURE, or Homes for Every One. By E. C. Hussey, Architect. Price \$6. Published by George E. Woodward, and sold by Orange Judd & Co., New York.

This work is a collection of sixty-three plates of pleasing and tasteful architectural designs for suburban homes, ranging from the modest cottage to ornate and handsome villas. The drawings are accompanied with full details, estimates of cost, hints as to construction, specifications, and enough general descriptive matter to enable the searcher for an appropriate plan for a projected dwelling to determine at once whether any in the pages before him will or will not meet exactly his requirements. A table of prices of building materials is added. The volume is elegantly printed on toned paper, and the plates are executed in the best style of lithography. Altogether, it is a useful and attractive book for residents in the country contemplating building. It seems to possess more originality in its designs than any work of its kind lately published.

AN ELEMENTARY COURSE OF PERMANENT FORTIFICATION. By D. H. Mahan, LL.D. Revised and Edited by Brevet Colonel J. B. Wheeler, Professor of Military and Civil Engineering, United States Military Academy. Price \$6.50. New York: John Wiley & Son, 15 Astor Place.

Professor Mahan's text books on civil engineering and field and permanent fortifications are so widely and generally known that it is unnecessary to allude to the volume before us, other than as a standard work of its

class. The reviser, in the new edition, has supplied several alterations and omissions in the original text, and made various necessary improvements. Prominence is given to the bastioned system over others, as it is considered as having best withstood the test of experience, and Nolze's method is carefully explained. The book is used for instruction at West Point. A large number of lithographic plates are supplied, together with the regular engravings in the text.

A TREATISE ON ASTRONOMY, SPHERICAL AND PHYSICAL, with Astronomical Problems and Tables. By William A. Norton. M. A. New York: John Wiley & Son, 15 Astor Place.

The fourth edition of this standard work appears in an entirely remodeled form, with many of its most important chapters wholly rewritten, and is, in brief, a complete exposition of the present condition of the science of astronomy from both a theoretical and practical point of view. The results of recent investigations concerning the physical constitution of the heavenly bodies are given in full, together with the author's own researches on the sun and the comets. A new and more accurate mode of determining the sun's parallax and mean distance from the earth is presented for the first time in an American treatise, and a description is also added of the astronomical observations for finding the latitude and longitude of a place as cited by the United States Coast Survey. A number of valuable tables, together with several new illustrations, conclude the volume.

ART CULTURE, a Handbook of Art Technicalities and Criticisms, selected from the works of John Ruskin. Arranged and supplemented by Rev. W. H. Platt. New York: John Wiley & Son, 15 Astor Place.

As indicated by its title, this work is a compilation from the original and exhaustive writings on art criticism which have been given to the world by perhaps the greatest living art critic. It is intended for educational purposes, and aims to give the student a thorough appreciation, based upon the correct principles of a true and refined taste, of the handwork of the painter, the architect, and the sculptor. There is enough of the technical in the volume to render it a valuable guide to the artist, and many chapters notably those on color, light, perspective, sketching from Nature, &c., are eminently practical and clear in direction and precept. A profusion of admirable illustrations, mainly extracted from the complete works of Ruskin, are interspersed, and serve materially to elucidate the principles laid down in the text. A glossary of artistic terms and an alphabetical index of artists, sculptors, and architects referred to, are added. Press work and binding are alike excellent.

Recent American and Foreign Patents.

Improved Mole Trap.

Robert I. Huggins, Bethel, O.—To locate the trap, the earth is pressed gently down, so as to fill the burrow, and the trap is set directly above, with sill pieces parallel with the burrow, and with a cross piece on such depression. The mole, finding its hole obstructed, will commence repairing damages, and in forcing its body through the old track the cross piece will be raised, which raises a rod, and this, acting on a lever, releases a cross head which drops with its teeth on each side of the cross piece. The teeth penetrate the ground and spear the mole.

Improved Windlass and Crank for Brakes.

Henry M. Howard, Brooklyn, assignor to John Stephenson, New York city.—The windlass, around the lower end of which the brake chain is wound, is made polygonal, with the upper end reduced in size with a loose collar placed thereon, which is kept in position by a screw nut. The crank has two pairs of jaws. The former is made to fit two opposite sides of the windlass, and the latter are attached, by swivel pins, to the loose collar. By raising the outer end of the crank, the jaws will be detached from the windlass and the crank may be turned round to allow the jaws to engage with any other two of the sides of the windlass. By this means the driver is enabled to take a hold of the windlass that will allow him to exert the required strength to the best advantage. When the brake is not in use, as, for instance, when the car is reversed, the crank may be thrown over so as to hang out of the way.

Improved Sash Fastener.

John G. Spathelf, Sandusky, O.—This invention consists of a casing with bolt and lever arrangement, which catches into recesses of the window frame, and is withdrawn by pressure of the finger upon it, returning into the original position by a suitable spring. On releasing the button, the action of the spring will force the lever into the next recess, fastening thereby the window at that point.

Improved Road Scraper.

Thomas M. Tate, Longview, Texas.—This invention relates to means whereby road scrapers may be loaded with more facility, drawn with less expenditure of muscular power, and made to perform an increased amount of work in a given time. The invention consists in combining with a road scraper two front wheels, movable, to let them below or carry them above the bottom of scraper: in end-angled levers, having journals and fulcrum pivots combined with wheels and bearings in the sides of the scraper; in levers connected by a bar and combined with shoulders on scrapers, and a spring latch working therethrough; and in combining with the latch, held forward by a spring, a cross bar and arm of the latch lever.

Improved Lantern.

Joseph Kintz, West Meriden, Conn., assignor to himself and P. J. Clark of same place.—The object of the construction is to facilitate insertion and removal of globes and clamping or securing them between the base and top of the lantern. The vertical guards are hooked into the top through holes in the sides so that the top can swing sidewise. They are also hooked into the bottom in slots, so that they can move up and down in them to some extent. The guards are so adjusted as to length that, when down to the lower ends of the slots, the globe will rest on its seat and the top will rest on the globe, and when they are raised up in the slots as high as they will go, the top will swing off or on the globe. They are to be pressed down by inclines, formed by notching a ring which is fitted around the bottom of the lantern, and adapted to be reciprocated to fasten or unfasten the globe by acting upon the guard wires. The horizontal guards are connected to bent pieces, and the latter are arranged so that they will slip down on the vertical guards and hold fast at the bulge so as to hold the horizontal guards in place, and, at the same time, stiffen the bottom, globe, and top against lateral motion.

Improved Car Coupling.

Frank A. Markley, Waynesborough, Va.—This invention relates to car coupling generally, but more particularly to that class of them in which is employed a link with spring grapple at each end. The invention consists in pivoting the spring catches to the hook piece as nearly as possible in the same transverse median plane, in order to shorten the coupling link, and allow the cars to come as closely together as possible. It also consists in arranging a projection at one side of the rear concavity of link slot, so far as to arrest any lateral pressure of pin against the spring latch, and thereby prevent any chance of accidental uncoupling. It also consists in using slight side latches, and thus throw the main weight and strength of the metal into that part of the link which is expected to take the strain.

Improvement in Boots and Shoes.

James McMillin, Ripley, O.—This invention contemplates the use of a wedge as a remedy for the tendency which so generally exists to wear the heel of a shoe or boot on one side. If the tendency is to wear out the subjacent edge of heel on the inner side, the thicker part of wedge is caused to abut against the corresponding side of the upper, thus throwing the strain toward the center, and not only preventing the edge wear on heel, but tending gradually to correct a slovenly habit of twisting the ankle when the weight is pressing thereon in standing or walking. If the wear should be usually on the other side of the heel, the wedge piece is reversed in position, and is in like manner productive of the same result.