

THE CONVEYANCE OF DISPATCHES BY BEES.

Let not our readers think of a hoax on reading the title of this article. It is a question entirely of asking a new service of the bee—that insect so useful in the country; and it is desired, neither more nor less, to obtain, after it has contributed to increase the national wealth in time of peace, its aid in the common defense when the country shall be threatened. But, what! it will be said, you do not think seriously of replacing the carrier pigeon, which travels immense distances in order to regain its cote, and with a speed equal to, and often greater than, that of our fastest trains, by an insect incapable of guiding itself if the hand of man or the force of the wind carries it to some leagues from its hive, and whose qualities of speed bear no comparison with those of the winged messenger that is called upon to render so great services in time of war. Do not be uneasy, for such is not our thought, and we do not believe, even, it is that of Mr. Teynac, the distinguished bee master of the Gironde, who has conceived the idea of this ingenious innovation. It is a question, for the moment at least, only of some curious and interesting experiments, which are insufficient, however, to permit of prejudging of the services that this new mode of transmitting correspondence may render in the future. However this may be, the results obtained up to the

present by the author of this method are so remarkable that we do not fear to lay them before our readers, being certain that they will think, as we do, that we have here the elements of a most interesting study. Numerous experiments, not altogether new, have established the fact irrefutably that, if a swarm of bees be inclosed in a bag and carried to a distance of less than two or three miles from the hive, and the bag then be opened, the bees, after whirling around for a few instants, will quickly take flight in the direction of the hive with that certainty of instinct with which nature seems to have endowed all animals to a greater or less degree. The most active ones will cover the distance within a length of time varying between twenty and twenty-five minutes, which corresponds to a mean speed of seven miles per hour. It was starting from this fact that Mr. Teynac conceived the idea of utilizing the instinct that leads the bee to its home for making a messenger of it, and that he constructed the material represented in our engravings, and the use of which we shall explain.

Let us suppose that the owner of a swarm wishes to establish a system of correspondence with a friend whose residence is 2 or 2½ miles distant from his own. He begins by sending him a small hive constructed as shown in Fig. 1, and well stocked with bees and with food for them. At the end of a few days, the bees will be sufficiently accustomed to their new surroundings to allow experiments to be begun. A certain number of bees are taken from each hive and introduced into a small shipping box (Fig. 2). The greater part of the top of this box is covered with wire gauze, which permits of the entrance of air to the prisoners. The bees are introduced through the orifice, 4, that may be seen to the left of the box, and which is afterward closed by the pivoting cover, 2. In this way, the sending may be easily done by mail. On reaching their destination, the bees are set free in a room in which a saucer containing a little honey has been arranged upon a table. The bee alights on the repast, and this is the moment that the operator must take advantage of to glue to its thorax the previously prepared dispatch. As may be seen in Fig. 3, the extremity of the dispatch (here magnified ten times) is slit with a pair of scissors so as to form two flaps, which are covered with fish glue

and quickly applied to the bee held with pinchers. Care must be taken that the glue does not touch either the head or the wings of the insect, which, as soon as it is satiated, takes its flight and steers straight for its hive. But here it meets with an unexpected obstacle. In fact, care has been taken to place before the entrance of each hive a small tin box having apertures in front of just sufficient size to allow of the passage of the males or drones. The opposite side, which is

senger which, through patient training and proper selection, might be able to travel greater distances. It is toward this point that the researches of Mr. Teynac are being directed, and he is now experimenting with the *Bombus hortorum*, domesticated by him.—*Les Inventions Nouvelles*.

English Walnuts.

Mr. P. L. Simmonds contributes to a recent issue of the *Gardeners' Chronicle* some interesting information about the so-called English walnuts, from which the following facts are gathered:

There are many varieties of these nuts, such as the oval, round, double, large and small fruited, early and late, tender thin-shelled and hard thick-shelled. An almost huskless variety occurs in the north of China. The larger portion of the walnuts consumed in England are of foreign growth, and average in quantity about 250,000 bushels. The bulk of these come from France and Belgium, and small quantities from Germany, Holland and Italy.

Bordeaux is one of the largest exporting ports in the world, perhaps the largest for walnuts; and small quantities are now sent from Chili to Europe. The culture of the so-called English walnut, which, by the way, is not an English tree at all, but a native of the Orient and of central and eastern Asia, from

whence it was early introduced into Europe, is now diffused over Italy, from the Alps to the valleys of Sicily. It is thought, however, that the number of cultivated walnut trees in Italy is diminishing, as the demand for the timber is increasing, being in great demand by the cabinet maker.

Persons with weak digestions will do well to bear in mind Mr. Simmonds' warning that walnuts, as long as the skin can be easily removed from them, are a nutritious and healthy article of diet; but when they become dry, so that they cannot be easily peeled, they are indigestible.

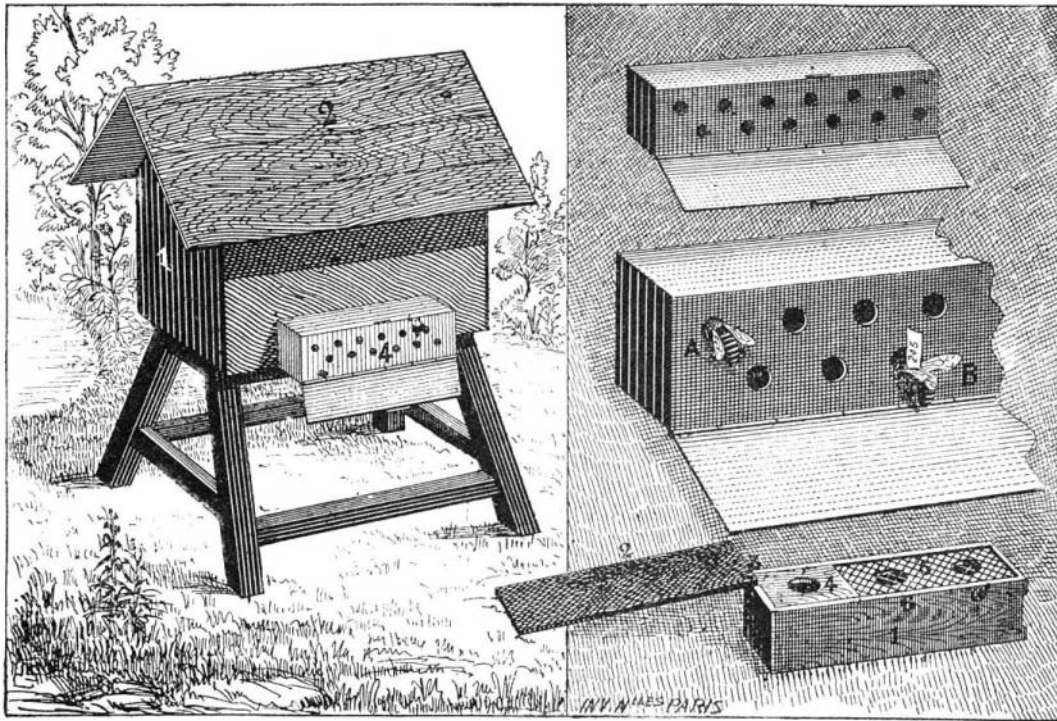
Walnuts in the shell yield about one-third their weight of picked kernels, which are the crumpled cotyledons or seed leaves. In some northern districts, particularly in Piedmont, walnut trees have always been held in high estimation for the production of oil, which, when newly made, has a very agreeable taste, and can be employed in cookery as well as in the preparation of varnish.

The walnut grows abundantly in Kashmir, Nepal and other parts of India, where the fruits are largely used. It forms also an important article of consumption in Japan, quantities being eaten in a raw state. They are also much used for making a kind of confection, by cracking and removing the shell without hurting the kernel, which is afterward coated with white sugar, thus making an attractive and agreeable sweetmeat.

The walnut also furnishes in Japan a bland oil, used for domestic purposes. In China it seems to be pressed for oil, as in some years over 12,000 tons are exported from the port of Tientsin in the year. The walnut is extensively cultivated in the Punjab, among the Himalayas and in Afghanistan, a large annual

supply being brought to the plains of India by the Kabuli and other traders from the hills. There are several well known forms of this nut met with, the soft-shelled kind of Kashmir and Chamba being considered the best.

THE picturesque American term "monkey wrench," used to describe an adjustable wrench that seizes the nut on two sides, seems to be unknown in England. There the wrench is called a spanner, because it spans the nut.



Figs. 1 and 2.—HIVE AND SHIPPING BOX.

entirely open, is applied exactly against the entrance to the hive, so that, in order to enter or make their exit, all the bees are obliged to pass through these apertures. The little messenger, hampered by the protuberance that the dispatch forms upon its back, exhausts itself in vain efforts to pass through in its turn, and is obliged to wait for some one to free it from the burden that prevents it from entering the hive.

Here, then, is the system of correspondence devised by Mr. Teynac. It will be seen that the use of it is as yet not very practical. The difficulty resides in the small extent of the field of operations of the same swarm, and this would, for transmission to a long distance, necessitate a multitude of intermediate stations two or three miles apart. It is true that the establish-

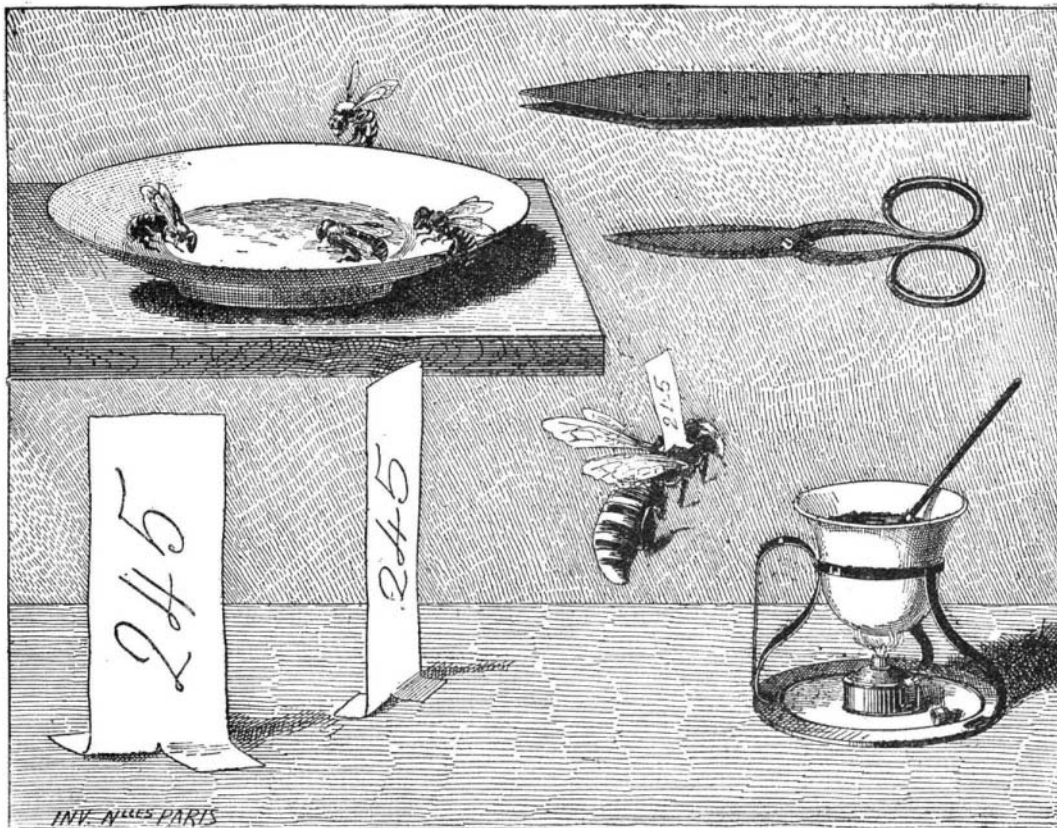


Fig. 3.—SAUCER OF HONEY PINCHERS, SCISSORS, DISPATCHES, GLUE POT, AND BEE WITH DISPATCH AFFIXED.

ment of such stations is neither difficult nor costly, since there is no need, as with the other messengers, to trouble one's self with the question of feeding, but, on the contrary, each station would be a source of revenue to its guardian. But, in most cases, for a besieged city, the establishment of a station at a distance of two miles is so evident an impossibility that it is not necessary to dwell upon this point. Moreover, relays so close together would occasion great losses of time. It remains to be seen whether in the immense family of hymenoptera there may not be found a mes-

Improvement in the Manufacture of Ultramarine.

R. W. E. McIvor has found the following proportions of raw materials to yield excellent results: Sodium sulphide, 42 lb.; sulphur, 20 lb.; kaolin (China clay), 110 lb.; soda (as carbonate), 106 lb.; or caustic soda, 40 lb. These quantities yield about 2 cwt. of ultramarine blue. The clay and soda are first roasted together at a red heat so as to effect partial double decomposition, and the product is ground. "Sulphur liquor" is then made by dissolving flowers of sulphur in a solution of sulphide of sodium to saturation. The ground material is then made into a thick paste with the sulphur liquor, the paste dried in an oven, and the dried mass broken into small pieces is roasted without access of air in a closed earthenware retort first at 250° to 300° C. for an hour, then at a red heat for eight hours, and finally just below dull redness in presence of a slow regulated current of air. The retort must be quite cold before being opened.

Sugar.

The States now producing sugar and the raw material from which they produce such sugar are as follows:

California.....	Beets.
Utah.....	Beets.
Nebraska.....	Beets.
Pennsylvania.....	Beets and maple sap.
Virginia.....	Beets.
Texas.....	Sugar cane.
Louisiana.....	Sugar cane.
Florida.....	Sugar cane.
Kansas.....	Sorghum.
Missouri.....	Sorghum.
Minnesota.....	Sorghum and maple sap.
Michigan.....	Sorghum and maple sap.
Iowa.....	Maple sap.
Wisconsin.....	Maple sap.
Illinois.....	Maple sap.
Ohio.....	Maple sap.
West Virginia.....	Maple sap.
New York.....	Maple sap.
Maryland.....	Maple sap.
Massachusetts.....	Maple sap.
Vermont.....	Maple sap.
New Hampshire.....	Maple sap.
Maine.....	Maple sap.

A PULVERIZING HARROW AND CULTIVATOR.

The improvement shown in the illustration is designed to form a perfect pulverizer, doing the work of a harrow clod crusher and roller combined, while it prepares a perfect seed bed, deep, fine, smooth, and even as a floor, and cleans foul fields of weeds and vines so that they may be plowed under without trouble, the plow not being required at all in many cases. The forward frame of the machine, which carries the pulverizers, is connected by a pole with the axle of a wheeled carriage, and the frame has a series of inclined drag bars, adapting it, when the pulverizer blades are removed, to the smoothing of lawns, roadbeds, etc. The pulverizer blades are preferably of steel, and are attached to a head stock, as shown in the small views, two upwardly extending studs of the stock passing through perforations in the drag bars, to which they are secured by pins or keys. One of the paired cutter blades crosses the path of the other, and presents an acute angle to the ground surface, designed to cut through it readily, and ride upon or cut off small roots, vines, stalks, or similar obstructions, or bury them in the soil, while the shape of the blades is such that the entire device will ride over a rigid obstacle. The edges of the blades are beveled on the outside, to render themselves sharpening as they are drawn through the soil. Extending rearwardly from the wheeled carriage are rods carrying drags, by which the marks made by the wheels are covered. The machine can be taken apart and put together, or changed from one combination to another, without the use of a tool or the exercise of any degree of mechanical skill. It is designed to be inexpensive to manufacture, and not likely to get out of order with severe use, while it can be readily taken apart and packed, except the wheels, in a box about six feet long by ten inches square.

This improvement forms the subject of two patents issued to Mr. John P. L'Homedieu, of Setauket, Suffolk County, N. Y., to whom application may be made for further particulars.

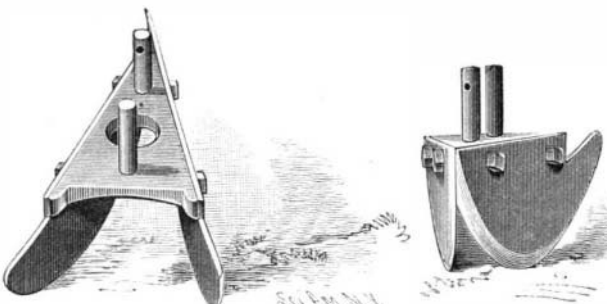
A SEAT ATTACHMENT FOR BICYCLES.

The illustration represents an extra seat attachment for bicycles, which may be readily put on or removed, adapting the vehicle to hold a child in front of the rider in such a manner that it cannot fall out and will not unbalance the machine, while it may also be adjusted to suit children of different sizes. This im-



RASTETTER & SIEBOLD'S BICYCLE SEAT.

provement has been patented by Messrs. Louis Rastetter and Crist Siebold, of Fort Wayne, Ind. The child's seat may be placed on any common form of bicycle, being shown attached to a safety of the usual style, and it is supported at the back by the spring of the main seat, a cleat passed through the front coil of the spring being secured to the back of the attached seat, from the lower front portion of which braces extend downward and forward, and are bolted to a support secured to the steering fork and the main frame. Fig. 2 is a plan view of the attached seat and its supports, the foot rests extending in a nearly horizontal position on each side of the fork, and the rear portions of



the foot rests being bent upward and clamped to depending hangers, the clamp being adjustable to suit children of different sizes. The handle bar extends around the front of the seat, forming a secure guard to prevent the child from falling out, and when the

The Physical Action of Odors.

The direct action of odors on the nervous centers is a subject worthy of careful research and study. Goethe had a strong dislike to the odor of apples; Schiller liked the odor. Some persons are made absolutely ill by the odor of onions that are being cooked; while other persons rather like it. The odor of the lily has a most potent effect in many instances, and I believe there is no person on whom it does not produce a sense of depression and nausea. I have known it cause positive faintness. I am myself always disagreeably affected by the odor of carbolic acid, and can never remain many minutes in a room where a trace of it prevails. In cases where the effect of an odor is instantaneous, it is fair to suppose that the impression made on the olfactory surface is transmitted direct to the olfactory center of the brain; but there must also, in certain examples, be a further transmission to the sympathetic ganglia.

The central seat of the olfactory sense must be very near to the central seat of memory, for it is noticeable that nothing recalls a past event like an odor. A little child was accidentally thrown out of a pony-carriage in a country lane. Near the spot where the fall took place there was a manure heap, which gave forth the peculiar dry ammoniacal odor so often recognizable from such heaps—an odor distinctive yet not altogether unpleasant. The child was stunned by the fall, and on recovering and returning to consciousness smelt this odor powerfully. Over fifty years have elapsed since that little mishap, and yet whenever the person referred to passes, in country lanes, a heap giving out the same odor, the whole scene of the accident recurs with every detail perfect, and sometimes with a recurrence of the giddiness and nausea which were experienced at the moment.

In some of the lower animals memory by odors is often singularly exhibited. In the dog the memory by odor seems a special part of the nature of the animal. The "scent" of the fox-hound and of the stag-hound is of this character. In the trained collie the remembrance of an object hidden, a stick, for instance, may be retained for three quarters of an hour, so perfectly that the animal will fetch the object at command. But if the object be coated with something giving an odor which the animal is familiar with, the time is infinitely more prolonged.

Some odors lead to sleep, like the odor from dried hops; others lead to wakefulness, like the odor of dead flowers or leaves. Still others allow sleep but provoke the most terrible dreams, like the odors arising from a pillow in which feathers are decomposing.

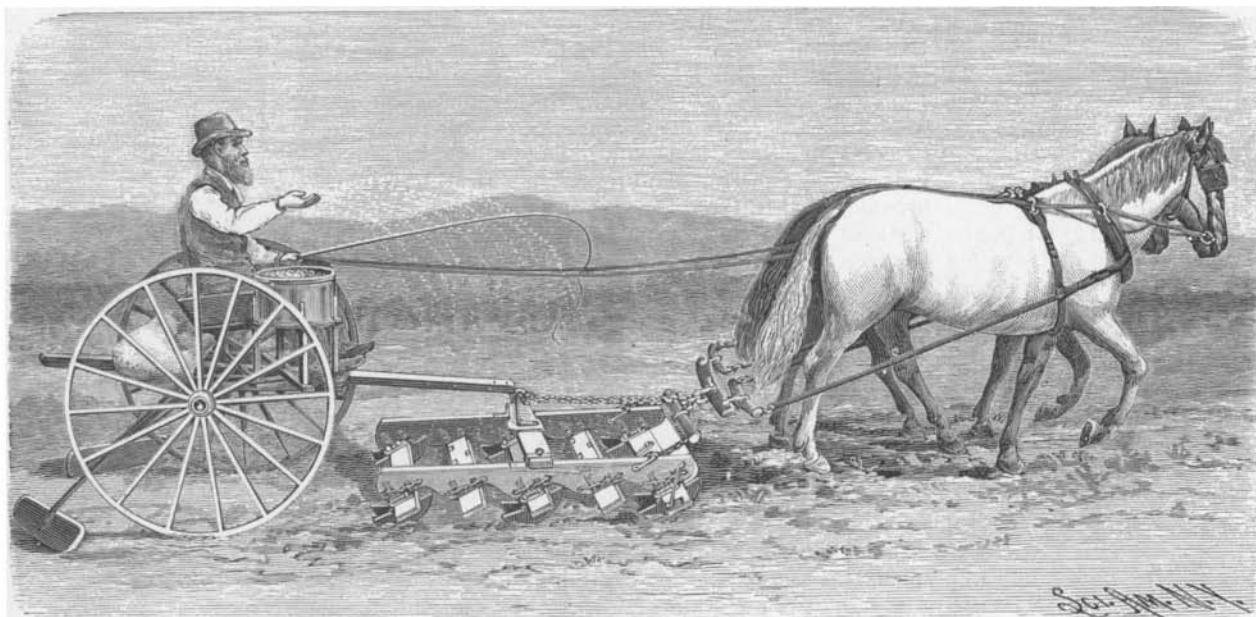
Habit modifies the effects of odor. Merciless smokers laugh at the "faddery" of women who become faint if a smoker charges the air they breathe in a confined space, a small room or a railway carriage, and are ready to compare the objection of a lady unaccustomed to the odor from the pipe or cigar with the carelessness on the matter shown by another lady who has become accustomed to the effect. But if a smoker gives up smoking and all contact with smoke for a few years, he is astounded at the unpleasantness of an air charged with smoke when he is then inclosed in it. I was once summoned, professionally, to a youth who was temporarily poisoned by inhaling the atmosphere issuing out of a small window of a clubroom in which a number of men were smoking freely. They, in the body of the smoke, were not perceptibly affected. He, partly

in the open air, was positively smitten to faintness by the empoisoned current from the room which flowed out of the window, and is still affected whenever he comes within the cloud of a pipe.—Dr. B. W. Richardson, in the *Asclepiad*

To Remove Rust.

To remove rust from iron or steel utensils the following solution is applied by means of a brush, after having removed any grease by rubbing with a clean dry cloth: 100 gm. stannic chloride are dissolved in 1 liter of water; this solution is next

added to one containing 2.5 gm. tartaric acid dissolved in 1 liter of water, and, finally, added 20 c.c. indigo solution diluted with two liters of water. After allowing the solution to act for a few seconds, it is rubbed clean with first a moist cloth, later with a dry cloth; to restore the polish, use is made of silver sand and jewelers' rouge.



L'HOMEDIEU'S CULTIVATOR AND PULVERIZING ATTACHMENT FOR HARROWS.

child is not to ride the seat may be easily removed and the bicycle used in the ordinary way. By this method of attaching the seat, the child has a foot on each side of the fork, and has the same swinging motion as the operator, the weight of both coming together upon the saddle, whereby the child fully partakes in the healthfulness of this form of exercise.