

water, the last a feature suggestive of the Orient. There are ladders everywhere; for though the houses beneath have doors, those that form the superstructure are not entered through those below. Above all the roofs are seen numerous clay chimneys, built in sections, and looking for all the world like the graded array of pots in a china store; while, oddly enough, they form the flues for what are practically the counterpart of the great, old-fashioned New England fireplace. A single slab of stone placed above the fire serves as a stove. Tables and chairs there are none, but Pueblo and Navajo rugs and blankets curtain the walls and carpet the floors.

In intelligence the Zunis rank with the Toltecs, Aztecs and Incas. Like them they have always dwelt in fixed abodes. One commendable feature of this people is the high pinnacle upon which they place their women. With them the woman is no drudge, as she is with the other American aborigines. She is never allowed to do the degrading work of the field. She carries the water and attends to the home, which, by the way, is her own, and from which, is she is so minded, she has the right to turn away her husband. The Zunis are the strictest monogamists, and while it is true that there is no modesty, as civilization understands it, in Zuni, yet there is no immorality. The Zunis are sentimental in the extreme and marry at a youthful age. When a youth is wooing a maiden, he will go and sit before her with his back turned to her, and untwine his head cloth. She rejects him by softly stealing away, or accepts him by running her hands caressingly through his loosened locks.

While they possess no written language like their South and Central American contemporaries, they have an unwritten literature that has come all the way down from their mythical beginning, verbatim. The Zunis never forget. It may be that reliance on the written words is the cause of the inferior powers of memory of the lettered peoples. The Zuni bible has four different divisions or books and each book is divided into four chapters, as it were. Half a dozen of the brightest youths of each generation are selected to serve the less fortunate as their books. On the minds of these are written, beginning at the age of twelve, the words of the sacred book. With the common folk all this is Greek, for it is transmitted in original Zuni, old English as it were, in order that every single syllable may be preserved intact.

Once the Zunis were strong in numbers and fortresses, but disease has thinned them down, and they have also been reduced by privation, resulting in some measure from their own confinement in a barren reservation, to the present number of scarce a thousand souls. Of late years they have broken down the barriers of seclusion and exclusion, that were a marked characteristic of the race. Until 1878 only one white man had ever dwelt in the place, and his stay was made not of his own volition. He was a cross-country mail carrier who was taken in by the Zunis and nursed during a sickness. On his recovery he was not allowed to leave the city. After months of search the unfortunate postman was traced to Zuni, and only on demand from a battalion was he delivered up. The stories told of the Zunis by this man found their way to the East and led to a scientist who became interested in them giving his life to the fascinating study of these people. This was F. H. Cushing, of the Smithsonian Institution; whose voluminous report was not published until after his death. He left Washington for Fort Wingate in the latter part of the seventies, and in the fall ventured, usually unaccompanied, from time to time, to Zuni, and gaining their admiration and respect he was finally allowed to enter the tribe. He was adopted by one of the governors and was required to dress, grow his hair, and live as they did, the people even urging him to marry into their tribe in order that he might inherit his foster-father's high position. This he refused to do, but later, when he took six of the great Chiefs to Washington, he selected a white bride for himself, who also became a member of the tribe. The Indians were so much impressed with what they saw on their journey that they offered Cushing the highest position in the tribe. "The white men are gods," said one of them. "It is a pity they have to live by eating of the earth as we do."

Cushing returned to Washington after a stay of over five years with this remarkable people; but he had become completely invalidated by the coarseness of the food and the various hardships he had undergone for the sake of science, and his death, which took place a year and a half ago, is attributed to these privations.

The Zunis are cruel in some respects, but in their intercourse among themselves they are courteous and would make admirable models for some of our civilized white communities. They never lose their tempers, nor do they discuss matters in violent tones. They consider it beneath their dignity to strike a fellow tribesman. The children are remarkably obedient, a fact which may be accounted for somewhat by their custom of killing the worst child in the village at a certain anniversary feast. They refuse to be taught to

read and write, and the two school teachers that now dwell with them can do no more than train them to sew and perform various domestic duties. Nor will they take up our religion. Their religious dances of supplication to the various gods and their dances of thank offering are numerous, but the great dance of the year is one that is held under the full moon of the month of May.

In the morning the Mudheads appear. These are naked performers with great clay masks over their heads, who rush through the streets shooting arrows into the hides and furs and feathers that are thrown in front of them. Subsequently these serve as clowns to the dancers. As a substitute for the sacrifice of the child, which was, of course, prohibited by the United States government, a band of fantastically garbed priests rush through the streets, carrying long switches which they lay unmercifully on anyone they happen to catch. At noon a number of dances, in which every god is impersonated, take place in the colosseum-like dance place, in which the natives who are not participants sit and applaud. The woman from the moon, the echo god, and the sun god are the most interesting. The echo god follows every utterance of the others a brief space of time thereafter, and he does it wonderfully well.

A feature which speaks strongly in favor of this curious people is, that unlike the nomadic Indians, with which the people of the United States are more familiar, they are very cleanly in their habits, an extremely important point when we remember that the Zunis always live in fixed habitations. Their food consists of curious paper bread, which is made by pulverizing grain, making it into dough and spreading it with wonderful evenness over slabs of stone. The bread bakes very quickly and is rolled into shavings, in which form it is eaten. Locusts are gathered every morning at sunrise, enough being laid by for each day's needs. They are roasted to a rich brown color and eaten. At the foot of the mountain on which the city stands, is a small salt lake, and in the neighboring valley a peach orchard which produces very fine fruit. Indian corn and maize grow fairly well under the hands of the Zunis, and the government can confer no greater boon upon them than by doing some work of irrigation, or at least by the construction of reservoirs; for it is a fact that the "water god," who is their chief divinity, showers his blessing upon them barely once a year.

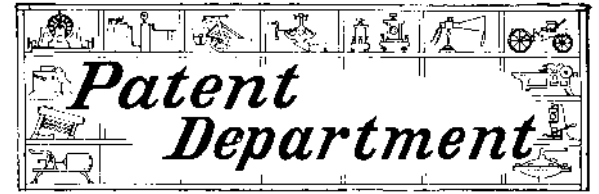
#### Weather Bureau Wireless Telegraphy.

The Weather Bureau has long been experimenting with suitable instruments for the transmission of wireless telegraphic messages. Recent experiments made by Prof. Willis B. Moore, the Superintendent of the Weather Bureau, have demonstrated the feasibility of the new apparatus which the Department of Agriculture will probably adopt. Prof. Moore stated that over water of wide expanse wireless messages could be sent accurately and quickly, and more rapidly than if wires were used; but that it was a matter of some doubt whether aerial communication would prove very successful on land. The Department used a new wireless receiver, in which a telephone is employed. The recent experiments showed that this apparatus operates faultlessly and rapidly. Prof. Moore states that he sent a message which, to be transmitted over a wire by electric telegraph, would require two or three minutes, and which was sent without wires at about the fastest rate of wire telegraphy over a land wire. What the particular construction of the Department's wireless telegraphic apparatus may be, has not as yet been disclosed.

#### Lord Kelvin on the Metric System.

The House Committee on Coinage, Weights and Measures, which is now considering the advisability of adopting the metric system in the various departments of the United States government, had two distinguished witnesses before it recently in the persons of Lord Kelvin and George P. Westinghouse. Lord Kelvin advocated the passage of the bill warmly. He remarked that he had long hoped that England would take the lead in this matter. If the United States were the first to adopt the system he had no doubt that England would soon follow suit. He was glad to see that the committee intended to allow a suitable time for the adoption of the standard before making it effective in order that the public at large might familiarize itself with metric terminology. Mr. Westinghouse also advocated this system.

Camden, N. J., will have a new shipbuilding plant soon, which will be quite as extensive as that of the New York Shipbuilding Company. The latter is situated at the lower end of the city, while the new one will be at Cooper's Point, which is at the other end of the city's water front. The plant of the Tway Machine and Blacksmithing Company has been secured, and the work of rearing the new shipbuilding plant will be begun at an early date. A marine railway, improved drydocks and the most modern appliances will be used.



#### PROPOSED AMENDMENT OF THE BRITISH PATENT LAWS.

The British press is at present quite a good deal exercised over the proposed amendments to the British patent laws. The object of the proposed changes is to so modify the existing laws of Great Britain as to place them upon a basis greatly resembling our present patent practice. It is designed by the proposed changes to establish a system of examination closely resembling the examination conducted by our Patent Office after an application has been filed. When any change in existing conditions is proposed in Great Britain, it almost invariably leads to a controversy, which is often conducted with more or less acrimony according to the degree of importance of the subject. The present instance is no exception, and it is with much of surprise that we note on this side of the water some of the objections offered to the proposed amendments. Some of the opponents claim that it is impossible to make a search which will be at all complete, and if such a search is not complete, it is of little or no value. It is contended by those who favor the bill that no search, however exhaustive it may be, can be absolutely complete, and that a search for fifty years through the patent records without doubt in many cases is not half complete, however carefully it may be made, but that such a search may be supplemented by an independent search on the part of the inventor if he wishes, and although the search may not be absolutely complete, that such completeness is only a matter of degree, but that it is desirable, although the result may not be absolutely determinate or infallible.

The great success which has attended our own practice with reference to the Patent Office search is, we believe, sufficient ground for the belief that the proposed legislation will be carried to a successful termination. The method of conducting an examination in the United States Patent Office is, in the main, very satisfactory. It is difficult to understand, however, how the British Patent Office will be able to carry out a sufficiently thorough examination for the small extra fee of \$5 which it is proposed to charge for the additional work of making the examination. It seems doubtful whether the British Patent Office could be made self-supporting for the fee charged, if the examinations are conducted on a basis as thorough as that in the United States Patent Office.

Not long ago a deputation called upon Mr. Gerald Balfour with the object of having a clause inserted in the bill, which would necessitate the technical working of a patent within a certain definite period. The object of this feature of the bill would be to establish promptly a new manufacture, or to have the patent become void or voidable, owing to the failure to work the patent in the time prescribed. A recent issue of Engineering, in a comment upon these statements, says that "the legislation of practically every important industrial nation, save that of our own country, has a provision to secure this (working) either directly or indirectly." It then naively remarks that "in the United States the high tariff serves toward this end; while in many other countries there are provisions in the patent law for voiding a patent if it is not worked in that country." It will probably strike our readers as a matter of news that the high tariff serves to operate in the same manner as a working clause in other patent laws. We have been accustomed during the past forty years to hear all sorts of benefits or evils saddled upon the poor tariff statute, but this is the first instance in which we have heard a claim of this character put forward. It is certainly a most interesting and ingenious contention. The same article also puts forward the statement that "while giving our German friends every credit for the enterprise they have shown in establishing industrial research laboratories, there can be little doubt that they have also benefited greatly by their patent legislation, which helps their traders enormously by making patents voidable if not worked within the empire." We can hardly believe that the success of the German chemical industries is due to the fact that their patents become voidable after a failure to work them within the empire, and that the English chemical industry has languished owing to the fact that they have failed to establish a similar practice. We surely believe that such a condition of affairs has arisen from very different causes, from the same economic causes, in fact, which have enabled so many American industrial products to gain a firm foothold in Great Britain. One of the delegates, Mr. Joseph Lawrence, stated that "when the Linotype machine was invented, fifteen years ago, he endeavored to obtain a license

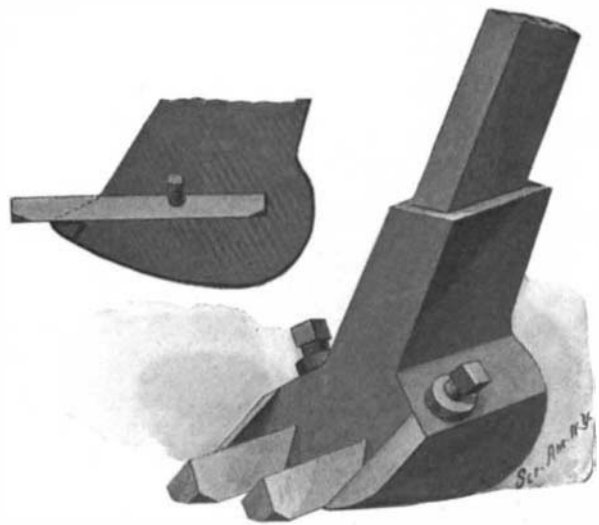
to manufacture in England. This was refused, and he was subsequently obliged to pay £800,000 for the British rights; while in Germany, the right to manufacture was sold on more advantageous terms, which enabled the German to enter and underbid the English manufacturer." These facts may be perfectly true, and may seem at first glance to have worked an injustice, but certainly such a condition of affairs cannot be attributable to this particular feature of the patent practice. We are inclined to believe that the value of a patent is governed principally by the ordinary laws of supply and demand, and we believe that in many cases it would work a great and real hardship, to compel the inventor to introduce his invention at, perhaps, an enormous expense and sacrifice, or forfeit the rights for which he has paid. In many cases it is practically impossible for an inventor alone and unaided to introduce a patented invention. A vast amount of capital may be required; it may be necessary to establish an extensive organization in order to introduce the invention; those who wish to control the patent may have a monopoly of such inventions and are unwilling to buy, and it seems a little hard to deprive the poor inventor of his rights simply because he fails to put the invention into actual practice within a limited time. If the invention is one of value and he is unable to introduce it himself, the time will surely come when some one will make him an offer, which it may be possible for him to accept. The inventor will then have received the reward of his invention, and the public will receive the benefit derived from his labors.

We are pleased to learn that before the deputation left Mr. Balfour, it was gravely remarked that the latter's reply proved "most unsympathetic." It is to be hoped, therefore, that nothing more will be heard of the matter.

**ADJUSTABLE CLAW-BAR.**

The claw-bar here illustrated is designed more particularly for drawing rail-spikes, and, as the title indicates, it is so constructed as to permit rapid adjustment or removal of the claws when desired. The claws are straight steel bars of triangular cross-section which enter corresponding openings in the claw-head, and are held in place by set-screws. The handle of the tool fits into an opening in the top of the head and is held therein by a set-screw at the side. Lips are formed on the head outside of the claws and brace them to prevent spreading. The base edges of the claws are beveled at each end to permit slipping them under the spike to be drawn.

As soon as the claws are worn out or become dull along their inner projecting edges it is a simple matter to unloosen the set-screws and make an exchange of



**ADJUSTABLE CLAW-BAR.**

claws, i. e., to place the right claw in the left socket and the left one in the right socket, thus presenting new edges to the spike head. When the projecting ends are completely worn out the claws may be reversed in their seats, and when both ends are dulled they can be readily removed, the worn-out ends cut off, and then re-inserted in the head, or they may be replaced by new claws whenever desired.

By virtue of their shape the claws can be easily passed under the spike-head, and when pressure is brought to bear on the handle the rounded heel of the claw-head forms an excellent fulcrum on which the claws are raised and the spike withdrawn from the tie. Mr. Thomas Woodhouse, of Leadville, Colorado, is the inventor of this adjustable tool.

George W. Gardiner, of Philadelphia, has devised a propeller-gear which consists of a frame arranged in a trunk formed in the vessel, adapted to be lowered below the bottom so as properly to place the propeller in the water. If the vessel be of the centerboard type, the trunk carrying the centerboard may be enlarged so as to also receive the propeller-gear.

**ODDITIES IN INVENTIONS.**

**COMBINATION REVOLVER AND DARK LANTERN.**—The revolver shown in our illustration would be of inestimable value in case of an emergency at night. Its distinguishing feature lies in the small incandescent lamp situated in a reflector tube placed immediately below the revolver barrel. A battery in the



**COMBINATION REVOLVER AND DARK LANTERN.**

handle of the revolver may be electrically connected with the lamp by a slight pressure of the trigger. Thus, should a man suspect a burglar in the house, he can use his revolver as a dark lantern to find his man and insure good aim before firing. As soon as the piece is fired the trigger returns to its normal position and separates the electric wires, thus affording the operator the protection of darkness. Mr. F. D. James, of Seattle, Wash., has obtained the patent for this invention.

**COW-MILKER.**—There remain in these days of invention but few hand operations which cannot be



**A COW-MILKING MACHINE.**

far better performed by machine. Even the milking of cows is now done by a vacuum device. The apparatus comprises a can provided with an air-pump by which the air in the can may be exhausted to a certain degree of rarefaction, as indicated by the vacuum-gage at the top of the can. A flexible tube is connected at one end with the can and at the other end with the udder of the cow by means of four teat cups. As soon as a sufficient portion of the air has been exhausted from the can the teats are placed in the cups and the stop cocks opened, which causes the teats to be drawn inward, making an air-tight joint. The suction then draws the milk through the hose into the can. A pneumatic ring in each cup prevents injury to the cow and an outer adjustable cylinder prevents the teat from being drawn in too far. The lower portion of each cup is glass, which permits the operator to watch the proper working of the device. The pump and gage are arranged to be easily applied to any milk-can. W. R. Thatcher and N. W. Hussey, of Oskaloosa, Iowa, are the inventors of this apparatus.

**AUTOMATIC DRIVE-GATE.**

A simple and inexpensive mechanism is shown in the accompanying illustration by which gates for drive-

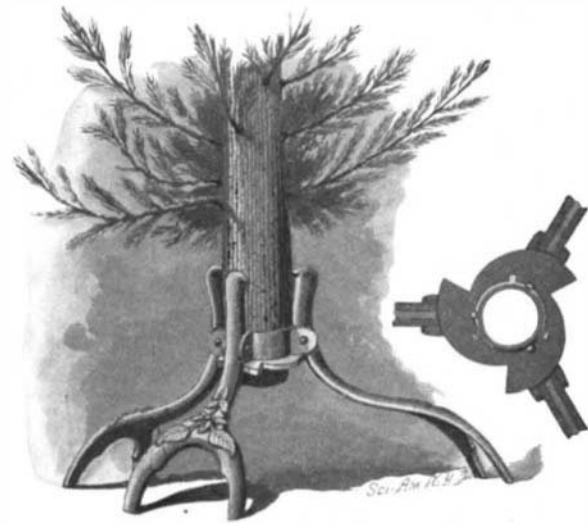


**AUTOMATIC DRIVE-GATE.**

ways may be opened or closed from either side by the driver while he remains seated in his vehicle. The gate is hinged to a post projecting upward a considerable distance above the fence. At the top of this post is a cross bar extending in both directions parallel to the roadway and supported near one end by a standard against which the gate swings when opened. Mounted to swing on the hinged post is a weight-actuated lever to which is pivoted a sleeve sliding freely on the pintle rod of the gate. The lower pintle of the gate fits loosely in an eye-bolt on the hinge post. It will readily be seen that by lifting up the weighted lever the upper pintle rod will be drawn back out of its horizontal position and be given a backward tilt. This, of course, will lift the gate off its latch, and since the center of gravity is changed the gate will swing around on its axis until it strikes the standard at the side of the road. The weighted lever is operated from the vehicle by a cord or draw-line passing through a pulley on the end of the lever and over pulleys on the cross bars. The depending ends of this draw-line are provided with handles, and are knotted just outside of the end pulleys, so as to prevent one end from sliding out of reach when the other is pulled down. To properly operate the gate, the draw-line should be given a smart pull, which will carry the weighted lever over past the vertical position and permit it to drop over toward the rear. As soon as the vehicle has passed, a quick pull on the other end of the draw-line carries the lever back past the vertical and permits it to swing to its original position. This restores the normal center of gravity and causes the gate to swing back against the fence post, to which it is secured by the ordinary gravity-latch. The gate was invented by Mr. P. C. Forrester, of Chicago, Ill., and is now being built, under the name of Forrester's Automatic Gate, at 269 Dearborn Street, Chicago, Ill.

**TREE-STAND.**

The stand illustrated herewith forms a simple yet very firm base for holding Christmas trees and the like. After the tree has been placed in position the device can be firmly locked, thus insuring perfect rigidity of the connection. The body of the device is tubular in form, tapering to a smaller diameter at the bottom, so that the tree may be firmly wedged therein. The legs, which are pivoted to this body portion, have a wide extension so as to present substantial bearing on the floor. On the upper inner portion of each leg a spur is formed. These spurs are adapted to sink into the trunk of the tree. When the tree is forced into the body of the device, the legs are first drawn together, thus spreading the spurs apart to admit the tree trunk. After the tree is seated, however, its weight spreads the legs apart and causes the spurs to sink into and grip the trunk. Mounted to rotate on the bottom of the



**TREE-STAND.**

body portion is a disk having three peripheral cam surfaces, one for each leg. As soon as the tree has been secured in the stand this disk may be turned to bring the cam surfaces into proper contact with the inner faces of the legs and thus lock them in their gripping position. The stand is the invention of W. C. Krick, of 1287 Broadway, Brooklyn, N. Y.

**Acetylene-Black.**

Lamp-black, which for hundreds and hundreds of years has been the chief ingredient in dark pigments, may perhaps be eventually displaced by acetylene-black. The chief merit of the new substance lies in its freedom from grease and, therefore, in its more ready manipulation. It is said that acetylene-black is admirably adapted for the uses of the manufacturer of printing inks. The high cost of acetylene-black is the only obstacle that bars its general introduction. A field is, therefore, opened to inventors in devising a method of producing the substance cheaply in large quantities. At present the black pigment is obtained by decomposing acetylene through the medium of an electric spark.