CENTRAL AFRICAN HABITATIONS.

Commander Cameron, R.N, whose famous journey across Africa has proved so rich in valuable additions to our geographical knowledge of a little-known portion of that continent, gives, in the record of his travels, the sketches from which the annexed illustrations are made. Both represent discoveries which will afford an excellent idea of the ethnological importance of a study of the people of Central Africa and their habits.

Fig. 1 represents the curious village of Manyuema, where the explorer found the houses arranged in regular streets, and the latter kept scrupulously neat and clean. The inhabitants, although cannibals, are much more civilized than their neighbors, and appear to be a conquering race which has enslaved the tribes of the vicinity. They are skillful iron workers, and erect furnaces which show considerable inventive ability.

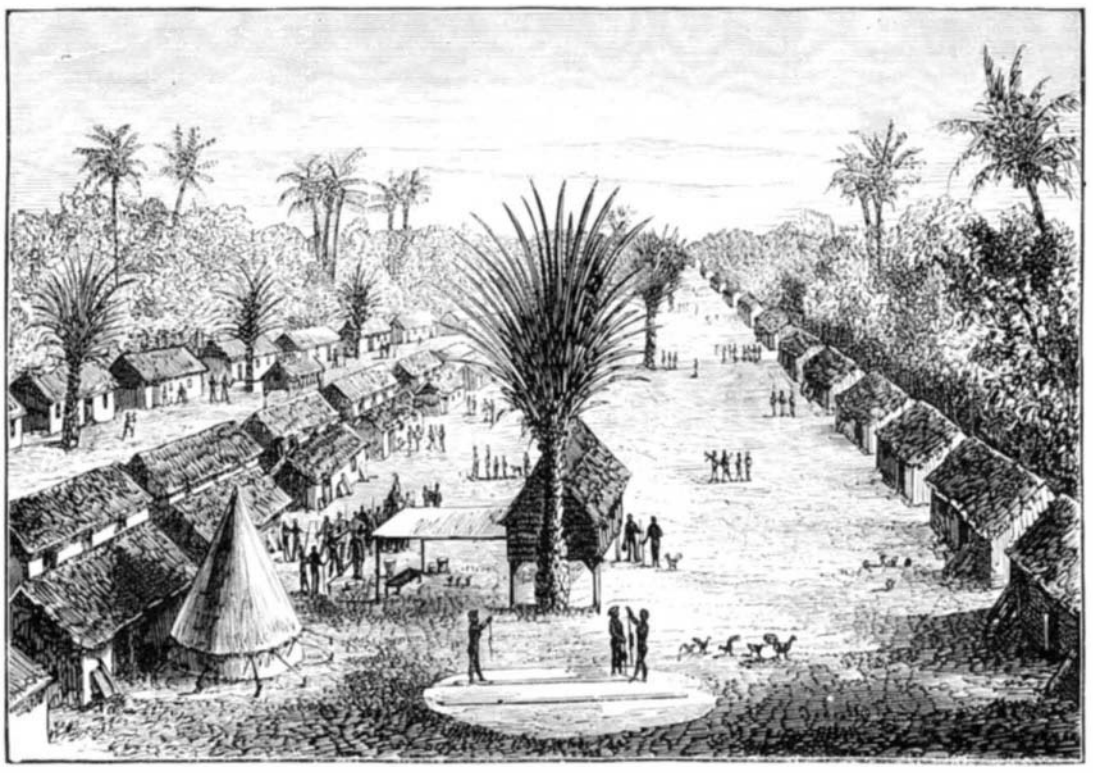

Fig. 1.—THE VILLAGE OF MANYUEMA.

It is well known that, in prehistoric times, whole villages were often constructed on piles, above lakes. Relics of these dwellings have been abundantly found, belonging to extinct peoples representing all stages of civilization, from the age of stone down to the dawn of the iron age. It is not understood why the ancients adopted this form of habitation. Protection from hostile tribes, safety from wild beasts, and convenience in fishing, have all been suggested; but there are reasons which go to show that none of these explanations are entirely satisfactory. Commander Cameron has found the same species of dwellings in use on Lake Mohyra, in Central Africa, and in Fig. 2 one of the huts is represented. The inhabitants are excellent swimmers, and, although provided with boats, frequently take to the water in preference to using them.

The lake dwellings of which our engraving gives a specimen are to be found in all parts of the world. The oldest known are in Switzerland, and in that country they have been thoroughly explored. They are of two kinds, those built of fascines and those built on piles. Those of fascines were commonly used on the smaller lakes of Switzerland, and wherever the bottom was too soft to hold a mass of piles firmly; those of piles were built in deeper water, where the waves would sweep away a foundation of fascines. Lake dwellings as old as the stone age are found in some parts of Russia, and in Borneo and the Malay archipelago, as well as in Africa. Herodotus mentions them on Lake Prasias, in Thrace; and as these were connected with the shore only by a single narrow bridge, the inhabitants were enabled to defy the troops of Darius. Each family occupied one hut, and caught fish by letting a basket down through a trap door.

In Switzerland, large settlements of lake dwellings have been discovered in Lakes Zurich, Constance, Geneva, Neufchatel, and others; and from one in the little lake of Moosseedorf, near Berne, a vast quantity of very interesting relics of the stone age have been found, together with weapons and implements made of teeth and horns of animals, and fragments of pottery. A lake village at Robenhausen, in the Canton of Zurich, contains numerous dwellings, and it has been estimated that 100,000 piles of oak, beech, and fir were used in its construction; and three different sets of piles indicate as many different periods of construction. Wheat, barley, burnt apples and pears, beech nuts, cherry stones, fragments of cordage, and cloth of flax and bast, and stone relics, were found here in great profusion.

Similar structures have been found also in the lakes of Scotland and Ireland.

Fig. 2.—AFRICAN LAKE DWELLING.

Shams.

If there is any special curse under which the world at large, and our own country in particular, is laboring, it is that of *sham*. Both directly and indirectly, shams effect an injury; and this injury is both material and moral. It is, however, hardly supposable that the latter aspect of the case will nowadays have much attention paid to it; society seems calloused, and, possibly, the only way in which shamming can be made unpopular is to show that it is unprofitable. To show that shamming and shams are also in very bad taste, as well as being dishonest, would be quite easy; but it seems as though the high road to man's reason lies through the pocket. Shams are uneconomical in most instances. The desire to appear better than facts warrant leads, in nearly every case, to a sacrifice of some cardinal merit. Thus the textile fabric of a given material, weight, and strength may be combed up, or filled in, or highly calendered, until it simulates a nobler material, has a greater weight and bulk, and assumes a more costly appearance; but the first operation weakens the fibre; the second renders it brittle; the third takes the life out of it. The "doctored" fabric neither wears as long, nor looks as well after a short use, as though untampered with. In furniture, the attempt to imitate elaborate carving has lead to, and in fact encouraged, weak and unworkmanlike construction. The present style of building offers a premium on slight in hidden work; and we find houses in which our grandparents lived unpretending lives, outlasting those which we ourselves put up.

Professional and "practical" (?) men, devoid of, and in many cases incapable of receiving, the proper training, have intrusted to them our lives and our property; and by their ignorance endanger them both. Instruction is given, or pretended to be given, and yet where (by some rare chance) solid and practical studies are undertaken, they are slurred over so that when the time comes when we need them, the facts or rules which should be "at hand" are forgotten, if indeed they were ever learned. Vessels are built of poor iron, and commanded by poor officers; they go down, or run ashore and break in the middle, and the account of "profit and loss" has an entry, running more or less into the hundreds of thousands, on the debit side.

Patent attorneys, of more or less enterprise and "cheek," procure patent papers with big red seals thereon, and fob their clients' (or victims') money; and when the time comes to test them, any one can drive a triumphal chariot of infringement through the claims and never ruffle a plume.

Bridges with any amount of ornamental work and stylish paint (in showy places) are thrown across streams or chasms, and over them heavy trains are thundered, until some cold still night a chord snaps and travelers' wives are widowed by the score, and everybody shudders—and goes on shamming and being imposed on just the same as ever.

A theater has a gaudy domed ceiling which shows deep and heavy panelling, frescoed in the highest style of the art—a flash and a blaze and a quick licking of flames, and the whole disgusting sham curls up and drops upon a panic-stricken audience, and the entire tinder-box of a man-trap crackles and falls, and in it are the sickening corpses of a happy unsuspecting throng; all the world is horror-struck, and inspection is rife, and committees rampant for a term of days; and now we all go into sham theaters the same as ever; attend sham churches and pray to be delivered from lying and hypocrisy; as if half the columns and mouldings were not flat and downright lies, and most of the brown stone fronts simply paint and sand or thin veneer. To be sure, the "columns" scale off and look ridiculous, and have to be renewed, and the brown stone fronts get measly if shammed with paint, or if of thin sheets, buckle out and tumble down and kill a passer-by now and then; but then paint can be renewed, and there are plenty more passers-by in the world. A split pin or a key is left out, or insufficiently driven home, and a flaw in a bedplate is filled up and painted over, in a piece of heavy machinery run at a high speed; and some day there is a thud and a crash, and castings are broken, and forgings twisted, and six or eight thousand dollars' worth of damage done; and every one stands round in sham shoes and wonders how it happened. A large percentage of patents granted is for "substitutes," as though there were not sufficient fertility in lying, and enough originality in covering the lies up, without protecting the—the —(well, we might as well say it) the liars.

A prominent Methodist divine once rode from Washington to San Francisco on a free pass granted to his brother, and made out in his brother's name. He afterwards "hoped the Lord would forgive him for *telling a lie three thousand miles long.*" But there is not a city in our land in which there are not lies covering acres of ground and towering up stupendously in their magnificent pretension; sheet iron lies, pretending to be granite; cast iron lies passing themselves off for marble; and plastered brick lies, shamming sandstone; and in them merchants are selling cotton velvets, and baryta paints, and fusel oil whiskey, and leaded "tinware," and soap loaded with water, and all kinds of abominable shams; and we (bless our dear unsuspecting, unmindful souls!) enjoy it all immensely, and keep on stealing from our right hand pockets to put into the left, and then boast of our superior acuteness and progress. And the devil, or whoever else it is that gets a share of what we waste and a dividend on all that we cheat ourselves out of, looks on and laughs, and pockets the income brought him by *sham*. And, doubtless, as long as we can stand it, he can. But how long can we stand it?—*Polytechnic Review.*

April Management of Bees.

Mrs. E. S. Tupper tells the readers of the *Bee Keeper's Magazine* how to treat bees during this month (April), to produce the best future results. She says:

In all places near timber, bees find natural pollen now, in average seasons; and if the colony has a prolific queen and they have honey or are fed, the brood should be abundant and young bees appear fast. This state of things should be encouraged, and then you are sure of good working colonies. Where bees are thus doing well, empty combs may be added from time to time, as fast as hatching bees are plenty enough to cover the brood. We have in early seasons and in strong colonies had comb built to some extent in April. Two years ago we gave comb foundations to several colonies in April, feeding them quite liberally with diluted honey, and we had ten full combs completed in the hives in eight days. We found always a great gain in using the comb foundations.

Usually no comb is built until much warmer weather than we have in April, and we attribute our success then to the heat generated by a very large number of bees in hives very tight. We would always take care to have the quilts, blankets, or mats snugly tucked in and the entrances quite small, so that all the heat possible may be maintained.

If there are wild cherry trees near your bees, they should not be allowed to store honey in boxes or frames while the bloom of these trees continued. We have seen honey that was unsalable from wild cherry flower.

If it is intended to multiply colonies this year, by the last of April it is well to begin raising surplus queens to be ready for the season when dividing is in order. Our way to do this is to take combs from the best and most prolific queen we have, with brood in all stages in the cells, and plenty of young adhering bees with them. Two of these combs will do, but three or four are better. Put these in an empty hive (a small one if you have it), and take it to a dark cellar or bee house for a few days, taking care of course to supply it with syrup or diluted honey. You can set it where you please when taking it from the cellar, for the bees will mark their location. They will start a number of cells, and these may be used for forming new colonies, or the cells may be preserved in nucleus hives until fertilized and the queens be used. Young queens are of great value in dividing; and you should begin in season to rear them.

Plants and Insects.

Sir J. Lubbock, M.P., recently delivered a lecture at the Society of Arts, London, on "Certain Relations between Plants and Insects." The lecturer said that he would endeavor to bring before them in a condensed form what was known in regard to the importance of the functions which insects performed for plants, and the attractions which plants provided for the insects. Neither plants nor insects would be what they were but for the influence of the other; indeed, some plants were altogether dependant on the visits of insects. He thought that there was no doubt that, as Sprengel originally suggested, the true use of honey to flowers was to attract bees and other insects. Ants, however, were also very useful to plants in destroying caterpillars and other injurious insects which fed upon them. M. Foret watched from that point of view a large nest of *formica giratensis*, and he found that the ants brought in dead insects—small caterpillars, grasshoppers, etc.—at the rate of 28 per minute, or 16,000 per hour: which, when it was considered that the ants worked all day, and sometimes during summer weather all night, it would be easy to see what important functions they fulfilled in keeping down the number of small insects. Some of the most mischievous of the class of small insects—certain specimens, for instance, of aphis and coccus—had turned the tables on the plants, and converted the ants from enemies to friends, by themselves developing nectaries and secreting honey, which the ants loved. They had all seen the little brown ants running up the stems of plants to milk their curious little cattle, and by the adoption of that ingenious idea not only did the aphides and cocci secure immunity from the attacks of the ants, but even turned them into friends. They were subject to the attacks of a species of ichneumon, and M. Delphine had noticed the ants watching over them with a truly maternal vigilance and driving off the ichneumons whenever they attempted to approach. Certain plants would produce no seeds at all unless they were visited by insects.

In some of our colonies the very useful common red clover will produce no seeds on account of the absence of humble bees. The same remark applied to the non-production of seeds from the scarlet runner in Nicaragua. Even in cases where it was not absolutely necessary, it was better that the plant should be fertilized by the pollen from another flower. Ants if they left one plant generally crept to another of the same kind; but cross-fertilization was wanted for flowers, and hence they required insects which readily flew from one flower to another. Even in the case of many small plants, such as crucifera, composita, saxifragæ, which might well be fertilized by ants, the visits of flying insects were much more advantageous. Moreover, if the plants were visited by ants, not only would they deprive them of their honey, but they would destroy the bees. If an ant was touched with a bristle it would turn round and bite it with its horned jaws; if, then, the delicate proboscis of a bee was bitten by an ant in the same way, its power of procuring honey would be quickly destroyed altogether.

The lecturer gave instances of plants and flowers which were naturally protected from ants by their natural formation, in some cases the stems being covered with bristles, in others being "sticky," thus preventing the ants from creeping up them. That was the case with plants which bore horizontal or upright flowers. In other cases the ants could readily reach the outer leaves of flowers which were pendulous, but could not get at the honey, or if they attempted would generally fall to the ground. Among the former class of plants were the *lamium* and the *carlina vulgaris;* among the latter the snowdrop, the cyclamen, etc.

The lecturer next called attention to several varieties of "sleeping flowers," some of which slept during the day, others during the night, opening and closing at different periods of the day or night, and said that he thought that the explanation was due to the fact that bees and wasps were flying about very early in the morning, while the ants did not come out till the dew was off the grass, and therefore could not get at flowers which were by that time closed.

Passing to the second portion of his lecture, Sir John said that the larvæ of insects taught many instructive lessons. It would, in fact, be a great mistake to regard them merely as preparatory stages in the development of the perfect insect. They were much more than that, for external circumstances acted on the larva as well as on the perfect insect, and both therefore were liable to adaptation. The modification which insect larvæ undergo might be divided into two kinds, namely, "developmental," or those which tended to approximation to the mature form; and "adaptational" or "adaptation," namely, those which tended to suit it to its own mode of life. Some of the larvæ were very dissimilar in their perfect form, others were not much altered in their ultimate shapes. Among the former class were the larvæ of moths, sunflies, and beetles. Among the latter class were the centipede, the weevil, the sitaris, the anthran, etc. The classification of insects founded on larvæ would be quite different from that founded on the perfect insects. It would puzzle a very good naturalist to determine the species of ant larva; while the larva of butterflies and moths was as easy to distinguish as the difference in the perfect insect was palpable. The lecturer proceeded to explain the different species of caterpillars: that their outer coatings, varying from dark brown to light green, and spotted and striped specimens with shades of various hues, had in each instance been provided with such colors for the purpose generally of being almost indistinguishable on the flowers and plants which they affected. In one or two cases, indeed, the reverse was the case, inasmuch as a striking contrast was created; but in those instances the insects were unfitted for the food of birds, who could thus easily distinguish and avoid them. Much, however, yet remained to be discovered; but, in conclusion, he might say that in the insect kingdom there was not a hue, or spot, or color which did not serve some purpose or perform some function, or which was not of some use in the economy of Nature."

Surveying the State of New York.

The report of the Board of Commissioners of the State Survey, for the year 1876, has just been issued. In it the necessity for a thorough survey of the whole State is pointed out as a measure of economical value to the people. The report says:

"The officers of the survey found, in intercourse with the people in those sections which were visited, that there were evils growing out of the prevailing ignorance with regard to the topography of our State, which exceeded anything before suspected. We learned that large numbers of our citizens, a great proportion of whom were women; and persons dependent upon small estates had been induced to invest their property in railroad stocks or bonds which had proved to be of little or no value, and that these investments were made upon solicitations and statements which would not have been listened to if the maps and surveys of New York had given any idea of the character of its surface. If these maps had shown our people the relative heights and positions of our hills and valleys, and the natural channels of commerce, they could not have been induced to invest their money in projects so placed that failure was inevitable. Had there been but a fair knowledge of the hills and valleys of our State, these disasters never could have happened. Our citizens would have been protected against reckless or fraudulent enterprises, as the people of England or of Switzerland are protected, by maps and surveys which show at a glance the character of the country, and to which it is their practice to refer whenever they are solicited to invest in this class of public improvements. We have already discovered several instances where roads have been carried over hills at a ruinous cost, not only of construction but of operation, where valleys might have been followed at comparatively small expense, and which would have furnished a larger and more profitable traffic.

"As illustrating the grossness of these errors, we find that on our best map Buffalo is placed about three miles from its true position, Elmira about three miles, Ogdensburgh half a mile, Syracuse a mile and a half, Plattsburgh three miles, and similar misplacements wherever tests have been applied. Lake Champlain is laid down from a survey made before the Revolution. Recent measurements show that, with respect to distances of twenty miles on the lake, the maps are in error as much as three miles. The maps of New York we find to be worse than those of any other civilized country of equal wealth. Even Japan has a rough triangulation of her territory a hundred years ago, and has now a more accurate work of similar character in progress under American officers. Every European government has executed a careful survey of its territory based upon triangulation, not because they are richer than we, for Switzerland and Sweden are poorer, but because they are wiser than we, and have observed the waste that follows bad surveys and false and deficient maps. A triangulation of Massachusetts was made nearly forty years ago; a similar work is in progress in New Jersey; Pennsylvania has a topographical survey under way, and like surveys are advancing in California, Nevada, Utah, Colorado, New Mexico, and Wyoming. When New York attains distinction as the worst mapped wealthy State in the world, it is time to consider whether this marked deficiency has not already produced serious evils, which are generally felt, even though their cause is not understood.

"For these evils we propose the same remedy that other governments have tried with perfect success—a trigonometrical survey. By this means points about ten to fifteen miles apart should be exactly determined in position throughout the State, the work being verified by reference to the surveys of the general government. This system of points, perhaps twelve miles apart, will form the principal triangulation of the State survey, and every effort will be made to have both the courses and distances between stations known with utmost precision, and to have them marked with monuments which will remain for many generations. This is usually done by burying below the frost line an earthen jar of peculiar form and marking, with its center at the point to be preserved, while directly above it is placed a stone squared and marked with the number of the station, and projecting enough above the surface of the ground to be readily found. These principal stations would be placed upon prominent hills overlooking the neighboring country. Where principal stations are too far apart for convenient use in local surveys, secondary and tertiary stations must be fixed by trigonometrical measurements from the principal stations. These secondary and tertiary points would also be preserved by underground marks and surface monuments of cut stone. Their distances apart would be determined by the character of the local surveys to be based upon them, being nearest together where land is most valuable. Those familiar with the subject well know that such points and lines can never be lost. They form an enduring base upon which each county or town can found special surveys of any degree of precision. All property lines or public boundaries measured and referred to the State survey points will be permanently fixed. The use of the magnetic needle will no longer be necessary, since the course of every line will be astronomically determined, and the accuracy of surveys can be tested by connecting with two or more of the State monuments.

"An annual appropriation of $20,000 for ten years will, we think, complete a State trigonometrical survey in such a manner as to furnish accurate bases for local surveys throughout the State in every town where they are needed, and secure the corners of the counties. This estimate is based on careful examinations during the summer, and has been compared with the cost of surveys elsewhere."

Paralysis in the Peas.

The London *Punch*, alluding facetiously to the popular scare on poisonous canned peas, adds a few lines of chemical fact worth remembering. Beware, says the writer, how you try the effect of strychnine, prussic acid, or any other poison, on a rabbit or a guinea pig. Have the fear of the Anti-Vivisection Act before your eyes. If you want to try experiments with poisons on a living animal, try them on yourself. Should you kill yourself, unintentionally, the law will acquit you of suicide, as it does not forbid any donkey to experiment on a donkey. Suppose, for instance, you want to know what is the effect of repeated small doses of copper upon the human system, take a fraction of a grain of the sulphate or acetate of that metal once a day continually till you discover. Ultimately you will find it produce paralysis. You will lose the use of your hands or legs, or one side, or more, of your body. Salts of copper will paralyze you sooner than even salts of mercury. But you must take them in minute quantities. In large doses they mostly rid you of themselves—copper acting like antimony. In order to take your copper pleasantly, your best plan will be to swallow it at dinner time, daily, along with green peas. This you can do all the year round, as peas are always to be had preserved in tins. You can mix your copper with your peas if necessary. If the peas are of a dull, grayish, faded, ugly color, there is probably no copper in them, and you may have to put some. But when their tint is a beautiful bright green, then you may suspect that there is plenty of copper in them to cause paralysis if persevered with sufficiently long. The copper is mingled with the peas to make them look pretty; and few people seem to be deterred by the fear of poison from preferring pretty-looking peas to plain ones. It is possible, however, that it may become rather less easy than it has been heretofore to procure tinned peas, which besides being tinned are also coppered. Several foreign provision dealers have lately been summoned before Mr. Knox, and, on medical evidence, fined for selling tinned peas containing copper in dangerous quantities. As they sold them in ignorance, they have been let off with nominal fines, but in future venders of coppered peas may expect to incur a penalty of $250 for each offence—and have to pay. Of course the multitude ignorantly eating peas greened with copper must be, all of them, greener than any peas. Bright green tinned peas may always be suspected of containing copper. If there is any question on that point, it may be summarily settled by pouring on the peas a little strong liquid ammonia, which, if copper is present, will make them turn bluer than even their seller will look when he is fined $250. So also with pickles, only the vinegar of the pickles will require a large excess of ammonia. In case there is no ammonia or other means at hand of determining whether the greenness of peas or pickles is owing to copper or no, a philosopher would give copper the credit of the color, and himself the benefit of the doubt.

A New Photo-Sculpture Process.

In the United States Army Department at the Centennial, there was exhibited a handsome model of the Rock Island Arsenal. It is to be regretted that this work of art did not bear some description as to the manner in which it was produced—an explanation of which we find for the first time in the recently issued report of the Chief of Ordnance of the United States army. From the various buildings, it appears, positive photographs were obtained, representing all their different sides. Each view was then exposed over a thick film of sensitized gelatin covering a glass plate, and afterwards the soluble, opaque portions of the gelatin were washed out. The film was then swelled by a peculiar process, so as to magnify its differences of level, until a suitable relief was obtained; and a plaster cast being taken of the film, it gave a permanent mould from which many repetitions could be made. A successive series of these plaster views, taken from the different sides of a house, were mitered together at their edges; and when roofed in, they formed a perfect reproduction of the house itself, every stone and crevice being represented. In one building, the slats of a lattice work around the piazza were plainly exhibited, in lines not over 0·006 inch in width. The model was made by Baron F. Von Egloffstein, of this city.

Evaporation of Nitroglycerin in Dynamite.

According to recent investigations of Captain Hero, of Vienna, it appears that a specimen of dynamite made in 1871 lost in five years 2·2 per cent of its nitroglycerin, and another sample manufactured in 1872 lost in four years 1·52 per cent, through evaporation. The conclusions are that regular times should be fixed as limits for the employment of dynamite supplies, and that, when the material is kept beyond these periods, it should be replaced by fresh. It is also suggested that, to allow for this loss, a larger proportion of nitroglycerin than the percentage now employed (ranging from 71 to 73) should be introduced in dynamite.

The Niagara Railway Suspension Bridge.

Messrs. W. Milnor Roberts, Chief Engineer N. P. R. R., T. E. Sickels, Chief Engineer U. P. R. R., and W. H. Paine, Assistant Engineer New York and Brooklyn Bridge, who were lately employed to examine the Niagara Railway Suspension Bridge, and to report upon its state and stability, have concluded their labors. They report that they first examined carefully those portions of the bridge supposed to be defective, and found, at the anchorages where the strands are separated and pass to and around the shoes, some of the outer wires somewhat corroded with rust: particularly at the first anchorage opened, where eight or ten wires were corroded quite through.

All of the badly rusted portions of the several wires have been removed until perfectly sound wires were found underneath. The portions removed have now been replaced by splicing a new piece to each individual wire under the strain due to the weight of the bridge.

The state of the strands now at this anchorage, and the general condition of the strands at the other anchorages, lead them to the opinion that there is at none of them a diminution of strength from corrosion of half of one per cent, which is as little as might be expected in any iron bridge structure standing the length of time this has stood; and it is to be noted that the oxidation of the wires has not taken place in the main cables between the towers, but at the extreme shore ends near the shoes where the strain is less than it is elsewhere.

Careful tests have proved conclusively that the wire has lost none of its original strength from the strains to which it has been subjected, and there is no reason to believe that the bridge is now less capable of carrying the usual trains or the test load which was at first imposed upon it.

During the examinations they carefully noted that the action of the bridge under passing loads is normal; and as the heaviest locomotives and trains of eight or more loaded freight cars during this period were constantly using the bridge, they had excellent opportunities of observing their effect.

A further report, accompanied with drawings, is to be submitted at an early day, in which will be stated in detail the examinations that have been made and the results of numerous tests of the strength of wire from the cables.

Effect of Sunlight on Flour.

It is maintained, says *The Millstone*, that the inferior quality of certain kinds of wheat and rye flour is frequently due to the action of sunlight on the flour; even when in bags or barrels the gluten experiences a change similar to that occasioned by heating in the mill. The tendency thus imparted to it, to become lumpy, and to form dough without toughness, is similar to that of most grain, or of flour when it is too fresh, or made from grain ground too early, or when adulterated with cheaper barley meal. Such flour can be improved by keeping some weeks.

Recent American and Foreign Patents.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED HAME FASTENER.

Tunis H. Poland, Farmersville, Collin County, Tex.—This hame fastener comprises a pair of plates and a set of gradulated links. Upon one end of the strap is formed an eye or hook to receive the hame loop. Upon the other end is a hook, to be hooked into one or another of the links. This fastening can be readily fastened and unfastened without taking off the gloves, and with cold and benumbed fingers, and when fastened will hold the hames securely. This invention is for sale. For terms, etc., address the inventor as above.

IMPROVED BRUSH.

Lewis Uttz, Nora Springs, Iowa.—This consists of a brush head, with a recessed bottom and side lugs, in connection with a broom whisk fastening wire, that is wound around the head and the whisk ends, and retained by lugs and suitable end fastening.

IMPROVED SLATE.

George S. Velez, New York city.—The object of this invention is to provide an improved device for facilitating and expediting the multiplication of larger and smaller numbers by the assistance of mechanical means. It consists of a slate with a sliding slate rule, guided in a slot or recess of the slate, and worked in connection with the graduated or subdivided edges or the adjoining slate sections.

IMPROVED BAG FASTENER.

Constantin Lazarevitch, Brooklyn, N. Y.—This invention consists in a rectangular frame of metal sewed to the mouth of the bag at one side. It is shorter than the width of the bag, and is provided with buckle-shaped catches at its lower side near each end, which are each provided with a number of bars. A bar of metal having formed upon it two hooks capable of engaging with the bars of the buckle-shaped catches is sewed on the side opposite the rectangular frame. The parts are so arranged that the loose sides of the mouth of the bag may be folded in upon its contents, and the rectangular frame closed over the loose sides of the mouth. The bar having the hooks is closed over all in such a manner as to draw the side against the rectangular frame, and is then hooked to the buckle-shaped catches.

IMPROVED BALE HOOK.

Henry Hauschildt, New York city.—The object is to provide for the handling of bales an improved hook that is rigidly connected to the handle without working loose therein, or injuring the hand of the workman using it. A cross pin is passed through a longitudinal hole of the handle, and an eye of the shank end of the hook. The shank end may be threaded and screwed into a screw socket of the handle, the key being also threaded at the end and screwed into the wood of the handle at the side opposite to the longitudinal entrance hole of the key.

IMPROVED COMBINED COLLAR AND HAME.

Ezra Stroud, Riceford, Minn.—This relates to an improved collar and hame combined, which may be fitted in flexible and easy manner to any size of neck of a horse, and which admits the adjustment of the draft on the hame, and the convenient opening and closing of the collar and hame for putting the same on or off the neck.

IMPROVED HEATER.

José Guardiola, Chocolá, Guatemala.—This consists of a heating furnace of new and improved construction, for heating air for drying purposes, and for heating buildings, etc., having an inner and outer cylindrical shell inclosing an annular air space, and a central air pipe and radial pipes, that connects the same with the annular air space, and a firegrate and fireplace. The device also consists of a cold air pipe leading from the blower pipe to the hot air pipe beyond the heater, for the purpose of introducing cold air in the place of hot air into the drying apartment when desired. This invention was described and illustrated on p. 82, vol. 36.

IMPROVED HARNESS TRIMMING.

Isaac N. Just, Belding, Mich.—This consists in the combination of the swinging wedge block, having its bottom concaved, and provided with a flange along its rear edge, and an extension having the inner side of its bottom bar concaved or flat with the terret. In using the device the free end of the tie-strap is passed through the cavity of the extension and is drawn back for a suitable distance. It is then drawn forward and draws the wedge block into the cavity of the extension, and clamps the said tie-strap securely between the lower edge of the said block and the bottom bar of the extension.

IMPROVED GLAZIER'S DIAMOND HOLDER.

Jacques E. Karelsen, New York city.—The object is to simplify the construction of glaziers' diamond holders in common use in such a manner that they can be made cheaper, and also so as to take up less room in the pocket. The invention consists of the breaker being secured to the handle directly and in line with the axis of the handle and of the swiveled diamond holder. The present ferrule construction is thus dispensed with.

IMPROVED TRACE BUCKLE.

Lyman D. Hubbard, Hume, N. Y., assignor to himself and Henry C. Brown, of same place.—This trace buckle is provided with a swinging tongue section provided with wedge-shaped sides, that slides in horizontal slots of the buckle frame. It is readily opened to detach the trace by pulling the same forward and swinging the lateral tongue section into open position.

IMPROVED COMBINED DRYER AND SMOKE HOUSE.

Ransom Sabin, Shelby, Mich.—This is a building made of sheet metal and angle iron, having a fireplace, and a flue running around its interior and out at the roof. It also consists in a circle provided with hooks, upon which to hang meat and other articles, and in the arrangement of swinging shelves for supporting fruit and vegetables.

IMPROVED OILER.

William H. Harrison, Livermore, Cal.—This oiler is so constructed as to catch and hold any oil that may run down the stem, while at the same time it keeps the outside of the can free from oil, and the caught oil free from dust.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED ORE SEPARATOR.

William M. Courtis, Wyandotte, Mich.—The tailings are received from the tail-race by a chute, and are projected between blocks and upon the grating with sufficient force to carry the larger particles over the end of the grating into a vertical chute. By the action of currents of water the heavier of the particles that pass through the grating fall toward the pipe leading to the settling tank, while the lighter of such particles are carried upward and discharged with the tailings.

IMPROVED RAILROAD SWITCH.

William H. Cooke, Wilton, Conn.—This switch is operated by the passing locomotive. A notched bar is connected with the movable switch rails, and a locking lever engages with notches of said bar. By means of a T lever, the locking lever is disengaged, and the notched bar and rails are moved. Levers, which are moved by the locomotive, are placed each side of and remote from the notched bar, and connected with the T lever by means of rods.

IMPROVED BOAT-DETACHING APPARATUS.

William McK. Bell, Collingwood, Ontario, Canada.—This invention consists of a detaching device applied to the boat, and made of a supporting frame with a pivoted tumbling bar and swinging tongue, locking by its toothed or serrated end to a correspondingly toothed projection or catch of the supporting plate, until the pressure on the tongue is released, and thereby the same detached.

IMPROVED TURNSTILE.

Alfred F. Swan, Hoboken, N. J.—This consists of parallel guide rails, with central pivoted side standards, having rigid horizontal arms, of which one set extends parallel to the other at an oblique angle to the longitudinal axis of the stile. The side standards and arms are revolved and locked by hinged and spring-acted platforms, which are jointly worked by the weight of the person passing through the turnstile. One platform operates the standards by ring-shaped sleeves, with pins entering spiral recesses of the same. The second platform locks the standards by recesses binding on stop pins, jointly with the first platform or singly, to prevent the return of the person.

IMPROVED MILLSTONE CURB.

William L. Taggart, Niles, Mich., assignor to himself and William R. Taggart, of same place.—This invention consists in a double walled curb for stones of flouring-mills, the inner wall being provided with openings and deflectors, which receive the air from the interior of the curb, and deliver it to the space between the double walls. Apertures are provided in the top of the curb for the admission of air between the walls of the curb. A tube that connects the space between the walls with an exhaust fan, the object being to provide efficient means for ventilating burr stones, so that the capacity of the stones may be increased and the quality of flour improved.

IMPROVED WATER WHEEL.

Andrew Jamison, Taylorstown, Pa.—This invention consists in a water wheel provided with semi-cylindrical or wedge-shaped buckets, placed in a channel in the middle parts of said wheel. Holes lead from the ring channel in said wheel at the ends of the buckets, out through the ends of the wheel. By this construction the water, as it enters the wheel, impinges upon the buckets, and by its force gives motion to the wheel. At the same time the rapid motion of the wheel keeps the buckets and holes in the lower part of the wheel full of water, so that the wheel will be driven by both the force and the weight of the water.

IMPROVED POST AND PILE DRIVER.

William A. Newton, Pappinville, Mo.—This machine is mounted on wheels so as to be moved from place to place as desired. Its standards may be adjusted into a vertical position when the surface of the ground into which the posts are to be driven is inclined. The standards also serve as ways for the hammer, which may be made in parts securely bolted together, so that its weight may be increased or diminished as required.

IMPROVED CAR COUPLING.

John B. P. Mohan, Dryden, Minn., assignor of one third his right to Thomas D. M. Mohan, of same place.—The mode of operation is as follows: The link passes into the drawhead under and against the rear of a lever, lifting the latter against the spring until its recess receives a spring bolt, which then holds the lever in a horizontal position against the tension of a spring. As soon as the shaft or key is turned sufficiently to force back the bolt, the spring forces down the rear and up the front end of the lever, thus uncoupling the cars.

IMPROVED CAR AXLE BOX.

Joseph A. Picard, North Platte, Neb.—This consists in the arrangement, on the upper side of a journal box, of a reservoir for containing oil, provided with split tubes, having screw caps for controlling the flow of oil. The said tubes communicate with a series of holes in the back of the "brass" or bearing surface of the box through grooves cut in the brass for that purpose. The device also consists in backing the said brass by a plate of iron and a heavy sheet of rubber.

IMPROVED CROSS TIE FOR RAILWAYS.

Henry S. Wilson, Fernandina, Fla.—This consists of an iron beam having wide flanges formed on its upper and lower sides, and provided with fixed and removable clips for clamping the rail flange. The advantages claimed are, that the cross tie is practically indestructible, and that a track laid upon ties of this description is more durable and less liable to accidents than those laid upon ordinary wooden ties.

IMPROVED STEAM ROCK DRILL.

Joseph C. Githens, New York city.—This rock drill is so constructed as to avoid the necessity of a large steam chest upon the outside of the steam cylinder to enable the drill to be used close to the top of the cutting. The middle part of the piston is made smaller and is surrounded with a sleeve, the space between the said middle part and the said sleeve serving as a steam chest. The steam is introduced through guide pins screwed into the opposite sides of the cylinder, the inner ends of which enter curved slots in the sides of the sleeve so that the said sleeve may be turned to admit and exhaust the steam by the longitudinal movement of the piston.

NEW AGRICULTURAL INVENTIONS.

IMPROVED BRUSH AND CANE CUTTER.

Oliver Pickering, Needham, Mass., assignor to himself and Charles E. Keith, of same place.—This consists in a ferrule provided with the three hooks, a pivoted button, and a bolt, in combination with the handle, to receive and hold the shank of the cutter. By this construction the cutter will be held securely in place while in use, and may be readily detached by removing the bolt.

IMPROVED GRAIN SEPARATOR.

Theophilus Harrison and William C. Buchanan, Belleville, Ill.—From thrashers the straw comes to the separator from six inches to three feet in depth, and the shaking packs the straw, so that it requires to be pulled apart by some instrumentality. This is accomplished by rakes mounted on crank shafts, so that they are alternately oscillated and carried forward over the straw, then down into it and back with it, thus pulling apart the straw at the point of juncture of the sections of the shaker.

IMPROVED CRANBERRY SEPARATOR.

Joseph C. Hinchman, Medford, N. J.—In using this machine, as the berries drop through the space between boards they strike the forward part of the upper side of an upper roller, and the perfect berries bound over the upper edge of the inclined board and pass down from one to another of the boards until they are received in a box placed beneath the forward lower part of the case. The perfect berries that were prevented from bounding, and those that struck against the inner side of the board, pass down between another set of boards to the next roller, where the same operation is repeated, and so on to the last, when the bad berries drop into a suitable receptacle.

NEW HOUSEHOLD INVENTIONS.

IMPROVED LAMP BURNER.

Charles A. Ferron, Paris, France, assignor to George R. Tuttle, New York city.—This consists of an interior fixed, and an exterior detachable, guide tube for the wick, to which the air is supplied from the outside through the base of the dome, and the inside through a radial air channel of the conical base, arranged around the stem of the wick-adjusting spur wheels. The wick is evenly adjusted by intermeshing double spur wheels in connection with flat side springs of the base part. The upper part of the wick is closed, while the lower part is open, the closed part being arrested in its downward motion by a radial top plate or partition of the base section. The chimney, globe, and dome holder are supported on a collar of the base section, and by a guide ring on the outer wick tube.

IMPROVED LINE FASTENER.

Andrew S. Goodrich, New York city, assignor to himself and Henry Goodrich, of same place.—This invention consists of a clothes-line supporter consisting of a supporting plate, which is attached to the window casing outside of the lower sash, and provided with a fixed horizontal arm, carrying an upright standard and outer hook. On the inclined collar of the standard swings a lever arm that supports the pulley line, the arm being, at the end swinging on the post, inclined in similar manner as the collar, and secured by set-screw in inward or outward position thereon.

IMPROVED SPICE BOX.

Orvill M. Brock, Monroeton, Pa.—This consists in the combination of a pepper box and salt cellar, the latter being screwed on or otherwise attached to the former, so that it may be readily detached when salt is used.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED SHEET METAL ROOFING.

Henry W. Smith, Waynesburg, O., assignor to himself and Thomas C. Snyder, of same place.—This consists in the use of flanged sheets and anchors. The roofing is held securely without driving nails through the sheets of metal composing the same. The peculiar form of the seam permits of expansion or contraction without injury to the roof.

IMPROVED MACHINE FOR PLANING WOOD.

Frederic Godeau, Paris, France, assignor to Pierre Ferdinand Arbey, of same place.—The knife rests on the front bearing or cheek of a lower plate. The top plate bears by its front part or face on the knife, and is curved to be raised a short distance above the main part of the knife for the same purpose of leaving the knife free of pressure at the rear part. The lower plate is secured by fastening screws passing down through the plate into the cutter-head, or from below, through the cutter-head, into the plate. The top plate is secured to the cutter-head by fastening screws near the center of the plate, or to the lower plate, as described. For the purpose of sharpening the cutting knives a grinding attachment is arranged at the top of the frame. The side plates of the frame carry a lateral revolving shaft, on which is placed a laterally sliding but axially revolving emery wheel, that is adjusted to the knife to be sharpened by means of a hand lever, connected with suitable mechanism. By moving the lever handle to either side, the ready following of the revolving emery wheel is caused.

NEW TEXTILE INVENTION.

IMPROVED SHUTTLE BOX LOOM.

James Hyde, Stottville, N. Y.—This is an improved fancy loom, so constructed that it may be run at greater speed and at less expense than ordinary fancy looms; and that may be worked without pickers or spindles. The construction cannot be explained without the aid of detailed drawings. It is, however, exceedingly ingenious, and forms an improvement in weaving which is well worthy of careful examination.