

or pirates. This tribe is about the most intelligent of all the tribes inhabiting the islands. Here also we find the spectacular Bagobo tribe, notable for their beautifully-ornamented costumes, who come from the highlands of the interior of Mindanao. Finally, we have the Christianized Visayans, with their village built over the waters of the lagoon. The people of these native tribes are all to be seen engaged in their native pursuits and manufactures.

The central plateau of the exhibit grounds is occupied by several buildings, many of which are reproductions of actual structures in the Philippines. There is the Agricultural Building, containing the work of the Bureau of Agriculture of the Philippine Islands during the past three years; and a most encouraging display it is, including exhibits of several hundred varieties of rice; of cotton and process of manufacture; of various grasses of hemp and other fibers; of tobacco, etc. Then surrounding the central plaza will be seen the Ayuntamiento, the Cathedral, the Commerce Building, and a typical Manila house, all of which are fine examples of the better class of Manila structures. The most striking of these is the Cathedral, which is a miniature reproduction of the cathedral at Manila. In this building are installed the exhibits of education, and part of the art exhibit.

Three years after the first landing of the American troops, the transport "Thomas" reached Manila Bay with a shipload of American teachers on board. After three years of work, the result may be summed up by stating that "the English learned by the Filipino people in the past three years is greater in amount than the Spanish they acquired in the four hundred years of Spanish rule." The education exhibit shows the work of the elementary schools and the high schools, thirty-six of which latter have recently been established. One of the most charming features of this section is a Philippine school, shown in active operation in its schoolhouse of bamboo and Nipa palm—an exact duplicate of a country school building in the islands.

The Commerce Building on the south side of the plaza contains samples of the imports of the islands and the articles of native manufacture, while in the Manila Building is installed a collection of the textile fabrics of native manufacture, including exquisite laces, and embroideries so fair and delicate that one wonders how they have stood the transportation.

The Forestry Building is a large structure of hardwood framing and flooring, with Nipa sides and roofs. In its construction one hundred different kinds of woods indigenous to the islands were used; and it should be understood that the forests of the Philippines, which are of vast extent, form one of the most valuable assets of the government, containing, as they do, all the tropical hardwoods, such as ebony, mahogany, rosewood, etc. Limitations of space forbid any lengthy mention of the Ethnology Exhibit, and the Fisheries Exhibit on the shore of the lake, which includes one thousand mounted specimens of the different fish of the islands, and a collection of the native fishing gear, including bamboo fish traps and corrals, and the various styles of fishing boats.

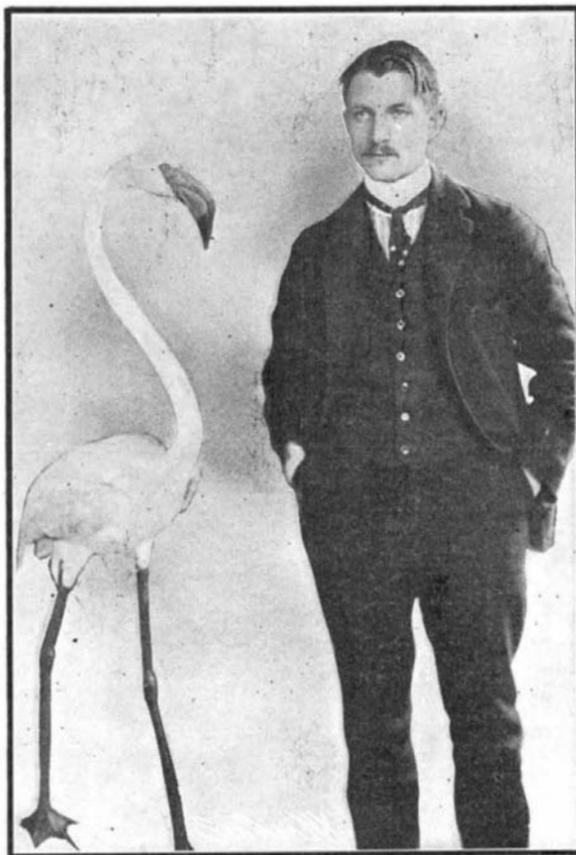
The mineral wealth of the Philippine Islands, which is known to be very great, is as yet only in the preliminary stages of development. There are extensive beds of lignite and indications of petroleum. Gold exists in almost all of the islands, iron is abundant, and for many years the Igorote has made his own jewelry from the gold deposits of the Benguet Hills. A comprehensive display is made of the different native metals and minerals. Concluding our notice of this most creditable exhibit, it is not stretching the point too far to say that, if the average American citizen came to this great Exposition and did nothing more than spend his time within the government Philippine inclosure, the time and expense of his visit would be amply justified; for he can learn, during two or three days spent on these grounds, more about our new possessions than he could pick up in many months' travel throughout the islands themselves. Speaking for himself, the writer can say, that at the close of a most delightful day spent in these grounds, he left them with a distinct feeling of pride in the far-sighted wisdom of a government that could conceive and put into such splendid execution a project such as this. Moreover, the last doubt was removed from his mind that, in this matter of colonization, the latest and most difficult national enterprise upon which this nation has embarked, the government would achieve one of the most successful and

beneficent works in the history of the United States.

THE FLAMINGO AND ITS QUEER NEST.

BY WALTER L. BEASLEY.

After considerable difficulty, Prof. Frank M. Chapman, of the Department of Ornithology of the Ameri-



THE BAHAMA FLAMINGO.

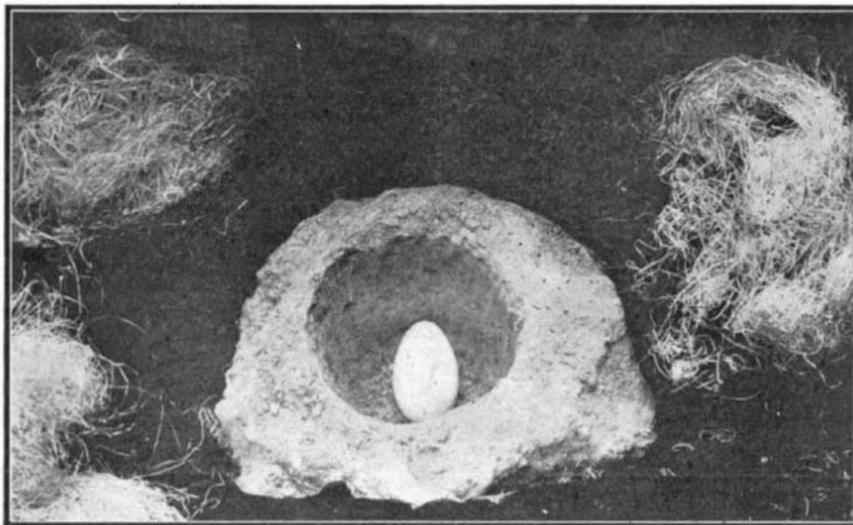
can Museum of Natural History, has secured the first flamingo nests ever brought to this country.

There are about seven species of flamingoes, three of which are in America, frequenting the Bahamas, Florida, and Cuba. In height the flamingo averages about five feet. If its curved neck were stretched to its full length the bird would tower above the head



COLONY OF FLAMINGO NESTS, BAHAMA ISLANDS.

of an ordinary man. During May and June, the breeding time, the birds' bright-colored plumage is faded, but reassumes its most radiant hues in winter. When first hatched the young have a straight bill, which, after a time, develops into one of bent shape. The first plumage is grayish-white and passes through various tints of pink, rose, carmine, or vermilion to the full scarlet of the adult, which reaches its deepest



A FLAMINGO EGG IN ITS NEST OF MUD.

shade on the wings. Several years are necessary to perfect the final gaudy plumage.

The eggs are white, showing a blue tint when scraped under the surface. They are long, oval, and have a thick shell, equaling in size that of the common goose. The flesh is not palatable to the taste, being extremely oily. The birds feed upon both animal and vegetable matter from the ooze and soft bottoms of the shallow waters and lagoons selected by them both as a feeding ground and nesting place. When flying their long legs are stretched out behind, and the neck is extended. They have a peculiar voice and a sort of one-syllable outcry, which they utter as an alarm signal the moment they are approached or believe themselves to be in danger. On account of their keen-eyed and wary nature it is almost impossible to get within close range of them.

Prof. Chapman gives the following account of his work in the Bahamas:

During the winter the birds live chiefly on the west coast of the island, where the shallow water and soft marl bottom afford them an abundance of food and prevent pursuit either by boat or on foot; but in May they gather in some lagoon in the interior of Andros Island, far from the habitations of man, to rear their young. These breeding resorts are few in number and their whereabouts are comparatively unknown. We succeeded in reaching a large flamingo rookery well in the heart of Andros without undue difficulty. Our schooner was left at anchor behind the shelter of some outlying reefs, and the final part of the voyage was made in small boats.

The locality is only a few inches above the sea level, and is characterized by wide stretches of shallow lagoons bordered by red mangrove trees, with occasional bare bars of gray marl, and by outcrops of coralline rock so eroded and waterworn into bladelike edges and sharp, jagged pinnacles, that walking is attended by much danger. Our tents were pitched on a sand bar, and preparations made to visit the flamingo colonies known to exist in the vicinity.

Subsequent research showed that the locality was regularly frequented by these birds as a breeding resort, but that apparently a different spot was chosen each year. Eight groups or villages of nests were found within a radius of a mile, each evidently having been occupied only one year. The largest of these, placed on a mud bar only an inch or two above the level of the surrounding water, was a hundred yards in length, and averaged about thirty yards in width.

An estimate, based on an actual count of a portion of this colony, gave a total of two thousand nests for an area of, approximately, only 27,000 square feet. This rookery we judged to have been occupied the previous year. At a distance of a mile we found nests scattered about in a dense growth of mangroves. Here the birds were found at work upon their nests for the present year.

A flock was seen which was estimated to contain about seven hundred birds—a sight of surpassing beauty. Although no shot was fired and a retreat was promptly made, the birds were disturbed by our intrusion, and either discontinued operations or removed to some other locality, and eventually we were forced to leave without seeing fresh nests. Those in process of building, however, told somewhat the manner of their construction. Those built among the mangroves were in an excellent state of preservation, a few even containing eggs. The task of getting these nests into the hold of the schooner was one of great difficulty. The largest secured measured 18 inches in diameter at the bottom, 13 inches at the top, and 9 in height, and weighed upward of 160 pounds.

Being one solid mass of mud and dried only externally, it needed only a slight jar to break the strongest of the nests into fragments, and the prospect of transporting the specimens to New York in safety seemed one of uncertainty. The Bahama negro boatmen were not accustomed to delicate work of this character, and it required special inducements in the way of pay to tempt them to wade barefooted through the lagoons and to travel over the keenedged rocks with burdens of from 50 to 150 pounds on their heads.

The nests were placed in the canoe and reached the schooner with the breaking of only three out of nine specimens. In Nassau they were treated with a solution of gum arabic, which hardened them, and after being wrapped in plaster of Paris bandages they were packed separately in large boxes and reached New York in excellent condition. Specimens of the flam-

ingoes themselves were also secured. The nests collected differed from the conventional idea of a flamingo's nest in being much lower and of a greater diameter. Doubtless the height of the nest is governed by the rise of the water. Built wholly of mud, which is scooped up from about the base of the nest by the bird, it is necessary that the site chosen shall be near enough to water to insure an abundant supply of soft material. Such a site, however, brings the nest within reach of the tide, and places it in a low situation, which may be subsequently flooded by heavy rains. Consequently the birds must build their nests high enough to protect their contents from the water.

These two conditions have resulted in the production of a mud cone, which, in the colonies examined, was never more than twelve inches in height, but those as high as eighteen inches have been reported. In the slightly hollowed top of the adobe dwelling house a single white egg is laid.

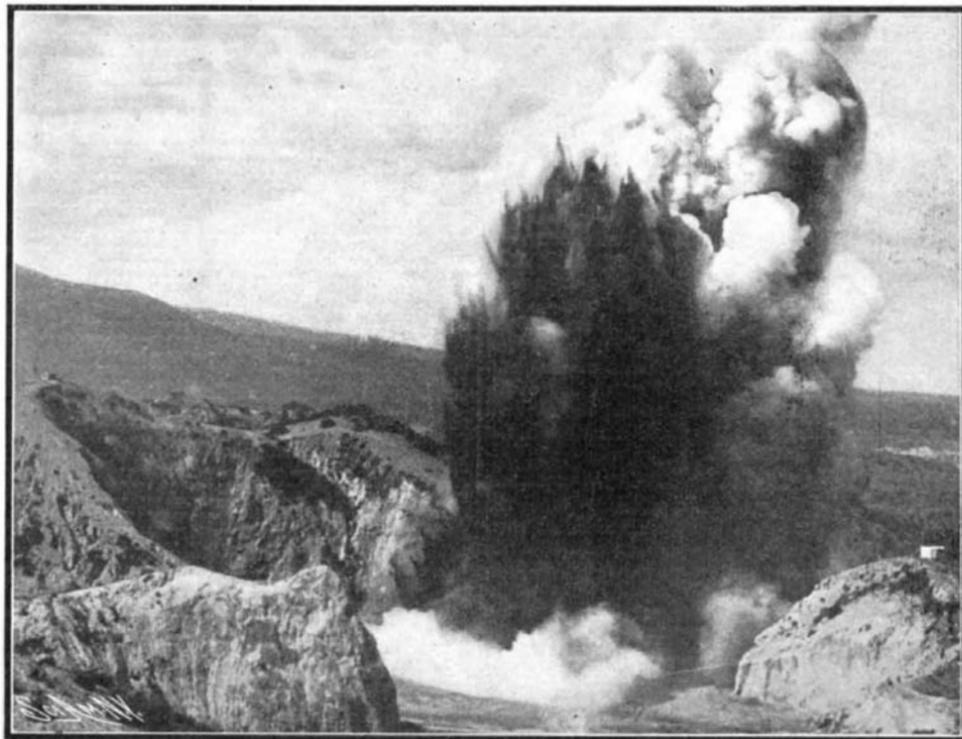
The single nest here figured, however, has been excavated to a greater depth than the original in order to lighten it for transportation purposes.

THE GREAT ROTORUA GEYSER OF NEW ZEALAND.

BY JAMES A. WARNOCK.

Yellowstone Park is reputed to have the most magnificent geysers in the world; but their reputation is based upon the statements of travelers who have never been to New Zealand, and who know nothing of its natural wonders.

Leaving Auckland by a fast express train, a journey of eight hours brings one to Rotorua, where may be seen the most splendid geyser which is probably to be found anywhere in the world. To give one some idea of the magnitude of the geyser, I need mention only the height of some of the surrounding objects. On the extreme left of the picture herewith reproduced, over the "Inferno Crater" (which contains a seething lake of water) is a small shelter shed, 450 feet above the plain. The surface of the water in the geyser basin, when at rest, is



THE GREAT ROTORUA GEYSER IN ERUPTION.

about 40 feet below this plain. From these figures it is easy to compute the height of the eruption. In the instance illustrated, that height must be about 900 feet. This is by no means exceptional. Higher "shots" have been recorded. I have myself seen a shot computed at 1,200 feet. Some months ago the area of the basin was measured in a small boat by a Mr. Buckridge and a guide. They found that the area is about 2½ acres, from which it may be inferred that this geyser may well be called the largest in the world.

The geyser plays about twenty-two times each month, is very erratic, and gives no warning when it is about to erupt. The theory is advanced that the basin is somewhat like a funnel, and that when the water and stones are ejected, the larger stones return and jam in the neck, thereby choking the outlet, so that an enormous pressure of steam must shift them. When the pressure is sufficiently great to blow out the obstructions, it naturally would eject water to a great height. The theory, however, is at best rather fanciful.

This geyser is not the only one to be seen in the vicinity. Others may be mentioned, such as the Pohutu, Wairoa, Feather, Papakura, and others, besides mud volcanoes.

A Saw-Proof Bar.

Perry D. Zeigler has invented a bar which cannot be sawed or cut through, for use in connection with prison-cells, windows or doors, and safety-vaults.

In carrying out his invention he takes a metallic bar of any suitable material, preferably iron or steel, and in the bar adjacent to its corners he provides longitudinal apertures. In the case of a round bar a number of apertures adjacent to its periphery are provided, and, if desired, as an extra precaution one or more holes may be present. The bar having been formed as described, molten glass or the like is poured into the apertures. After this has cooled, the inventor claims it would be impossible to saw through the bar, for the reason that the saw would not cut the glass, and only a partial fracture of the bar could be obtained.

Breaking of Staybolts.

Staybolts break more frequently in bad-water districts than in those districts where the water is freer from incrustating solids, says Mr. H. A. Fergusson, in a paper read before the Western Railway Club of America. This is not to be attributed to the action of the water on the bolts, but to the fact that such engines are washed out very much more frequently, with consequent vibration of the bolts each time. There is apparently no remedy for this, where water-purifying stations are absent, except a flexible staybolt, and while numbers of these have been designed and tried, there are none of them that will not become inflexible through the hard scale formations around the movable parts. The best bolt, therefore, is one which has the greatest flexibility, and which cannot be affected by scale.

RECENTLY PATENTED INVENTIONS.

Of Interest to Farmers.

PRUNING-SHEARS.—C. F. CROSBY, Burlington, Vt. The object of this invention is to provide pruning-shears of simple, light, yet strong construction, having no parts liable to get out of order, and so arranged that there will be very little friction of the movable parts and with which a clean cross-cut may be made without drawing action, which would have a tendency to break the bark.

BEE-TOPPER.—J. M. CARAWAY, Longmont, Col. A distinguishing feature of the invention is the provision of an endless horizontal traveling belt provided with a spring-coil for holding the bees while being topped, and an oscillating knife or cutter, which is adapted to make a draw cut and is operated by the same means as the belt.

BINDER ATTACHMENT.—A. M. DAVIS, Madison, Wis. The object in view of the inventor in the present improvement is to decrease the friction attending the formation of the gavel in a self-binding harvester of any sort and also to assist in separating the bundle from the unbound grain. The means adopted enable the binder to be run more readily than ordinarily.

PLANTER.—A. D. EZZELL, Clinton, N. C. By Mr. Ezzell's invention corn, cotton, peas, etc., may be conveniently planted in rows, and the quantity of seed planted is regulated by means of the slide in the charger or rocking dropper, and the distance apart of the hills planted may be regulated by the projections or pins on the wheel, as the pins may be increased or decreased in number as desired. The apparatus plants seeds forty-two, twenty-one and fourteen inches apart.

Of General Interest.

PLATEN PRINTING-PRESS.—R. R. WILLIAMS, Marshfield, Wis. To obtain a perfect impression in platen-presses, the platen often requires to be adjusted higher or lower, corresponding to slight variations in the height of the type-form. Such adjustment is usually effected by several jack-screws, which operation requires much time, and it is also difficult to secure a perfect adjustment or one in which the platen will be perfectly parallel to the type-form. The adjustment can be made quickly and easily and with perfect accuracy.

ORDER AND RECORD FILE.—H. J. REES, Iowa City, Iowa. In this patent the object of the invention is the provision of an improved means for recording and preserving orders and expense and other accounts in

order of dates of the calendar—that is, day by day and month by month, the latter being summarized at the end of the year.

SASH-LOCK.—J. NOSEWORTHY, St. Johns, Newfoundland. The object in view in this case is the provision of a construction adapted for application to the opposing faces of the meeting sash-rails, so as to be concealed when sashes are closed and locked. The sashes automatically lock when closed. The lock is provided with a detachable operating device adapted to release the lock when it is desired to open the sash, the device when detached preventing access to the lock, so that it cannot be released by evil-disposed persons.

PIPE-STAND.—B. C. NEWLOVE, Walsenburg, Col. The special purpose in this instance is to provide means for supporting the outer end of a pipe while work is being done on the inner or opposite end. Such means to be practically effective must be stable, admit of easily shifting of the pipe in longitudinal directions, and of easy adjustment with respect to height at which the pipe is held. These requirements are answered in the structure, which consists in a base, a column, the length of which may be adjusted at will, and in a head, on which the pipe is supported to move freely longitudinally, these parts having special structure.

FASTENING DEVICE.—P. MORRISON, Chattanooga, Tenn. The invention relates to knockdown furniture, and its object is to provide for fastening two parts or members of furniture, crates, packing boxes, and other articles together without the use of screws, nails, or similar fastening means, the device being serviceable as a support for shelves and the like.

SCHOOL-LOOM.—BEATRICE E. LINDBERG, Faribault, Minn. In this case the invention relates to a device for teaching children the art of weaving and for enabling them to produce small woven articles. The improvement lies in an attachment which enables hammocks to be woven. The loom with the said attachment is particularly adapted to kindergarten purposes for weaving dolls' hammocks; but is adapted to hammocks of a large size.

SPLINE-WEIGHT.—F. K. LORD, Bayonne, N. J. The invention has reference to drawing instruments; and its object is to provide a spline-weight arranged to firmly hold the spline or batten in a curved position at any desired place on the drawing-surface to allow the draftsman to conveniently draw a line along the unobstructed front edge of the spline.

MASSAGE APPARATUS.—J. U. JONES and G. JONES, Chattanooga, Tenn. This apparatus

is in the nature of a multiple vibrator and massage machine. The inventors provide a device for use by barbers, physicians, nurses, and others who desire to secure a vibration or massage treatment, also for special use on the face, scalp or other portions of the body. In the practice it is found the machine runs smoothly and quietly, and is pleasant and beneficial in its effects upon a patient.

LUMBER-DRYING KILN.—C. H. HALL, Jacksonville, N. C. The invention has reference more especially to kilns for the drying of lumber, though well adapted to the drying of other materials. One of the principal objects thereof is to overcome numerous disadvantages and objections common to many other structures hitherto devised for similar purposes and to simplify and cheapen the cost of construction of the kiln, as well as to lessen the labor of management or control of the operations thereof.

Household Utilities.

COOKING DEVICE.—C. C. OVERTON, New York, N. Y. In this patent the invention pertains to an improved device for cooking meats, fish, and the like, in the oven of a stove, and at the same time imparting thereto the peculiarly delicate flavor of meats and fish cooked after what is commonly termed the "planking" process.

FOLDING BED.—D. F. KING, Louisville, Ky. The invention has reference to improvements in beds in which may be used a hinged box-mattress, the final objects being to secure a bed which when folded will offer to view the minimum upright surface, one in which can be used the comfortable type of mattress known as the "box-mattress," and one readily converted, when folded, into a settee, giving no hint of the concealed bed.

WINDOW-CLEANING CHAIR.—H. HARRISON, New York, N. Y. The purpose of the improvement is to provide a chair capable of being expeditiously and conveniently applied and fastened to windows of different widths and as conveniently removed. Another is to provide one which will constitute a safe and firm window-seat and which will guard the occupant at the back and sides, whether sitting or standing.

FUNNEL.—W. E. BURGESS, Dan-y-graig, Aberbeeg, England. The invention of Mr. Burgess relates to an improved funnel for filling vessels with liquid, and has for its object to provide means whereby during the filling operation the level of the liquid may be ascertained, the said level being exhibited externally of the vessel, so that the invention is of special utility in connection with the

filling of casks and other vessels constructed of opaque materials.

Machines and Mechanical Devices.

PROPELLING APPARATUS FOR AIRSHIPS.—A. V. WINEGARDEN, Leon, Kan. Broadly stated, the invention is embodied in two series of endless chains or bands that are spaced apart and travel on sprocket-wheels or pulleys arranged in a rigid frame and a series of sails or flexible sheets which are so connected with the said chains or equivalent that when traveling in one direction they are expanded and stretched, so as to act upon the air with greatest effect, and when moving in the reverse direction they collapse and practically feather, so as to offer minimum resistance to progress.

CIGAR-MAKER'S MACHINE.—E. WINTERER, New York, N. Y. It is a common practice for cigar-makers to thrust the head end of a cigar-bunch into the mouth to shape the bunch and to extract one or more pieces of tobacco filler with the teeth, and common to use gum or paste, flavored as with licorice, in order to make the "flag" of the wrapper adhere to the head in finishing the cigar. The inventor seeks to overcome unsanitary and contaminating objections by the provision of a simple machine which carries on the manufacture free from objections, lessens labor, facilitates work, and increases the output.

MACHINE FOR MAKING PIANO-HAMMERS.—E. T. WOLF, New York, N. Y. By this invention Mr. Wolf is able not only to reduce the cost of making hammers, but he produces hammers of a superior grade, the same being characterized by an improved pointed shape given to the striking-face formed by the condensed fibers of the felt covering at the end of the molding. He is also able to make all sets of hammers alike and uniform with respect to hardness and evenness of the felt by having an accurate gage of the amount of pressure applied.

Prime Movers and Their Accessories.

HYDRAULIC PRESS.—E. CROWE, Birchholm, Sheffield, England. The invention has for its object to effect economy of time and power, and so increase the speed of working and the efficiency of the press. This end is attained mainly by the provision of means whereby the idle descent of the press-head onto its work may be effected quickly and by gravity alone and whereby the power of the pumps is caused to come into action automatically immediately the tool carried by the press-head encounters the work. Mr. Crowe has invented another