Correspondence.

Goats to Protect Sheep.

To the Editor of the Scientific American:

Page 16 of your issue of January 14 contains an extract from the New York *Sun*, advising the public that the farmers of portions of New Jersey protect their sheep with goats. It is to be hoped, for the sheep's sake, that no farmers outside of New Jersey will ever follow their example. I once owned a beautiful Angora buck and ewe, and as he was the "best man" in the neighborhood, I trained the pair to range with my sheep for the latter's protection. This buck could jump any fence in the county, and could climb any tree growing in the corner of a rail fence by first getting on the fence and then into the tree. In quite a short time every wether I had was as good a jumper as the Angora buck, and had I not converted them into mutton I would have had a valuable flock of sheep ruined. Kill the dogs, but keep the sheep and goats separate here as well as hereafter.

D. W. A.

Washington, D. C., January, 1882.

The Question to Mr. Lawson Answered.

To the Editor of the Scientific American

In No. 1, vol. xlvi., SCIENTIFIC AMERICAN, your correspondent, E. H. Rood, states that a locomotive, usually carrying 80 to 100 pounds steam, "was going through the woods on a roadway built for logging purposes, and ran under a leaning tree which had fallen since the last trip before made, and the smokestack, safety valve, etc, were knocked clean off. The water spouted forty feet in the air, and the boiler was emptied in short order, but there was no explosion. Now, if the water explosion theory is correct, why was not there an explosion in this case?"

The danger of explosion does not arise from suddenly opening the valve, but from the *instant check to the bursting water by quickly closing it.* In this case the valve was opened without any danger of closing by a slight relief of pressure. It was opened "to stay." If Mr. Rood will carefully read the account of my experimental explosion as published in No. 313, SCIENTIFIC AMERICAN SUPPLEMENT, he will see what is claimed by what he terms the "water explosion" theory.

D. T. LAWSON.

Wellsville, O., 1882.

Attention, Inventors.

To the Editor of the Scientific American:

I beg leave through your columns to call the attention of inventors to a much-needed machine. It is well known that the settlers on the great Western prairies suffer great inconvenience on account of the scarcity of fuel, and yet have all the elements of an excellent fuel in the immense quantity of prairie grass about them on every hand. A simple machine that will spin prairie hay into hard solid knots or rolls of suitable size for fuel would certainly meet with a great demand. Prairie hay is now largely used for fuel by being twisted into knots by hand. This is slow work, besides it can be done much better by means of, say, a small foot-power machine. Inventors, try your hands.

C. F. H.

A Miner's Ingenuity.

James McGlynn, a miner in the Hallenback Colliery, at Wilkesbarre, Pa., has found recreation and amusement during the spare time of the past nine years in the construction of an elaborate clock. As described by a reporter of the New York *Times*, the clock stands about nine feet high, and is incased in an elaborately carved case of black walnut, consisting of 406 pieces of perfect finish. Each of these pieces was turned in the mine by the enthusiastic miner with a tool that would make a cabinet-maker smile, being nothing less than a broken saw file.

In addition to the 400 turned pieces in black walnut, which comprise the framework of the clock, it has 63 moving figures, actuated by machinery, so deftly arranged as to produce interesting historical and biblical scenes. It is the intention of the miner-mechanic to make the number of figures a hundred as soon as his means, which are rather limited, shall afford such an additional outlay.

The front of the clock shows three balconies, rising above a massive and elegantly carved pedestal, and upon these the moving figures appear. The lower balcony shows a procession of Continental soldiers, headed by a mounted general and marching past, while the old Liberty Bell proclaims its welcome notes of freedom. A sentinel salutes the Continentals as they pass, and just at the moment a door is opened from an upper balcony and reveals Molly Pitcher, with her cannon, which she fires with startling and realistic effect. To show how well the maker of the clock has considered the details of his handiwork, he has placed a small revolving fan in the clock, to be actuated after the firing of Molly's cannon, for the purpose of clearing out the powder smoke. Simultaneous with this the portraits of the twenty Presidents of the United States pass in panoramic view on a balcony just above the patriotic tableau, of which Molly Pitcher is the central figure, and Thomas Jefferson holds up the Declaration of Independence. The apostolic procession is similar to those hitherto seen in such clocks. The Twelve Apostles file past, Satan appears, and the cock crows in warning to Peter. A figure of justice raises her scales as the form of Christ appears, and during the scene a large representation of Death tells off the minutes upon a bell. When one sees the clock, the tools with which it was made, and hears the miner's story of how he bought the wood for it bit by bit as he could afford from his spare change, he is sensibly impressed with human possibilities. The figures used in the biblical and historical illustrations were cast by McGlynn in moulds of his own design, and there is very little in the entire clock that did not come from his hands. Now that it is finished he scarcely knows what to do with it.

Vegetation in Arctic Siberia.

Baron Nordenskjöld, in his account of the voyage of the Vega, gives glimpses of the vegetation found at the extreme north of the Asiatic continent. At the mouth of the Yenisei, for instance, as on all other Siberian rivers running from south to north, the western strand, wherever it is formed of loose, earthy layers, is also quite low and often marshy, while, on the other hand, the eastern strand consists of a steep bank, ten or twenty meters high, which north of the limit of trees is distributed in a remarkable way into pyramidal-pointed mounds. On the slopes of this steep bank and in several of the *tundra* valleys there is an exceedingly rich vegetation, which 100 kilometers south of Yefremo-Kamen forms actual thickets of flowering plants, while the *tundra* itself is overgrown with a scanty carpet, consisting more of mosses than of grasses. Willows of little height go as far north as Port Dickson (73° 30′ N.L.), the dwarf birch (*Betula nana*, L.) is met with, though only as a bush creeping along the ground, at Cape Schaitanskoj (72° 8′ N.L.); and in 1875, on the ice mixed soil of the *tundra*, ripe cloudberries were gathered. Very luxuriant alders (*Alnaster fruticosus*, Ledeb.) occur already at Mesenkin (71° 28′ N.L.), and the Briochov Islands (70° to 71° N.L.) are in several places covered with rich and luxuriant thickets of bushes.

But the limit of trees proper is considered to begin first at the great bend which the river makes in 69° 40′ N.L., a little north of Dudino. Here the hills are covered with a sort of wood consisting of half-withered, gray, moss-grown larches (*Larix sibirica*), which seldom reach a height of more than seven to ten meters, and which much less deserve the name of trees than the luxuriant alder bushes which grow nearly 2° further north. But some few miles south of this place, and still far north of the Arctic circle, the pine forest becomes tall. Here begins a veritable forest, the greatest the earth has to show, extending with little interruption from the Ural to the neighborhood of the Sea of Ochotsk, and from the fifty-eighth or fifty-ninth degree of latitude to far north of the Arctic circle, that is to say, about one thousand kilometers from north to south, and perhaps four times as much from east to west. It is a primeval forest of enormous extent, nearly untouched by the ax of the cultivator, but at many places devastated by extensive forest fires.

On the high eastern bank of the Yenisei the forest begins immediately at the river bank. It consists principally of pines; the cembra pine (*Pinus cembra*, L.), valued for its seeds, enormous larches, the nearly awl-formed Siberian pine (*Pinus sibirica*, Ledeb.), the fir (*Pinus obovata*, Turcz.), and scattered trees of the common pine (*Pinus sylvestris*, L.). Most of these already north of the Arctic circle reach a colossal size, but in such a case are often here, far from all forestry, gray and half dried up with age. Between the trees the ground is covered with a labyrinth of fallen branches and stems. Nearly everywhere the fallen stems are covered, often concealed, by a luxuriant bed of mosses, while tree lichens, probably in consequence of the dry inland climate of Siberia, occur sparingly. The pines, therefore, want the shaggy covering common in Sweden, and the bark of the birches which are seen here and there among the pines is distinguished by an uncommon blinding whiteness.

Cement-Beton and Artificial Stone.

At an assembly of German cement makers, Von Froideville made a report, which was published in the *Thonindustrie Zeitung*, in which he said:

A good cement does not crack, and even in a northern climate is able to resist the weather, supposing it has been properly mixed. If too much water has been used, so that a glassy crust forms on the surface, and the whole mass is not homogeneous, the cement checks or cracks, and as soon as hair cracks appear moisture enters and the frost completely destroys it. A second fault is when the cement strikes out, which it ought not to do. Cement can be colored nicely and permanently with suitable colors, but quite a good deal of color is necessary if it is required to entirely hide the natural color of the cement and give it the exact color desired. The addition of a coloring to cement makes it more friable and softer, so that it takes comparatively more cement than without the color. Cement is only just coming to be understood in practice, but, on the other hand, architects are too distrustful of artificial stone.

For several years artificial stone for curbstones and street gutters have been made at Potsdam, and have lasted well. The gutter stones are very cleanly and neat, and the fear that frost and the pressure of the earth on both sides would destroy them have proven unfounded.

Granite, when broken up fine, imparts to cement a very considerable strength similar to gravel, but the pieces of stone being heavier settle and interfere with its manufacture. On the other hand, the addition of granite to cement without any sand makes an excellent material. In the gymnasium at Potsdam are two pillars made in this way, which support not only a cross-vaulted arch, but also bear the pillars that extend to the upper story.

When marble is combined with cement without the addition of any sand, blocks are obtained of such strength that they are capable of receiving a fine polish, but cement must first assume the strength of stone. The problem was presented of building a stairs with steps 40 inches long, set into the masonry 8 inches at one end, each step having a height of 6½ inches, and a total width of 14½ inches. Experimental blocks were prepared, and at the end of six weeks four steps were put up for trial. Railroad iron was piled up on the steps, and the weight gradually increased until it reached 5,940 pounds. The steps held out, but no more could be put on because the masonry began to yield. The load was left on the steps for three days and nights without any injury. The steps subsequently remained unaffected. By adding pieces of marble to the cement different kinds of stone were imitated, with a saving of expense equal to nearly one-half the cost of real granite work.

A considerable quantity of cement is used for the flooring of terrace work. The manufacture of old Roman marble mosaics for parquettes and floors has rested many centuries, and has only recently been revived. The Italians make a ground bed or beton strata from puzzolana, or hydraulic lime, and pieces of brick, and lay the mass also in brick dust. Portland cement answers much better than these for joining the pieces of marble and such like, and can also be employed for mosaic plates and tiles.

Cement-beton—coarse gravel with cement below, fine sand with cement on top—is a pleasant and durable material used more and more every year for sidewalks and such like purposes. But many other things have been made of it—building objects, floor and cellar coverings, vaults, cattle cribs, stables, and even whole houses, as well as a series of bridges, that are both good and cheap.

At the meeting referred to, where this report was made, one firm in Amœneburg, near Bilbrich, exhibited photographs of a bridge which they had made for the Dusseldorf exhibition, while a Frankfort firm showed the plans and pictures of another beton bridge, also at Dusseldorf. It was planned by Loehr, and the arch had a breadth of 73 feet and a spring of only 71 inches. The thickness of the arch at the counterfort was 14 inches, and 18 inches at the top. The arch was constructed after the counterfort was done, April 14, 1881, by four cement workers and twenty hod carriers and helpers in *eight hours.* It was tested May 25 by a one-sided load on half the arch of 400 kilos per square meter, or about 80 pounds per square foot, without injury. It was then thrown open to the public, and was in use during the whole time of the exhibition.

Another firm had erected two large two-story farmhouses in Lauenburg, each 166 feet long and 76 feet wide, with an average height of 25 feet, all of beton. The walls were 8 inches thick on the first floor, strengthened every 10 or 15 feet with an extra thickness of 4 inches more, while the second floor had walls of only about 7 inches in thickness. The mixture employed consisted of 1 part of cement, 2 parts of sand, and 6 parts of gravel. The work occupied two months.

Buildings of a similar sort have been in use for some time in our own country, but have not met with much favor as a rule, notwithstanding their cheapness. Perhaps improved materials and more care in mixing, as well as in construction, may raise beton to the dignity of brick in sections where large stones are scarce. The latter condition is wanting hereabouts.

Comedones.

The black points, fleshworms, or comedones, which are found in the face, and especially near the nostrils, are not at all produced by the accumulation of the particles of dirt or dust, as has generally been believed, but by pigmentary matter which is soluble in acids. It is known, in fact, that black comedones which accompany acne often appear not only on persons exposed to dust or rather careless of their person, but also on chlorotic young girls who live in good circumstances. Besides, observation shows that the discoloration not only exists on the surface of old comedones, but descends always to the lower parts. Accepting this fact, Unna has used successfully acids in the treatment of comedones. He generally prescribes: Kaolin, 4 parts; glycerine, 3 parts; acetic acid, 2 parts, with or with the addition of a small quantity of some ethereal oil. With this pomade he covers the parts affected in the evening, and if need be during the day, After several days all the comedones can be easily expressed, most of them even come out by washing the parts with pumicestone soap. The same results can be obtained by bandaging the parts affected for a long time with vinegar, lemon juice, or diluted hydrochloric acid.

The author concludes by saying that the acids act like cosmetics, as they transform the black color into a brown and yellow shade and destroy it gradually altogether; they produce a quicker desquamation of the horny bed which interrupts the exit of the comedones and brings to the surface the glandular openings.—*Archives de Virchow.*

Photography of Gas Flames.

Gas fitters have recently made a most useful application of photography. They photograph the gas flames given by different burners or jets, so that a customer can see if the shape and form of a light will suit him before he gives his order. As the flames are, moreover, depicted "life-size," the purchaser can always tell whether his jet is up to the standard.

The Sawmill Changes of a Century.

Among the most marvelous of the many wonderful things which distinguish the United States from other nations, are the results which have grown out of the possessions of immense forests of valuable timber, in stimulating inventive genius to the preparation of an article of building material so cheap as to enable the poorest to have a comfortable home, while at the same time so excellent in character as to be not only suited, but indispensable, to the working classes. Those more readily accessible regions of the continent which possessed these forest growths in the greatest abundance were among the first to receive large accessions to their population, drawn together at those centers which presented the easiest access to cheap building material, not less than for their personal safety from a savage foe. It was not until the demand for lumber far exceeded the ability of the "greatest" mills of half a century ago to supply, leading the manufacturers to feel the need of a more extended system of production, that the star of empire made any progress westward, or it became a possibility to settle upon the prairies of the West, or to develop the mineral resources which have already shown our nation to be the peer of, if it does not excel, all others in the extent of its possessions. To possess is to need. And the cheap building material which the cheap mills of the days long gone by enabled a scanty population to utilize, stimulated a more extended immigration, with its increased needs, as well as a higher order of inventive genius to increase the supply.

The mills of the olden time were, first, the windmill, with its uncertain power, scarce exceeding that of the men who ran the pit saws which were then in a measure superseded, and whose indignation at the effort to lessen their manual labor caused them to mob the owner and tear down his machinery. Second, the adaptation of a current water-wheel of scarcely greater power, if more reliable, run by the natural current of a small stream. Next came the simple flutter-wheel, to impart motion to which required the building of dams to hold large bodies of water, which should at all times be available. But for large operations the flutter-wheel was found to possess too little power, and the overshot or undershot wheel became a necessity, to be superseded later by the adaptation of turbine-wheels, now so much in favor with mill owners who control water power. For the first fifty years of our national growth, as well as during the preceding portion of the world's history, none of the mills were equipped with anything more than a single upright saw working in a gate, and when another saw was added, as the inceptive idea of the gang, which quickly succeeded with its large number of saws, words could scarcely express the astonishment of all who saw the working of the bold innovation.

Up to this time, all the lumber which was manufactured had been edged upon the top of the log after it was turned down; an auxiliary saw was not thought of, for the buzz saw, just beginning to be used, was considered a most dangerous piece of machinery. But the increased manufacture growing out of an increase in the power and an increase in the number of saws, led to the introduction of the small circular or "buzz" saw, which was at once found to nearly double the capacity of the mill. It is needless for us to enlarge upon the introduction of steam power in the sawmill, or to follow the original idea of an engine, 6 x 8 inches, attached to the lower end of the pitman or saw gate, through its successive stages of development and enlargement to the present time, when the Corliss, or Estes, or other well-known engines, of a power from ten to one hundred times greater capacity than was the original device, are by the thousand in number engaged in turning out lumber, each in one season aggregating a greater manufacture than were all the sawmills of the country combined at a period scarcely fifty years in the past.

The old gate saw was superseded by the mulay, with a reduction of friction equal to thirty or fifty per cent increase in cutting capacity. The mulay gave way to the circular, and with its introduction may be dated the commencement of an era which has been prolific of innovation, improvement, and advantage to the sawmill world. As the use of the circular became better understood, and men became expert in so dressing it as to make true lines and smooth surfaces, they found themselves able to produce more lumber in the rough than they could properly edge and prepare for market. The old edging-table could not keep up with the cut of the saw. This was remedied by the introduction of gang edgers, which no mill doing any considerable business could now dispense with. Now the work of the main saw could be safely increased, for the gang—or, as it was at first known, "double"—edger was abundantly able to keep pace with it, and while at first a capacity equal to 1,000 feet per hour was doubtfully claimed, later developments have shown in not a few instances an entire season's work at the rate of 6,000 feet per hour.

This increase in capacity called for a more speedy method of handling the logs on the carriage, and the lumber as it left the saw, and a multitude of inventive minds were concentrated on mill dogs, which should successfully take the place of the lever and pike, driven by a mallet, and the modern sawmill could not now be operated with the original method of dogging the log. The "nigger," for turning the log on the carriage, as well as rolling it on the skids, has superseded the cant-hook and muscular power formerly relied upon, while the lumber, as it leaves the saw, drops upon a system of live rollers, which does the work to much better advantage than it was formerly accomplished by a hard worked "off-bearer," who could not in these days by any possibility keep up with the work which would crowd upon him.

Plenty of lumber, cheaply manufactured and sold at reasonable prices, has enabled the settling up of a nation at the rate of nearly fifty per cent increase of population during each decade. This in turn has demanded a network of railroads, and carriage by them has not as yet been reduced to a science, which enables us to believe that rates have reached a minimum which they will realize in the future. The manufacturer of lumber, bearing this in mind, must reduce the weight of his product to the lowest possible point, and the trimmer became a prime necessity as an economizer, not less than for an advantage in an æsthetic point of view. And the old gang mill, from its original adaptation of two saws, hung in a cumbrous frame, upon monstrous posts which headed in a weigh beam, made from the largest stick of timber which the forests afforded, and footed in the mill foundations, shaking the structure and the surrounding country, and keeping the machinery about one-half the time in the repair shop from its everlasting jar, has been displaced by the neat, effective, and comparatively noiseless devices of more modern times, developing a sawing capacity of which the fondest anticipation of the original inventor of the idea had not the remotest conception. The heavy weigh-beams have disappeared, the monstrous wooden posts have given way to equally advantageous and strong but less cumbersome and more sightly iron supports, resting upon foundations independent of those which support the mill frame. The old, stiff, and full-of-friction gate has been superseded by oscillating slides, giving to the saws the same motion which the pit sawyer seeks to obtain in order to accomplish the most work with the least outlay of strength.

Time would fail us to trace out all the changes which a quarter of a century has developed in the sawmill. Should a Rip Van Winkle of the last century be suddenly awakened from his long sleep, still dreaming of the last act of dogging the log on his old-fashioned carriage, in the old mill, when he took long naps between the cuts, and esteemed a production of 1,000 feet per day something to brag of, and open his eyes on the floor of a modern mill of the smallest size, he would truly think that the world had turned upside down, and if he saw the army of men carrying off a quarter of a million feet of boards per day from the saws of some of the larger mills, he would not believe the evidence of his senses. All has changed; the water-wheel has given place to the steam engine; the single small cylinder boiler, to the monstrous tubular or flue in large batteries; the upright saws in a gate, to the mulay and the circular; the two-saw gang, to a forty-saw; the rag-wheel, to the steam feed, adding countless possibilities to the ability of the circular saw to cut up logs; the single buzz saw, to the double edger; the rough end lumber, to the well trimmed; the vast piles of worthless slabs, to a useful article of lath and pickets; and the final *débris*, in many localities, to usefulness in the manufacture of other commercial articles. The pioneer knew nothing of lath and shingle manufacture; live rolls had not entered his noddle; gang slab cutters would have been by him pronounced an invention of the devil to feed the flames of his insatiable furnace. Endless chains would have had no use in his mill economy; saw sharpeners and gummers would have had no value in his eyes, for he could cut all the lumber he expected to, and find plenty of time for dressing his saws by hand.

The modern sawmill is indeed full of improvements, down to the last device for sorting by machinery. The production in one day, by one saw, of more lumber than was accounted the work of a year in former times, is not only the result of the genius of invention such as marks the spirit of the age, but has rendered possible the remarkable development of the youngest in the sisterhood of nations, forming no unimportant factor in the influence of this country among the people of the earth. All hail to the modern sawmill, and the wise intelligence of nearly every man who is connected with it, either in the production of logs from the forests or the manufacture and sale of lumber, for each progressive step in the march of improvement has reduced the cost of manufacturing lumber, keeping pace with the inevitable increase in the cost of timber, due to the gradual decadence of the forests!—*Northwestern Lumberman.*

Shipping at San Francisco.

A correspondent of the *Tribune*, writing from San Francisco, under date of December 18, says: It is a fine sight to see the wheat fleet lying at anchor here, or taking on cargoes at the wharves. There are ninety vessels now in port. They are the finest specimens of naval architecture afloat, at least among sailing vessels, and are of many different types. The handsomest are undoubtedly the oak ships lately built in New England. These vessels have very tall and slender spars and long yards, graceful hulls, and a style that elicits admiration at sight. No handsomer vessels are ever seen here than such ships as the Samaria, the A. J. Fuller, the Harvey Mills, and their sisters from the down-east yards. The British iron clippers come next. They are very seldom of large size. They average about 1,100 tons register. Along with the great ships in port here there are seen many smaller ones of Pacific coast construction which are as well worth looking at as any. The Pacific coast lumber schooner is the most beautiful craft of its rig in the whole country. The builders have made the evolution of this craft a specialty. They are as a rule keel schooners. The fore foot is cut away under the water like that of a yacht. The fore body is long and sharp, and the after body short and full, but with hollow water lines. The stern is elliptical and broad, and the top-sides fall lower from amidships away off with a grace, seldom, if ever, seen in a schooner on the Atlantic coast, and not often matched in a yacht. These schooners are often loaded down until the water runs over the deck; but whether light or loaded they make remarkably fast trips. With all their speed, they have an astonishing amount of stability, and they cruise along the coast northwards, on the return voyages, for lumber, without a pound of ballast or freight in them, carrying every yard of canvas there is in their outfit. When vessels of this model are put into the wheat trade the famous clipper of the olden times will certainly be surpassed for beauty and possibly for speed. There are eight hundred vessels now owned in the district of San Francisco, and a majority of them are of this class and model.

NEW INVENTIONS.

An improvement in shoes, patented by Mr. Daniel B. Felter, of Newark, N. J., is designed to simplify the construction of single-sole or turn shoes provided with a spring. The invention consists in a single-sole or turn shoe made by sewing the upper to the front part of the sole and to the spring, and then turning the upper and nailing the rear part of the sole to the spring.

An improved invalid bedstead has been patented by Mr. Asahel J. Goodwin, of Brookline, Mass. The improvement relates to the devices used for raising and lowering the hinged sections of invalid bedsteads, and are designed to obtain great power by conveniently operated mechanism. The invention consists in a rack and pinion combined with a cam on which the hinged section is supported; also, in a pawl for retaining the parts in position against downward pressure.

Mr. Martin Hubbell, of Mount Kisco, N. Y., has patented a clevis with a longitudinal groove in the inner edge of its end slot, and with a series of notches, forming teeth, in the opposite edge, this clevis being pivoted in the ordinary manner to a plow beam. The extremity of the latter is provided with a series of vertical grooves. The clevis and the ring are placed in the desired position, and are locked in the same by means of a key fitting in the slot of the clevis.

Mr. George A. Ramseyer. of Dobbs Ferry, N. Y., has patented an improved piano stool. This invention relates to the mode of securing the elevating screw and guide to the seat, and has for its object to obtain a firm and durable connection and a saving in the expense of manufacture.

Mr. Magnus J. Palson, of Elizabeth, N. J., has patented an improved machine for dressing fish—that is, to remove the head, entrails, and backbone—thus preparing the fish for salting and packing it for shipment. The machine is provided with a jointed reciprocating plate, upon which the fish is placed, and is held firmly by spring clamps, which are opened automatically to receive the fish by a beveled fork, a heart plate, and two fixed converging bars, between which the head of the fish is held, so that it can be cut off by an automatically released spring knife, that is drawn upward by a chain attached to a pulley on the main driving shaft of the machine, this shaft being provided with two cranks extending in directly opposite directions, one of these cranks being connected by a suitable connecting rod with the sliding plate for receiving the fish, and the other opposite crank is connected in a like manner with a reciprocating frame sliding above and in opposite direction to the fish holding plate, which upper sliding frame is provided with knives and scoops, that adjust themselves automatically, according to the size of the fish, and rip open its belly, tear out the entrails and backbone, and cut the latter off at half its length, and also tear out the liver and throw it into a chute. The fish is seized by a hook attached to a sliding plate connected with the upper sliding knife frame, and pulled out from between the spring clamps upon an inclined chute, down which it slides.

In the treatment of gold and silver ores containing copper the object is to obtain a matte or regulus which shall contain all the valuable metals. It is, however, found that with the usual methods the slag contains a certain amount of gold and silver, which is lost. To obviate this loss, by insuring a more complete separation of the precious metals, Mr. Richard Pearce, of Denver, Col., has patented a process of smelting ores of gold and silver by precipitating the particles of gold and silver held in suspension after the smelting is completed by throwing upon the slag as soon as the charge is perfectly smelted fine powdered oxide of copper, then closing the furnace a short time before drawing the slag. The effect of this application is that a reaction takes place between the oxide of copper and particles of gold and silver, in whatever combination they may exist, and a rich heavy matte is formed, which descends and carries with it the precious metals.

A novel exhibiting-bracket for stuffed animals has been patented by Mr. James Hobson, of Ann Arbor, Mich. The invention consists of a wire twisted to form a slot, bent upwardly to form a projection, twisted downwardly to form a loop, and having one end passed into a name plate or block.

Mr. Charles E. Trask, of Hastings, Mich., has patented an improved electric clock, wherein the impulse is given alternately by two magnets and the movement controlled by a pendulum. The objects of the invention are to provide for ready and accurate adjustment, to obtain equal tension on the vibrating armatures, to simplify the circuit closing devices, and to obtain the required movement of the impulse lever by a limited movement of the armatures.