Making Artificial Ivory.

The *Chronique Industrielle* gives the following description of a new process for making artificial ivory from the bones of sheep and goats and the waste of white skins, such as kid, deer, etc. The bones are macerated for ten or fifteen hours in a solution of chloride of lime, and afterward washed in clean water and allowed to dry. Then they are put with all the scraps of hide, etc., into a specially constructed boiler, dissolved by steam so as to form a fluid mass, to which is added 2½ per cent of alum.

The foam is skimmed off as it rises, until the mass is clear and transparent. Any convenient coloring material is then added, and while the mass is still warm it is strained through cloth of appropriate coarseness and received in a cooler, and allowed to cool until it has acquired a certain consistency, so that it can be spread out on the canvas without passing through it. It is dried on frames in the air, and forms sheets of convenient thickness. It is then necessary to harden it, which is accomplished by keeping it for eight or ten hours in an alum bath that has been used before.

The quantity of alum necessary for this operation amounts to 50 per cent by weight of the gelatine sheets. When they have acquired sufficient hardness, they are washed in cold water and let dry on frames, as at first.

This material works more easily and take as fine a polish as real ivory.

ZSCHIESCHE'S HYDRAULIC MOTOR.

The utilization of the motive power developed by water courses has given rise to a large number of apparatus, such as turbines, overshot and undershot wheels, etc., that have in recent times reached a high degree of perfection, and leave but little to be desired as regards performance, strength, and ease of keeping in repair.

These apparatus possess but one inconvenience, and that is that they require a fall of water that is not everywhere met with, thus subordinating the selection of the mill site to the configuration of the water course. Mr. Zschiesche's new hydraulic motor, represented in the accompanying cut, requires no fall for operating it, but may be set up at any point whatever along a river that has sufficient velocity. The apparatus undoubtedly offers the inconvenience of being quite cumbersome, and of requiring the use of a motive wheel so much the larger in proportion as the velocity of the current is less, but, as the figure shows, it is mounted very simply upon a float, and can be towed from one point to another of a water course. The system consists of a wooden framework that supports two iron wheels of different diameters. The larger of these wheels is the motive one.

Its axle, which rests in bearings, can be raised or lowered by means of a windlass, and the same is the case with the smaller wheel. It will be seen that it is thus very easy to cause the wheels to plunge sufficiently deep into the current to secure a proper working of the apparatus, whatever be the level of the water.

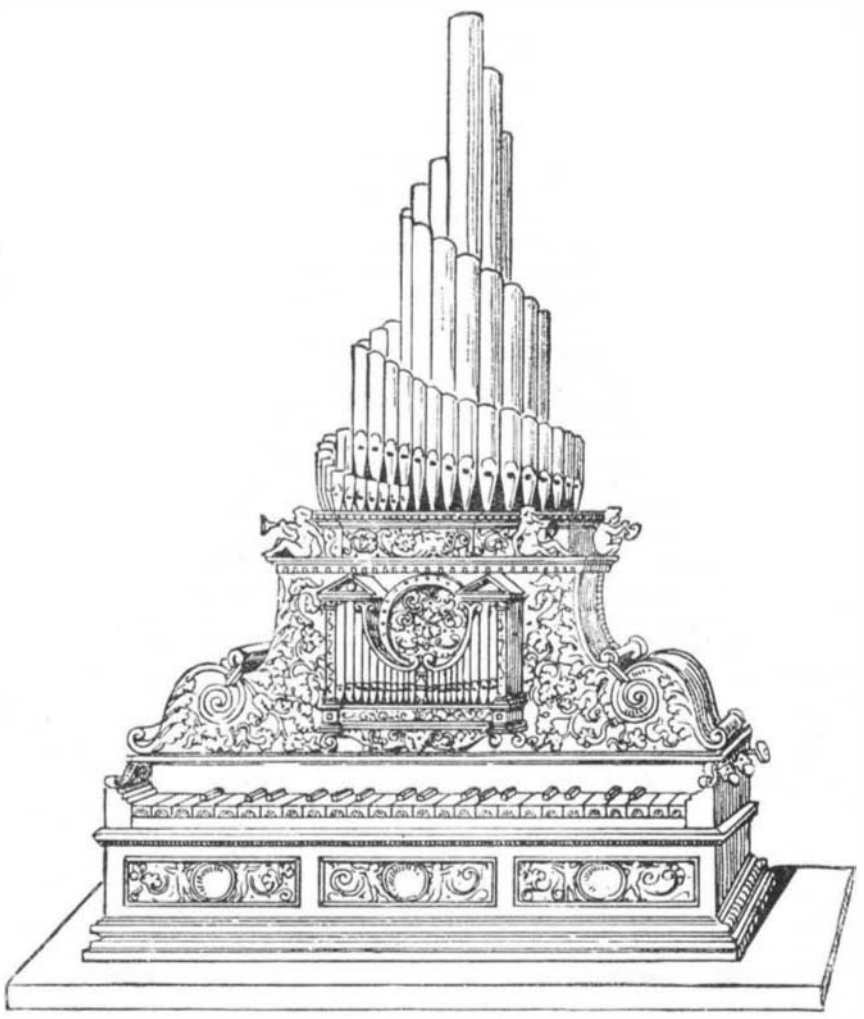
The spokes of the wheels terminate in hooks, which serve to carry the wheels along by means of two endless chains connected by paddles. The latter are each hinged upon an axis mounted upon the chains, and can be inclined at will in such a way that, whatever be the depth that the lower part of the motive wheel reaches, the paddles will always be perpendicular to the level of the water. The paddles are held in place by means of pins that may be transposed upon a quarter circle of iron.

The lower, movable part, which consists of two chains and paddles, dips entirely under water and is carried along by the current, the result being the revolution of the wheels that support the chains. The upper part is sustained by a roller.

The axle of the smaller of the two wheels is provided with a pulley that serves to communicate motion to the machines and apparatus of the building, partially shown in the foreground in our engraving. The problem in regard to the utilization of the motive power of water courses is greatly attracting the attention of engineers. Now especially, that dynamo electric machines have entered the domain of industrial practice, experiments of the kind that we have here noted are multiplying upon every side.—*La Nature.*

DESIGN FOR PARLOR ORGAN.

Our engraving shows a design of an organ made many years ago, in which all the pipes are said to have been made of silver We present it to our readers with the hope that it may serve as a suggestion leading to the production of something new and good in the form of musical keyed instruments. We are tired of the present stereotyped shapes of our pianos and organs. Will not somebody strike out in a new direction? A suitable design of so novel and popular a character that people must have it would be worth many thousands of dollars to the manufacturer who secured it.

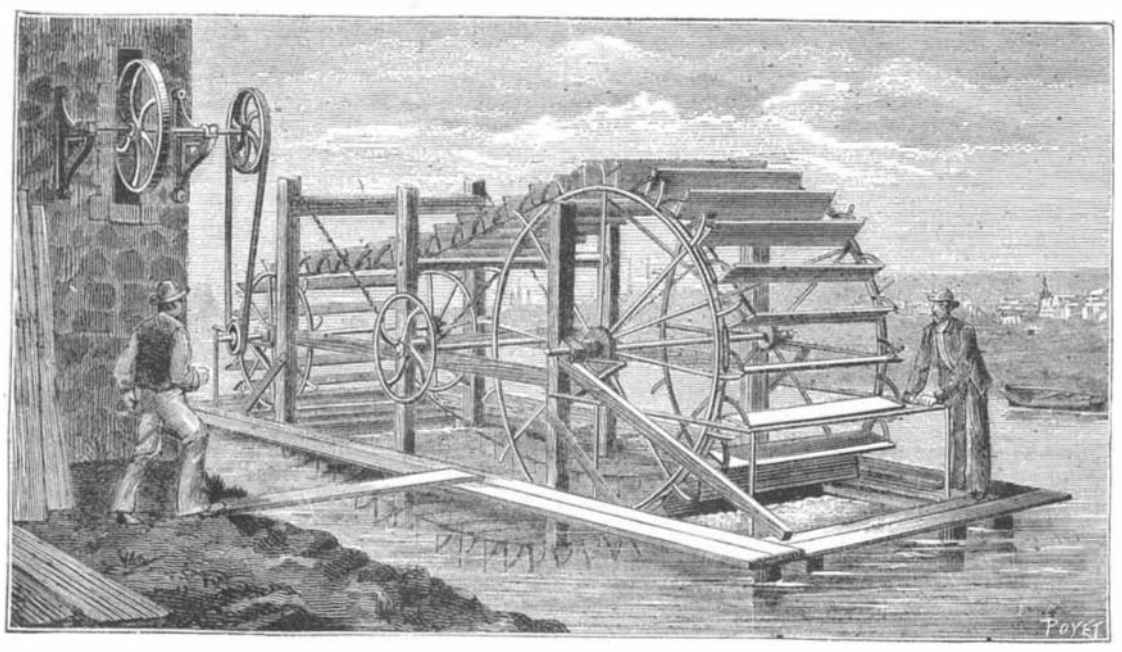


DESIGN FOR A PARLOR ORGAN.

The Fun of Running an Engine.

A reporter on the Chicago *Herald* had the following interview with a locomotive engineer:

"Lots of chaps think it would be fun to run an engine," said the driver, as he stuck his head, a flaming torch, and a long-necked oil can in under his machine, "but if the most of 'em would try it, they wouldn't like it quite so well.



ZSCHIESCHE'S HYDRAULIC MOTOR.

'Tain't everybody can run a locomotive, either, though I s'pose it's like running a daily newspaper, which I've heard tell everybody can do. Now, a nervous man has no business in a cab; no more has a careless one, or a stupid cuss. To run an engine a man must feel his responsibility, and keep his head level. I don't believe half the people know what it is to run an engine. Now, there's the machine; that's the first thing, and it has to be in good order, and stay so. A locomotive has to stand wear and tear and weather that'd knock a stationary engine into smithereens. And no matter what emergency rises—freezing of pipes, or starting of flues, a loosening of packing, or heating of journals—we've got to know just what to do, and do it right quick, too; then when we're running there's the time cards and pretty often a new one; and the train orders—they are a life and death and reputation to us, and to read 'em correct and live up to 'em gives us no end of anxiety.

"Bet I've read a train order over a dozen times an hour—I am always so afraid of making a mistake or forgetting. You know the consequence of even a little mistake, sometimes. Then there's the signals to watch, the conductor's gong overhead, steam to keep up, time to make, whistle posts and crossings to look out for, bad spots in the road to be careful on, and along with all this there's the track ahead of ye which your eyes mustn't leave for more'n five seconds. There's the brakes, too—one is always worrying about them. I don't s'pose everybody knows, either, that we have to be mighty careful when we come to the top of a grade. You see in going up she labors hard, and as soon as she begins to descend she makes a rush, and there's the danger of breaking your train when the rear cars are still dragging on the up grade. This danger is especially great on freights, but no good engineer fails to shut off some of his steam when his engine reaches a summit. It isn't every fool can run a locomotive."

Ethylene.

Before the Chemical Society on the 17th of April, Dr. P. F. Frankland read a paper on the influence of incombustible diluents on the illuminating power of ethylene. The present communication forms a sequel to a paper read by the author on the illuminating power of ethylene when burnt with combustible non-luminous diluents (Chem. Soc. Jour., Jan., 1884). In all cases the gases were consumed from a Referee's burner. Great care was taken to insure the purity of the ethylene and the diluents—carbonic anhydride, nitrogen, oxygen, and atmospheric air—employed. The author records his observations in a series of tables and curves. He sums up the principal results as follows: Mixtures of ethylene with the incombustible diluents carbonic anhydride, nitrogen, aqueous vapor, and atmospheric air, possess a lower illuminating power than pure ethylene. In all mixtures of ethylene with either carbonic anhydride, nitrogen, or aqueous vapor, the intrinsic luminosity of the ethylene is reduced. In mixtures of ethylene with atmospheric air, the intrinsic luminosity of ethylene remains unimpaired until the air forms about 50 per cent of the mixture.

Mixtures of ethylene with oxygen in insufficient quantity to form an explosive mixture possess a greater illuminating power than pure ethylene, the intrinsic luminosity of the ethylene being greatly increased. The disilluminating effects of carbonic anhydride, nitrogen, and water vapor are due partly to dilution and partly to refrigeration, *i. e.*, the cooling occasioned by the introduction of inert gas into the flame; this refrigeration is proportional to the specific heats of the gases, but in the case of the carbonic anhydride and aqueous vapor it is augmented by the absorption of heat which takes place in the dissociation of the aqueous vapor and in the reduction of the carbonic anhydride to carbonic oxide. Of the four diluents, carbonic anhydride, nitrogen, aqueous vapor, and atmospheric air, the first is the most and the last is the least prejudicial to the illuminating power; nitrogen and atmospheric air, however, become more equalized in their effects as the proportion in which they are present increases, complete disillumination of the ethylene being effected by the same proportion of each.

Bartholdi's Statue of Liberty.

A representation of this statue, as it will appear in place on its pedestal in New York harbor, has been published, as a large colored lithograph, by Messrs. Root & Tinker, of this city. The picture showing the proportion of the statue to the pedestal, with some view of the surroundings, gives a good idea of the whole as a work of art. The pedestal will be 177 feet 9 inches high, and the statue is 151 feet 2 inches, making the top of the torch 328 feet 11 inches above high water level.

THE latest novelty in advertising is a patent medicine manufacturer advertising for bald men who are willing to have advertisements painted on the tops of their heads, "for a high pecuniary recompense."

The Doctrine of Evolution.

The *Chemist and Druggist* (London) gives the annexed extracts from a paper read recently before the Oldham Chemists' Assistants' and Apprentices' Association by Mr. W. Buckley:

After defining the term evolution, the essayist remarked that it was generally confounded with the Darwinian theory, and gave an extract on the meaning of evolution from Dr. Hooker. He then proceeded to describe the various forms of animal life, beginning with the gregorina, and treating of the other forms to the vertebrata.

Gregorina is an animal found as a parasite of the cockroach, which takes in its food in any part of its surface. This is the lowest form of animal life.

Amœba was then described as seizing its food, which is forced through the mass of protoplasm and excreted anywhere.

Infusoria is a step higher, being distinguished by the possession of a definite mouth and œsophagus and egestive region.

Waterweed hydra, sea anemone, entozoa, earthworm, leech, insect, vertebrata, were described in order of superiority, the various changes in structure being pointed out until the highest point of animal life was reached in the case of the vertebrata.

The lecturer then explained the evolution of reproduction, describing the mode of reproduction, first, of the gregorina, by incystation—that is, the animal surrounds itself by a mass of gelatinous matter, and then splits up, each part becoming a fresh animal.

Infusoria are reproduced by splitting into two equal parts, and also by budding, a portion becoming attached to the animal, and after some time becoming free and having the powers of its predecessor.

In alluding to the descent of man, Mr. Buckley showed the similarity of the structure of the human being to that of some monkeys, especially the chimpanzee and gorilla, explained the arguments from the useless muscles of the human body, and indicated the reasons for regarding them as useless.

An Antique Roman Mosaic from Carthage.

BY G. H. HEAP, ESQ., CONSUL-GENERAL AT TUNIS.

Many who visited the Centennial Exhibition will remember seeing in the Tunisian section the large and beautifully executed mosaic representing a Numidian lion seizing an antelope. This admirable work, which probably dates from 100 to 50 years before the Christian era, is of Roman workmanship, and was discovered at Carthage in 1873. It formed a very small part of the vault floor of a temple dedicated to Astarte (Aphrodite), the tutelary deity of the Carthaginians. The Romans, who assimilated the gods of the people they conquered as easily as they absorbed their territories, erected a temple to the Goddess of Carthage, and adorned it with great splendor. It was situated on a commanding hill facing the sea, near the citadel and other public buildings.*

The Tunisian Government a short time since enacted a law prohibiting private search for antiquities, but granted this privilege to the son of the prime minister at that time in power. The finder of treasures or antique works of art was required, under severe penalties, to give immediate information to this official. The Arabs, however, in spite of imprisonment, bastinado, or fire, not unfrequently appropriated whatever fragments of sculpture, inscriptions, or mosaics, and especially funeral lamps and vases and coins, they might find, and sold them secretly to travelers and strangers.

Thus it came to pass, one day, that an old Arab sheik informed the British agent and consul-general, with a great show of secrecy and mystery, that he had discovered a wonderful mosaic floor, a portion of which he offered to take up and deliver for a consideration. He described the floor, which, even with due allowance for the imagination of the Bedouin, was evidently one of the most beautiful and complete works of the kind that had ever been discovered at Carthage. The sheik refused to tell where it was, but promised to bring the piece he had taken up to Sir Richard Wood's country seat, at Carthage, at night. He had recently "eaten stick," or received the bastinado, for having sold some antiquities to a tourist, and had reason to be cautious. A few nights later, however, he came with some eight or ten Arabs who bore the mosaic on their shoulders. A bargain was made, and the precious fragment was deposited in a magazine, where it remained until shipped to Philadelphia in 1875.

The floor of the temple from which it was taken has since been examined. It is of vast extent, and the designs were all life size. From the Arab's description it appears that the center figure represented a female, probably the goddess Astarte, driving a chariot drawn by stags, and around this central design were grouped animals of various kinds—lions, tigers, leopards, stags, antelopes, giraffes, boars, hares, even hippopotami, crocodiles, snakes, and fishes. The only part of the floor that the Arabs succeeded in removing besides the "mosaic lion" was the principal design, representing Astarte in the chariot. This was on its way to Sir Richard Wood's, when unfortunately one of the bearers slipped and fell, and the others fearing to be crushed under it—for it was even larger and more ponderous than the lion—allowed it to fall to the ground, where it was broken into fragments. The only portion, therefore, of this magnificent pavement that now exists is that in the National Museum; the rest was broken in the hasty and clumsy efforts of the Arabs to detach it in sections from its bed.

The "mosaic lion," as it came to be named at the Philadelphia Exhibition, is the largest and most perfect ancient mosaic in America, and it is quite unlikely that anything equal to it will ever find its way to the United States hereafter.

When the Vandals invaded Africa they destroyed all works of art, and to them are due the many headless, armless, and noseless statues found in Barbary. In destroying the temple of Astarte their iconoclastic frenzy was probably more immediately directed against the statuary and other sculptures and in overthrowing them, together with the walls of the edifice. The floor was covered with debris, upon which, in the course of centuries, a deep layer of dust was deposited, which protected the mosaic from the corroding effects of wind and rain, and to this we may attribute its perfect state of preservation.—*Proceedings Nat. Museum.*

* The remains of some of these edifices are still visible, although now the most conspicuous object is the chapel, erected in 1835 by Louis Philippe, King of the French, and dedicated to the memory of his ancestor, Louis IX., surnamed "the Saint," on the spot where tradition says he died of the plague in 1270 while besieging Tunis.

The Menace to the Patent Laws.

The British Government lately recognized the fact that its patent laws were not sufficiently liberal in their treatment of inventors, and accordingly it has subjected them to thorough revision, upon the very just theory that encouragement and protection of the inventive talent of a country is of direct advantage to the whole body of the people. Just as England has completed this reform, certain members of the American Congress have organized an assault upon our patent system, with an intent to make our patent laws far more unjust and far more discouraging to inventors than the British laws have ever been in modern times.

More than twenty bills, authorizing changes in the patent laws, have been introduced to Congress during the present session, and while nearly all of them inflict injustice upon inventors, some of them are positively iniquitous. We cannot summarize all of them, but some of the propositions contained in them are as follows: That any man may use any patent without regard to the owner's wishes or prices, by summoning a jury to fix a license fee; that no patent shall be granted for a longer period than five years; that a man who uses an infringement upon a patent can escape all penalties simply by pleading ignorance, the easiest plea that can be made; that the owner of a patent shall pay all costs of suing an infringer, even the fees of the infringer's attorneys, though the plaintiff may win his suit; that the owner of a patent in such a suit shall give bonds for the payment of costs, no matter how often the courts may have declared his claim valid.

These are but a few samples of the kind of legislation which is now threatened by the men who have been selected to make laws for this country. Respecting the whole mass of bills, we may say this: They represent simply a scheme to legalize the robbery of a class of men who have probably done more for this American nation than any other single class among our population. It was because the inventive genius of our people has had strong stimulation from the best set of patent laws now in existence, that we have been able to compensate for the scarcity and high price of labor in many portions of our country by the use of ingenious mechanical contrivances.

The man who will try to imagine what American farming, for example, would have been had not the farmer had at his command cheap labor-saving appliances, invented by Americans, may possibly form some kind of a dim idea of what this country has gained from its inventors and from the wisely ordered patent system which has inspired them to labor in all directions. The so-called patent reformers not only refuse to recognize that great obligation, but they propose to destroy the system which has achieved so much, and to violate the standing contracts made by the Government with the inventors, and for which the inventors have paid their money.

We do not hesitate to say that no Congress that ever sat in Washington ever offered a greater menace to the general public interest; and we may assert, further, that if this Congress supplements its ruinous agitation of the tariff question with these outrageous patent laws, it will be remembered with execration as a public enemy.

The plea made in behalf of the new bills is that innocent purchasers of patented contrivances have suffered under the present laws. No doubt there have been many instances of hardship of this kind, but the cases are comparatively few in number, and it is monstrous to replace a good law, which works occasional harm to the few, with a bad law which will work continual harm to the many. Innocent men have been put in prison, but that is not an argument for the abolishment of prisons. The right thing to do, if anything must be done, is to make more severe the penalties against the man who infringes a patent and sells it, and to give the innocent victim swift justice upon the man who has swindled him. But the truth, we suspect, is that the demand for a change does not come from unsophisticated countrymen who have been deluded by sellers of sewing machines and hay rakes. More probably it comes from rich corporations, who want to steal and use for nothing inventions upon which they are now compelled to pay royalties. The indications are strongly in this direction, and it will be well worth while for leading inventors to combine money and labor in an effort to get down to the bottom facts while the bills are pending.

The few disinterested persons who give their assent to these proposed changes probably persuade themselves that a new mechanical idea really is not "property" in the right sense of the word. They understand how a man can own a horse and sell it, but they do not comprehend how a man can own and sell an idea. This is just the kind of obtuseness that we expect to find in a savage, who has no conception of intellectual things; but it is amazing to find it among civilized and intelligent men. The truth, of course, is, that ideas, expressed in mechanical forms, have exerted such power as to transform the methods of civilized society. Every convenience in modern dwellings, every railroad, every steam engine, every labor-saving machine of every kind, is simply the embodiment of men's ideas; and the mental stimulus which was necessary to give such ideas expression and force was obtained, in nearly all cases, from the promise of money reward. A man who has got a good mechanical idea in his head, has something that is worth far more than any single piece of real estate; for it is something which may serve millions of people at one and the same time; while the real estate can serve only a single owner. The idea is *property;* and the government which forbids it to have any value when it is once made public, simply gives its sanction to a very bad form of robbery.—*The Textile Record.*

The Dancing Bird.

A recent issue of the *Proceedings* of the U. S. National Museum contains an account, edited by Mr. E. Ridgeway, of the collection of birds from Nicaragua, made last year for the Smithsonian Institution by Chas. C. Nutting. The dancer bird is thus described:

"Fam. Pipridæ. *Chiroxiphia linearis* Bp.

"Abundant. Spanish name 'Toledo' (pronounced 'Tolay'do') on account of a fancied likeness to their whistling note. The natives also call this bird 'Bailador' or 'Dancer.' It was not until I had been in the region for some time that I understood why it was given this name. One day, while hunting through the dense forest, the profound silence was suddenly broken by the regularly repeated note of 'El Bailador,' and softly making my way toward the spot whence the sound proceeded, I witnessed one of the most remarkable performances it has ever been my lot to see.

"Upon a bare twig which overhung the trail at a distance of about four feet from the ground, two male 'Bailadors' were engaged in a 'song and dance' act that simply astounded me. The two birds were about a foot and a half apart, and were alternately jumping about two feet into the air and alighting exactly upon the spot whence they jumped. The time was as regular as clockwork, one bird jumping up the instant the other alighted, each bird accompanying himself to the tune of '*to-le-do—to-le-do—to-le-do,*" sounding the syllable '*to*' as he crouched to spring, '*le*' while in the air, and '*do*' as he alighted.

"This performance was kept up without intermission for more than a minute, when the birds suddenly discovered that they had an audience, and made off.

"With a little practice one can learn to call the birds very readily. I could have secured a very large number in this manner, had I been so disposed. Twelve specimens."

Shoe Making by Machinery.

The *Shoe and Leather Reporter* justly remarks that the introduction of labor-saving machinery has been the most potent cause of the changes that have been wrought in the shoe manufacture within a decade. The genius of inventors has devised implements for doing pretty much all the work that is required from the cutting to the finishing of a shoe, and doing it so neatly that the inexperienced cannot distinguish hand work from machine work, and the experienced know perfectly well that the latter is for all practical purposes as good as the former. The instruments first contrived for sewing leather were crude and imperfect; there were so many little defects about them that they were not regarded with favor, and did not do satisfactory service. But by degrees the faults have been so completely remedied that they do their work admirably, until now three-quarters of the handsomest shoes sold in the country are put together by machinery. In the factories the hands are distributed into "teams," each team constructing a particular part of a shoe, many men contributing in their several ways to its configuration. Of course the closest attention has to be given to all the details; it is essential that the materials should be selected with discriminating judgment; that the cutting should be so skillfully done that there may be no waste of stock on the one hand, and no inferior material used on the other.

Refuge Pits in Wind Storms.

A Georgia correspondent writes us that storm pits are made in his section about 8 x 10 feet and 6 feet deep, with roof on a level with or just above the surface of the ground, being usually ventilated by means of pieces of stove pipe inserted in the roof. Our correspondent says it has been suggested that, there being sometimes ten or twelve persons in these pits, the moist, warm air rising through the pipes makes a good conductor of electricity, and so would render such locations dangerous during an electrical storm, although his own inference is that they cannot certainly be more dangerous than crowded churches or railway cars, which are seldom struck by lightning.