

is worth its face in the markets of the world; with business no longer perplexed and crippled by an uncertain and fluctuating standard; with credit which, according to Daniel Webster, is 'the vital air of modern commerce,' upon a sound and stable basis; with restored hopefulness and confidence, shared alike by the capitalist, the business man, and by the laborer; with agricultural crops and products abundant and readily salable at fair prices; with our manufactures seeking and finding a market in foreign countries to an extent never known before; with our natural burdens of debt and taxation becoming every year less difficult to manage and carry; with our country maintaining honorable and peaceful relations with all mankind; the merchants, the manufacturers, and the working men of Cincinnati may well be congratulated that at such a time their countrymen have assembled from far and near to enjoy and be instructed by this great Exhibition. We thank you for the invitation which we in such countless numbers have accepted; for your hospitality, and for your welcome to Cincinnati, a city which, standing, as it does, nearer than any other great city to the center of the population of the United States, may be rightfully called the 'Central City of America.'

COPYRIGHTING FRUIT.

One of our contemporaries published a long account the other day of an Illinois nurseryman who claims to have secured a copyright on the propagation of certain varieties of cherries.

Our newspaper neighbor copied from the nurseryman's catalogue a description of his new cherries as follows: "Please take notice that the names, description, and numbers of these cherries are copyrighted, and therefore my individual and exclusive property, and any one infringing on my rights under the copyright laws of the United States, will be prosecuted," after which follows a list of his copyrighted cherries, which he offers to sell the trees of, to nurserymen in different states after they have purchased the copyright to grow them. He describes some forty-five new varieties, and says he shall produce some twenty more next year. The advertised price of the trees is 50 cents each, but he seems to be in more doubt about the value of his copyright, for he asks fruit growers to make a bid for the latter, but adds that no offer of less than \$50 for a State will be accepted. Not crediting the advertiser's statement of having a copyright on his cherries we have caused search to be made in the Library of Congress and also at the Patent Office, and we learn that no such copyright has been granted from either bureau. For many years the subject of protection to horticulturists and others for new varieties of fruits and flowers has been discussed, but the difficulty of defining such discoveries, they being gradually brought to their perfection by the experiments of different gardeners, has prevented the possibility of legislation on the subject, and there seems no practical way of affording protection to such discoveries.

Sounding Niagara River.

The United States Corps of Engineers has recently had the Niagara river sounded, a task never before accomplished, owing to the bungling and unscientific means employed by those who attempted it. Bars of railroad iron, pails of stones, and all unreasonable bulky and awkward instruments had been attached to long lines, and cast off the railway bridge and elsewhere, but positively refused to sink. The very bulk of the instruments was sufficient, no matter what their weight, to give the powerful under-current a way to buoy them up upon the surface, or near it. By means of a small lead weighing twelve pounds, however, and a slender cord, the depths from the falls to the lower bridge were easily obtained. One of the sounding party says that the approach to the falls in a small boat was made with great difficulty. Great jets of water were thrown out from the falls far into the stream, and the roar was so terrible that no other sound could be heard. The leadman cast the line, which passed rapidly down and told off 83 feet. This was quite near the shore. Passing out of the friendly eddy which had aided them in approaching the falls, they shot rapidly down stream. The next cast of the lead told off 100 feet, deepening to 192 feet at the inclined railway. The average depth to the Swift Drift, where the river suddenly becomes narrow, with a velocity too great to be measured, was 153 feet. Just under the lower bridge the whirlpool rapids set in, and so violently are the waters moved that they rise like ocean waves to the height of twenty feet. Here the depth was computed to be 210 feet.

THE SOCIAL SCIENCE ASSOCIATION.

The annual meeting of the American Social Science Association began in Saratoga, September 9, with a fair attendance of members. F. B. Sanborn, the acting Secretary, read a report giving an account of the origin, aim, and scope of the organization, which now has members in thirty-eight States and Territories. Touching the definition of social science, Mr. Sanborn said: "By strict rules it must be admitted that the term 'science' cannot be applied to our pursuits in the same sense that it describes the researches of the geologist, the chemist, or astronomer. There is a margin, however, in social science for much besides the close inductive or deductive processes by which Newton, Agassiz, or Faraday arrived at their splendid results. The methods of acquiring all human knowledge are essentially the same. The conduct of a nation in a grave political crisis is not to be calculated like the elements in an eclipse, yet it may be foreseen within certain limits. Many problems

in social science are in their nature both scientific and philanthropic. What can be more prosaic than to be inspecting the entries and drains of tenement houses, the condition of sewers and water pipes, or inquiring about the rent of dirty rooms, the cost of pauper relief, the labor or idleness of a population hanging on the verge of pauperism? Yet this is exactly what the Social Science Associations of England and America, the only ones in the world, have been doing."

The second day, President Barnard, of Columbia College, read a paper on "International Coinage," and also presented his paper on "Monometallism, Bimetallism, and International Coinage," prepared for the Association for the Reform and Codification of the Law of Nations, at the August meeting in London. Mr. Barnard proposes to make one gramme of gold the standard of value, and to have the smallest international coin of ten grammes, equal to \$6 less two cents.

President Porter, of Yale College, presented an able paper on "Modern Education, its Opportunities and Perils," which was read in his absence. One of the great perils was found in the circumstance that in aiming to be too scientific in form, modern education often fails to be scientific in fact—due very largely, we apprehend, to the antecedent circumstance that the text book makers and teachers lack an adequate training in genuine scientific methods.

The regulation and control of the degree-conferring power in American colleges formed the subject of another paper by President Barnard, who thought that if the multitude of superfluous collegiate institutions were deprived of the degree-conferring power, they would do no harm, and might, perhaps, do some good. France, Germany, Italy, and other countries of Continental Europe, are full of lycées, gymnasia, and colleges, where instruction in all branches is as extensive as in the average American college, and generally a great deal more thorough, but which are without power to confer degrees. The British colleges cannot confer degrees, not even those which form a part of the great Universities of Oxford and Cambridge themselves. All England, with a population of 23,000,000, has only four universities; the State of Ohio, with 3,000,000 population, has thirty-seven. All France, with a population of 36,000,000, has only fifteen universities, which, moreover, are actually branches of a single one. Germany, with a population of 42,000,000, has only twenty-two universities, or one to 2,000,000 of inhabitants. All Europe, with a population of 300,000,000, has only 101 universities, or one to 3,000,000 people. Our own country, with a population of 45,000,000, has 425 universities, or one to every 100,000 people. Further on, he spoke of the general weakness of our over numerous degree-conferring institutions, and remarked that a university, in a proper sense of the word, is a costly establishment. It cannot be created by a mere act of legislature. A fiat university is worth no more than a fiat dollar. We have some universities in this country whose resources are in some degree correspondent to their responsibilities; but we have not one whose power of usefulness is not constantly held in check by insufficiency of means.

Professor A. P. Peabody, of Harvard, read a paper on female suffrage in connection with school elections, in which he urged that women should vote and hold office in school matters, because they in general far surpass men in educational ability, tact, experience, knowledge, and wisdom. The work is proper for women, and they ought to do it. This point was put in a decidedly novel way. He said: "When our public schools came into being they were not meant for girls, the education of women being regarded as of little consequence. The schools were then properly, necessarily, under the charge of men. Now that women are men's peers, and more, as to culture, and receive this culture chiefly at the public charge, there remains no reason why they should not render to the public the reciprocal service of control, care, and government in the educational system of which they have become the most favored beneficiaries."

Chinese immigration was discussed in a long paper by Professor S. Wells Williams, of Yale, who advocated the admission of the Chinese to citizenship when they desire it. He claimed that the Chinese here are under the strongest national sanction of any race, and ought to be protected. They came here at the invitation of our own people, and brought with them industrious and quiet habits, and have added largely to the resources and wealth of this country.

George T. Angell, of Boston, President of the Massachusetts Society for the Prevention of Cruelty to Animals, presented the results of his investigations into the manufacture and sale of poisonous and dangerously adulterated articles. At the close of the paper, Mr. Henry C. Meyer, of this city, said that he had investigated Mr. Angell's previous statements in regard to adulterations, and had tests made, and could discover no such general system of adulteration as Mr. Angell reported.

In the evening the President of the Association, Professor Gilman, of the Johns Hopkins University, Baltimore, delivered the annual address. His subject was "American Education during the last Decade." He took the ground that the American public school system never stood so firm, or worked so well, as now. The most noteworthy administrative change of the decade has been the admission of women to the local school boards of Massachusetts, and the opportunity afforded them in the same State to vote for school officers. The most noteworthy pedagogical movement has been in the introduction of kindergartens, and in the attention bestowed upon drawing and vocal music.

The subjects considered September 11 covered a wide range, embracing questions of public health, law, the protection of workmen in mills, the treatment of criminals, and the like. Resolutions were adopted favoring the metric system and a system of international coinage based on the unit proposed by President Barnard—the gramme weight of gold nine tenths fine. The sewerage of village cities was presented by Colonel George E. Waring, Jr., and discussed by several members. It was also commented on at considerable length by Professor Acland, of the University of Oxford, England. The history of the tenement house system of New York was presented in a paper on the sanitary condition of tenement houses, by Dr. Charles P. Russell, of this city.

Professor William Watson, of Boston, read a report on the "Protection of Life from Casualties in the Use of Machinery," in which he reviewed what has been done in this country and abroad toward the prevention of such accidents, and described various devices for covering dangerous machinery.

President Anderson, of Rochester, discussed the relations of Christianity and the common law; Dr. Wharton, of Cambridge, the various theories of punishment for crime; Frederick H. Betts, of New York, the policy of the patent laws; and Professor Woolsey, of New Haven, read a paper on the United States and the Declaration of Paris in 1856. All the principles of the Declaration of Paris were declared to be in accord with the spirit and policy of our government.

RECENT INVESTIGATION INTO THE ACTION OF ANÆSTHETICS.

The third report on the action of anæsthetics to the Scientific Grants Committee of the British Medical Association has been made recently, the report embracing the results of investigating the condition of the blood pressure in animals under the influence of chloroform, ethidine, and ether. The experiments were made upon rabbits and dogs, and seem to have been performed with great care. The facts obtained from the observations, says the *Medical Record*, warranted the committee in reaching the following conclusions: Ether, when administered to animals, has no appreciable effect in reducing blood pressure; chloroform and ethidine have a decided effect in that direction.

Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action. The occurrence of these sudden and unlooked for effects are a source of serious danger, because the blood pressure is with great rapidity reduced to almost zero, while the pulsations are greatly retarded or even stopped.

By ethidine the reduction of blood pressure is not, so far as has been observed, through sudden and unexpected depressions. Chloroform may cause death by primarily paralyzing either the heart or the respiration. Although not free from danger on the side of the heart and the respiration, ethidine is, in a very high degree, safer than chloroform, inasmuch as the former does not compromise the heart as does the latter.

A legitimate deduction from the facts given is that ether is by far the safest of the three anæsthetics used, and that ethidine is much safer than chloroform, and equally efficient.

A Notable Feature in the Iron Trade.

Some of the features of the present advance in iron, remarks the *Iron Age*, are worthy of note. It will be found upon inquiry, that in the case of most mills the increase in the volume of business has not come from gaining new customers, but from increase in the orders of the old. There may be some exceptions to this statement, but it will hold true generally. This indicates that there has been a decided increase in consumptive demand, and that both consumers and jobbers believe that this is a good time to stock up and to place orders for future consumption. Another feature of interest is that the increase has come without much drumming for trade; that is, the buyers have sought the sellers—a most healthy indication. It will be further found that, so far as price is concerned, the sellers are more conservative than the buyers. This is a somewhat paradoxical statement, but manufacturers are holding back, and are more fearful of the effect of a too rapid advance than the consumers. The true secret of many of the advances that have taken place during the past six weeks, will be found in the offers that buyers have made for iron for immediate delivery. We have mentioned a case where 2:20 cents was offered when 2 cents was the usual selling price, for a lot of iron that was needed in ten days.

Glass Shoe Patterns.

The question sometimes arises whether a patent can be obtained for the mere substitution of a special material for another in the manufacture of a well known article. In reply, we may state that if the Patent Office is satisfied that in consequence of the substitution a new and important result is obtained, a patent will be allowed. A recent case in point is that of an applicant who asked for a patent for making shoe patterns of glass. It was alleged against the applicant that glass patterns had been previously used for cutting out photo print ovals; also that sheet metal shoe patterns were in common use; and that there could be no invention in merely substituting therefor such a well known substance as sheet glass. But the Commissioner decided that the use of glass shoe patterns was a useful novelty, sufficient to support a patent, because such patterns enabled the cutter to see any defects in the leather and move the pattern to avoid them, which he could not do with the ordinary patterns. So the patent for glass shoe patterns was allowed.

The Devil's Darning Needle.

To the Editor of the Scientific American:

Though I regret being compelled to even appear to take issue with the eminent entomologist of Washington, I must beg to assert that my statement in your issue of August 16, in regard to the finding of a thick-thighed walking-stick in early spring, and in a pool of water, is not "founded on mistaken identity." I have been perfectly familiar not only with these insects, but also with the water-boatmen referred to by Professor Riley, for several years, and certainly would not confound them even at a casual glance; and I noticed one or two characters of the walking-stick quite particularly. I observed that the alternate brown and greenish transverse bands marking the femora were unusually distinct, probably on account of being wetted; and as it occurred to me at the moment that the females might occasionally survive and deposit ova in spring, I examined it to ascertain the sex, and found the curved clasping organs of the male insect at the extremity of the abdomen.

It should not be inferred from my statement of the size of very young individuals that the adults are so diminutive, nor from the finding of this specimen in the water that the species is properly aquatic. The specimen was perhaps three inches long, exclusive of the antennæ, and is the only one I have ever seen in, or even near, water. I simply placed the matter on record in the columns of your paper as being wholly anomalous, and, to me, utterly inexplicable.

Yours truly, W. J. MCGEE.

Farley, Iowa, Sept. 4, 1879.

The Catskill Mountains.

Professor Guyot has published a new map of the Catskill Mountains, the result of several summers' work in the Catskill region with his barometer and surveying instruments. He has measured the height of over two hundred places, determined by triangulation the positions of all the many summits, and discovered mountains that were not known to exist. A large part of the region, especially the southwestern, is an untracked wilderness of forests; and in several cases the only chance for making his triangulation was by climbing to the tops of the highest trees. He has found higher points than were before recorded, and many of them. His table of altitudes contains three peaks over 4,000 feet, thirteen over 3,800 feet, and thirty-six over 3,500 feet. The highest point is one of the previously unknown, Slide Mountain, in the Southern Catskills; its height is 4,205 feet above tide.

NEW FORM OF REYNIER'S ELECTRIC LAMP.

In 1878 Mr. E. Reynier observed the advantages presented by the effects of incandescence for the simple production and division of the electric light, and conceived the idea of uniting these effects with those of the voltaic arc. He therefore arranged the carbons, according to the Lodyguine system, so that it would burn at the point and furnish a small center of combustion at the point of contact. A small voltaic arc was thus produced.

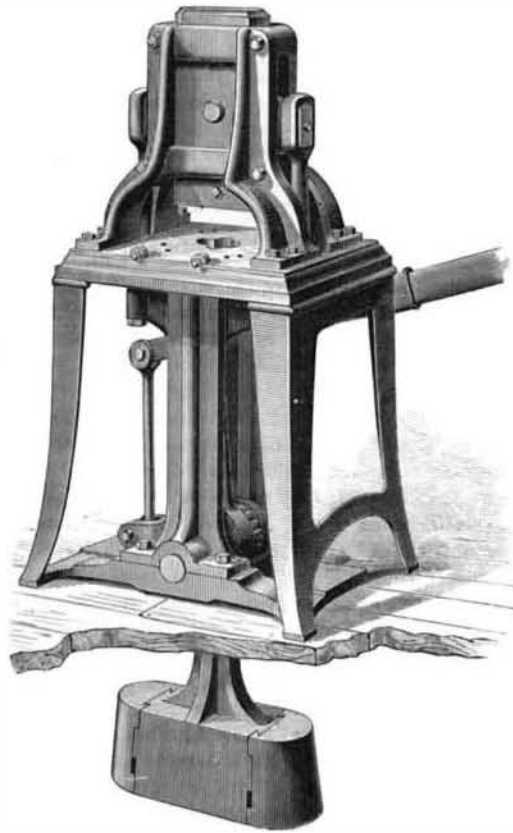
In this lamp a slender rod of carbon is placed above a fixed and massive contact, either of carbon or metal, and is held in a vertical position by a heavy carbon holder. The carbon holder, by means of its weight, gradually pushes the carbon rod downward to replace the parts burned away. Cinders will collect at the point of contact if the ordinary carbons are used, but these cinders are thrown off by the rotation of the carbon disk. With this apparatus Mr. Reynier illuminated five lamps with a current from thirty Bunsen elements, and maintained the light in one of the lamps for more than a quarter of an hour with a secondary battery of three Planté elements.

Fig. 1 is a side view of the lamp without globe. Fig. 2 is a front elevation with section of globe and support. Fig. 3 is an elevation of the other side. A is the hollow supporting column with base; B is a slender carbon rod fitted to the socket, C, and retained by a screw. The vertical rod, D, supports the carbon rod, B, and slides in the column, A, on friction rollers. The carbon disk or cylinder, E, upon which the end of the carbon, B, rests, is supported in a forked arm, F. The carbon slides between the two cheeks of the curved guide, G. There is a small wheel, H, at the end of the guide, G, against which the carbon rod, B, rests, and an inclined lever, I, is pressed by the spring, J, against the carbon rod, and acts as a brake. A glass globe, K, covers the whole.

Mr. Reynier has made several models of his lamps. The last has a Carré carbon about 0.08 of an inch in diameter, held by a heavy carbon holder, which slides in a hollow column, and is provided with four friction rollers. The carbon rod rests on a carbon cylinder pivoted to a vertical arm of the column. A guide piece, provided with a brake, holds the carbon rod, and through this guide the current passes into the carbon rod, and from thence to the carbon cylinder, and returns to the battery. The point of contact is not directly over the center of the cylinder, but a little to one side, so that the cinders cannot accumulate.

A NEW COMBINED PUNCH AND SHEAR.

In our last two issues we gave brief descriptions of the new patent "Peerless" punching and shearing pendulum presses, Nos. 1 and 2, designed for comparatively light work. The one shown in the accompanying engraving is adapted to heavy work, and differs from the others in construction but not in principle. In the two presses previously described, the pendulum swings above the floor, and is actuated by treadle or hand lever. In this press the hand lever alone is used. It is designed for work as heavy as is usually done by large

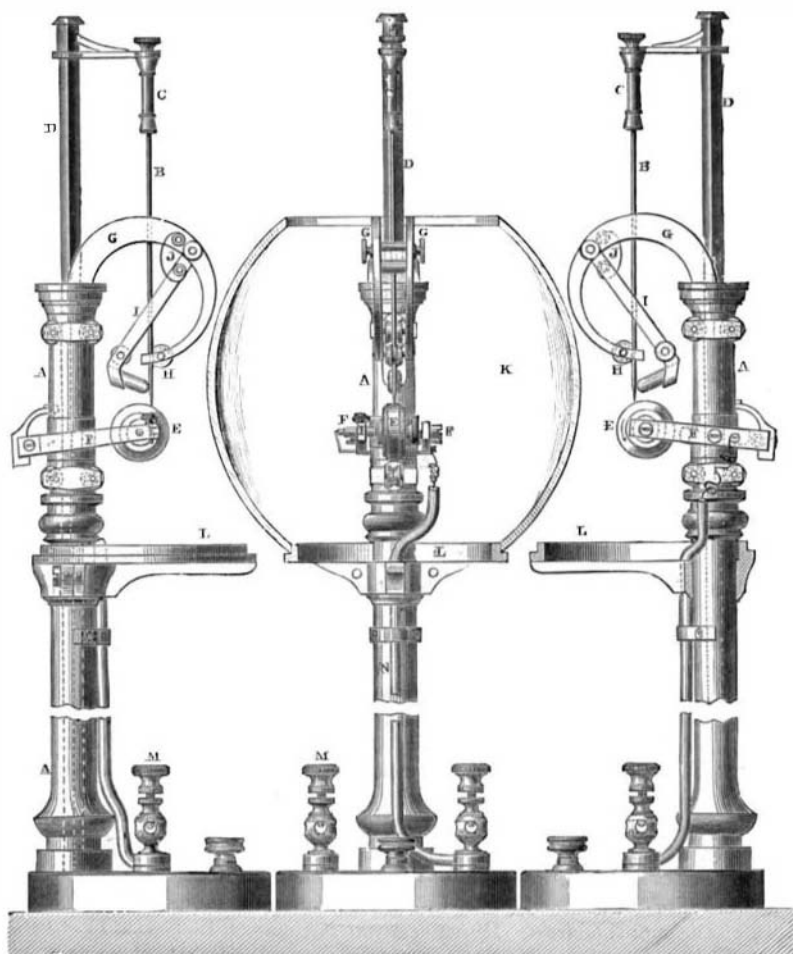


"PEERLESS" COMBINED PUNCH AND SHEAR No. 6.

power presses, and is intended for railing makers, machinists, bridge builders, ship joiners, railroad contractors, and heavy iron working generally.

The work accomplished by it is astonishing, and we do not know of a hand press in the market performing as heavy work as this with but one man at the lever.

The pendulum swings below the floor, and is longer and heavier than in the presses before described. With one man at the handle, it punches easily an inch hole in three eighths bar iron, and $\frac{5}{8} \times \frac{1}{2}$, any distance from the edge; and shears



REYNIER'S ELECTRIC LAMP.

$\frac{3}{4}$ bar, $2\frac{1}{2}$ inches at a cut. It has an open back, and will admit a plate 14 inches wide, and of course any length. The opening in the bed is 7x9 inches; stroke of slide $1\frac{1}{2}$ inch; adjustment of slide $1\frac{1}{2}$ inch. It weighs about 1,200 lbs., and

occupies but one foot seven inches by two feet four inches of floor space.

The cross heads and connecting rods are made of steel, and the press is apparently very strong and substantially finished. We are informed that the manufacturers intend to exhibit the machines we have illustrated, in operation, every evening at the approaching exhibition of the American Institute in this city. The novelty of these presses will, doubtless, excite the curiosity of all practical machinists.

For further information, address the Peerless Punch and Shear Company, 52 Dey street, New York city.

A Strange Collision at Sea.

The Rotterdam steamship P. Caland, which arrived at this port September 9, brought the captain and crew of a Norwegian bark which had been sunk by collision with some sea monster in mid ocean. The bark Columbia left London for Quebec, in ballast, August 8, and met with variable weather until the morning of the 4th inst., when she was sailing at the rate of from six to seven miles an hour before a fair wind. The sea was not very rough, and the bark was carrying all sail and heading westward. The captain was on deck at five bells in the morning watch, when a tremendous shock, which shook the bark from stem to stern, was suddenly felt. The men who were asleep in their bunks were awakened, and thinking that the foremast had been carried away, sprang on deck. Capt. Larsen and three of his men ran to the port side and saw the water discolored with blood, while the tail and fins of a huge monster were seen splashing about in the sea, which had become violently agitated on that side of the vessel. At this moment one of the crew cried out that a leak had been sprung, and Capt. Larsen and the carpenter hurried down into the hold to see if the bark had suffered any injuries. In the port bow, about three feet below water mark, they found that four planks had been crushed in for a space about four feet long. A large hole had been made, through which the daylight above the water could be plainly seen. The water was pouring into the vessel through this hole. Several attempts were made to stop it up, but failing, the bark was abandoned and sank soon after. The captain and his crew of twelve men were fortunately picked up by the P. Caland the same day in the afternoon. No precise description of the colliding monster could be given. The Columbia was an old ship, but about two years ago was put on the stocks and thoroughly replanked. Her bow was made of solid $4\frac{1}{2}$ -inch oak planking.

MECHANICAL INVENTIONS.

Mr. John J. Kendall, of Greensborough, N. C., has patented a shingle machine, which is an improvement upon the shingle machine for which letters patent of the United States No. 166,784 were granted to the same inventor, August 17, 1875. The improvement cannot be clearly described without an engraving.

Mr. John F. Rakes, of Greenup County, Ky., has patented improvements in automatic car couplings, the object of which is to furnish means for holding the link and pin in position to immediately and surely engage each other when the cars are moved up in position to be coupled.

An improved car coupling has been patented by Mr. Colin Chisholm, of Los Angeles, Cal. This is an improvement in the class of car couplings in which the pin is so pivoted as to form a gravitating latch, which is thrust back by the disk when it enters the draw head, but immediately falls into the slot of the link, and thus completes the coupling. For uncoupling, the latch is raised by a chain and lever.

An improved device for locking the adjacent ends of railroad rails securely in place, so that they cannot rise out of line with each other under the pressure of passing trains, has been patented by Mr. Elijah F. Locke, of Apponang, R. I.

An improved ice boom has been patented by Mr. John B. Hansler, of Jersey City, N. J. It is designed for keeping cut or broken drift ice from floating farther up and down stream than is desired, and also to prevent ice from descending the rivers and entering the harbors. It consists of an arrangement of net work of iron rods and cables connected to floats, and joined to the shores, piers, or docks on either side, and arranged to swing open for the passage of vessels, and possessing sufficient elasticity to yield to the force of the current and tides, and to the impact of the floating ice, without breaking.

An improvement in wagon jacks for raising the axles to take off the wheels for greasing the spindles, has been patented by Mr. Andrew McClure Jones, of Birmingham, Ala. It consists of two bars, one serving as a standard and the other as a movable extension, to the upper end of which the lifting lever is fulcrumed. The adjoining faces of the bars are ratcheted, so as to engage each

other, and connected together by bolts projecting from one bar through a vertical slot in the other, and furnished with thumb nuts, by which the upper bar can be secured at any desired height.