of ron; 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 man ner 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 introduc tion of the longitudinal system. This system has now been generally adopted in England for light drait vessels.
In this country, iron vessels have generally been con structed 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 ensue great elasticity for resisting shocks, is not secured to the transverse bulkheads or frames, the connection of the bot tom plates being made exclusively to the longitudinal frames A comparieon of this proposed vessel with a wooden steame of the same geveral dir: nsions, is as follows

|  | Irou vessel. Tuns. | Wooden vessel. Tuns. |
| :---: | :---: | :---: |
|  | 4 | 2.1 |
| Deck | 112 | 11? |
| Wachincry and wheels | 93 | 9:; |
| Water in boilers. | 21) | 20 |
| Joiner wort | 41 | 4) |
| Fued, fittingrsete | 3.5 | 25 |
| The total weight. | , \%iatur | Sto tums |
| Mean draft | 2 inches | 32 inc |
| Cost complete | 8100,0)00 | \$85, (1)0) |
| Durability. | 20 years | 10 vears |
| Value at the - nd of this $t$ | \$20,00\% | \$15,0\%) |
| Annual deperciation during vice. | r-1 | \$7,000 |
| Freisht earied on mean draft. | (6,T) tuas | 3iju tuns |
| Net profit finally. | S02, 1:3\% | *14.9.0) |

## 1 New Use for Chicken Feathern.

Chicken fearhers are among those waste products of the farm of whici no regular means of utilization has hereto fore been suggested. Mgriads of them are strewn over the jarn yard, packed into the floor of the chicken house, or are converted into positive nuisances by the wind which be strems them over lawns and Hower beds, or drives them into opel: doors and windows. The down alone is, we believe occa-ionally used as a stutfing for pillows or cushions, and sometimes employed as an adulteration in goose feathers; but the long plumes of the wiogs, sides, and tail of the bird, unless made into rude bundles to serve as dusters for the hourewife, are generally regarded as totally worthless.

Accoraing to statistics very carefully compiled," says a writer in Lac Nuturr," we throw away yearly a quantity of chicken feathers, the intrinsic value of which is equal to the money whicin we pay out for cotton." A startling state ment, but the author considers it true; and he proceeds to xplain how the feuthers are prepared to render them valua. ble: The operation is to cut the plume portions of the feathers from the stem, by nueaus 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 down, perfectly homogeneous and of great lightness. It is ven lighter than natural eider down, because the latter con tains the ribs of the feathers, which give extra weight. The material thus prepared is worth, and readily sells in Paris for, aboat two doliars a pound. About $1 \cdot 6$ troy ounces of his down can be obtained from the feathers of an ordinary ized pullet ; and this on, the aloove raluation, is worth about 20 eents. It is suggested that, through tine 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 fi down would be prepared, which could be disposed of to pholsterers, or employed for domestic uses. Goose feathers nay be treated in a similar manner, and thus two thirds of the product of the bird utilized, instead of only about one fth, as it is a! present the case.
The chicken down is said to form a beautiful cloth when woven. For about a square yard of the material, a pounc 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 good opportunity here for someingenious person to invent machines to cut and treat the feathers.

## Bergen Hill Tunnel.

Work on the Bergen Hill tunnel, for the Delaware, Lack wanna and Western Railroad, has been lately commenced in earnest. Serev shafts are to be sunk, and 500 men kep at work day'and night. The tunnel begins on the east side the foot of Ferry street. Hoboken, and will be consid erably above the Erie tunnel. The track will be elevated above the Erie road, at the west end, on a trestle, thus avoid ing the danger and delay of crossing. It wili take two and a half or three year: to compilde the tunnel.

## MPORTANCE OF ADVERTISING.

The value of advertising is so well understood by old established business frms that a hint to them is unneces absishing a new business, or having for sale a new article, or wishing to sell a patent, or fin ance of advertistug. The nest thing to considered is the medfum
hrough whith to do it
determine that papers or magazines having the largest circulation, among
he class of persons most likely to be interested in the article for sale, will
e the cheapest, and bring the quickest returns. To the manufacturer o all kinds of machinery, and to the vendors of any new article in the nechantcal line, we belfeve there is no other source from which the adver
iser canget as speedy returns as through the advertisting colmme of the Scientific americin.
We do not make these suggestions merely to increase our advertsing patronage, but to direct persons how to increase their own busincess. The Scientific Americas han a circulation of more than 12,000 copie per week, which is probably greater than the comb
the other papers of its kind published th the world.

Inventions Patented in England by Americans From January it to January 15 , 1874, Inclusive.
Enane, Pcmp, etc. - W. D. Hooker, San Francisco, Cal. filtering liqitids, Gases, etc.-T. R. Staclaire, New York (ity Making Screws. etc.-E. Nugent ot all, Brookly

## DECISIONS OF THE COURTS.

 setts. ron work


NEW BOOKS AND PUBLICATIONS.
Hussey's National Cottage architectuiee, or Homes for Every One. By E. C. Hussey, Architect. Price \$(
Published b. George E. Woodward, and sold b, Orange Judd \& Co., New York
This work is a collection of sixty-three plates of oleasing and tastefu architectural designs for suburban homes, ranging from the modest cot-
tage to ornate and handsome villas. The drawings are accompanied with ull detalls, cstimates of cost, hints as to construction, specifications, and nougligeneal descriptlve matter to enable the searche: for an appropriate plan for a projected dwelling to determine at once whether any in the of prices of bulding materials is added. The volume is elegantly printed on toned paper, and tie plates are executed in the best style of lithogra phy. Altogether, it is a useful and attractive book for residents in the
country concemplating butling. It seems to possess more originality in country contemplating building. It seems to possess
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
Enginnering, United States Military Academy. Price * 0.50 . New York : John Wiley \& Son, 15 Astor Place.

Professor Mahan's text books on civil engineering and ficid and perma-
ent fortifications are so widely and gcnerally bnown that it ts unnecessary
to allude to the volume before uf, other than as a brandiard work of it
ass. The reviser, in thene $w$ edition, has suppied several alterations an
missions in the original text, and made various necessary improvements. Prominence is given to the bastioned system over others. as it is consid red as having best withstood the test of experience, and Noizet's metho is carefully explained. The book is used for instruction at West Point A large number of ithograp

Treatise on astronomy, Spherical and Physical, with Astrononical Problems and Tables. By Willia m
A. Norton, M. A. New York: John Wiley \& Son, 15 A. Norton,

The fourth edition of this standard work appears in an entirely remod
 science of astronomy from both a theoreticaland practical point of view. The results of recent investigations concernlug the physical constitution of the heavenly bodlen are given in full, together with the anthor's own researches on the sun and the comets. A new and more accurate mode of seterminmg the sun's parallax and mean distance from the earth is preadded of the astronomical observations for tinding the latitude and longiduat a diace ascited hy the United States Coast Suncy. A number of valuable
volume.
Art C'ulture, a Handbook of Art Technicalities and Criti cisms, selected from the works of John Ruskin. Ar-
ranged and supplemented by Rev. W. H. Platt. New ranged and supplemented by Rev. W. H.
York: John Wiley \& Son, 15 Astor Place.
Asindicated by its title, this work is a compilation from the original and exumstive writings on art criticisul which have been given to the world by
perhaps the greatest living art critic. It is int nded for educational purperhaps the greatest living art critic. It is Int inded for educational pur
poses, an'l u'ms to give the studenta thorouzh appreciation, based upon the correct principles of a trueand retthed taste, of the handiwork of the painter, the architect. and the sculptor. There is enough of the technica in the volume to render it a valu ble gulde to the artist, and many chapters notably those ou color, light, persp'ctive, \&ketching from Nature, \&c. . are eminently practical and clear in direction and precept. A profusion of admirable minstrat erspers surve materially to eluctuate the principles bld 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

## cerent gumerican and forcign eatents.

Improved Mole Trap.
Pobert 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
 ion. The mole, inding its hole obstructed, will commence repairing dam-
ages, and in forcing its body through the old track the cross plece 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 plece. The teeth penetrate the groundand spear the mole.

Improved Windlass and Crank for Braken.
Henry M. Howard, Brooklyn, assignor to John Stephenson, New York wounc. is made polygonal, with the upper end reduced in size with enain is collar placed thereon, which is kept in position bya screw nut. The crank has two pars of jaws. The formeris made to ft two opposite sides of the
windlass, and the latter are attached hy 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,
forinstance, whenthecaris reversed, the crankmay be thrown over so as forinstance, whentheca
to hang out of the way.
 bolt and leverarrangement, 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.

Thumas 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 uade to perform an increasedamount of work in a given time. The invention consists in combining with a road
craper t wo front wheels, ino vable, to let them below or carry them abover scraper two front wheels, ino vable, 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 bearingsin the sides of the scraper; in levers connected by a bar and combined with shoulders on scrapers, and a
spring latch working therethrougli : and in combining with the latch, held for ward by a sprint:, a cross bar and arm of the latch lever.

## mproved Lantern.

Joseph Ktutz, West Meriden, Comn., assignor to himself and P. J. Clark
Of same place.-The object of the construction is to facilitate insertion 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 canswing sidewise. They arealso hooked holes in the sides so that the top canswing sidewise. They are also heoked
into the bottomin slots, so that they can move up and down in tbem to some extent. The guardsare so adjusted as to length that, when down to the lower ends of the slots, the globe will reston 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 bepressed down
oy inclines, rormed by notching a ring which is fitted around the bottom of oy inclines, rormed by notching a ring which is itted aroand the bottom of the lantern, and adapted to be reciprocated to fasten ordanal connected to
hy acting upon the guard wires. The horizontal guards are con bent pleces, and the latter are arranged so that they will slip down on the vertical guards andholld fast at the bulge so as to hold thehorizontal guards in place, and, at the same time. atiffen the bottom, globe, and top against lateral motion.

## Improved Car Conpling.

Frank A. Markley, Waynesborougu, Va.- Mise 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 allow the ciandian plane, in order to shorten the coupling link, and arranging cars to come as closely together as possible. It also consists in so faras to arrestany lateral pressure of pin against thespring latch, and thereby prevent any chance of accidental uncoupling. It also consists, in using slig! t side latches, and thus throw the main weight und strengtho
the metalinto that part of the link which is expected to take the strain.

Improvement in Boots and Shoes.
James McMullin, Ripley, 0 . The wedge as a remedy for the tendency If the tendency is to wear out the sub-
heel of a shoe or boot on one side. If jacent edge of heel on the innerslde, the thicker part of wedge is caused to abut against the corresponding slde of the apper, thus throwing the strain toward the center, and not only preventing the edge wear on heel. out tending gradualy to correcta sioveny hat or walking. If the wear should be usually on the other side of the heel, the wedge plece is reverser! in position, and is in like manner productive of the same result.

