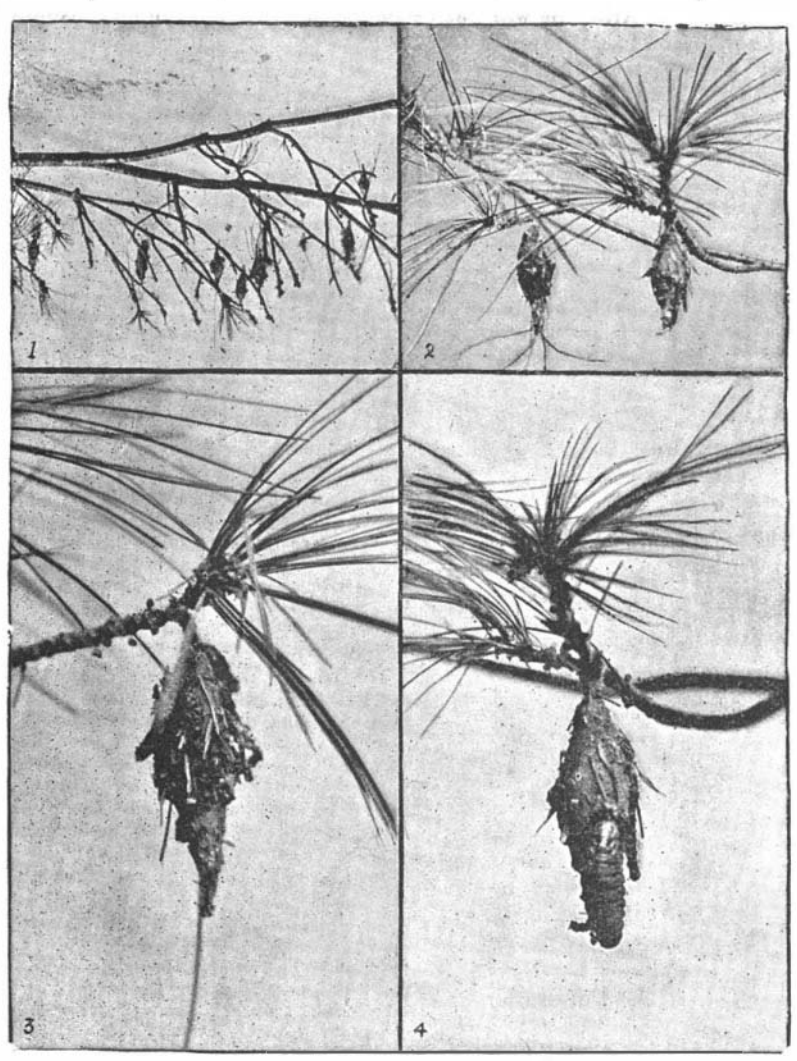
PINE CONES, OR COCOONS?

It is a well established fact that certain animals imitate the forms, colors and even the actions of other animals for the purpose of protection. Some animals carry this imitative instinct into the construction of their nests, burrows or cocoons. In no instance is this faculty carried to such an extent as in the cocoon of the pine tree moth. The *larva* of this moth spins its cocoon in the pine tree only, and builds it in exact imitation of the young pine cone or bud. This imitation is wonderfully like the genuine cone, and often deceives observers, unless they are exceptionally critical or are looking for the cocoons. I have carefully followed this moth through its metamorphoses from *larva* to *imago*. The female resembles the female of the common vaporer moth, and belongs to a kindred family, with habits, however, markedly different. I have reared only one female from the grub, a perfect and very beautiful specimen. She commenced oviposition the day after her extrusion from the cocoon, and was unfortunately crushed beneath a book which accidentally fell on her, before I had sketched or photographed her. This was the only *imago* of this moth that I have ever seen, although I have watched for it ever since my attention was called to it, two years ago. Judging from the care it takes to avoid notice, this *larva* must be a tidbit in the bills of fare of insectivorous animals. I had long been familiar with the grub, but had confounded it with the *larva* of a non-edible moth belonging to the *Liparidae*, which it closely resembles and probably imitates.

Its favorite food is couch or dog grass (*Triticum repens*) and kindred grasses, and it does not begin feeding until late in the evening, thus avoiding the attacks of birds. It hides during the day among the closely matted roots of the grass. About the last week in August it abandons its usual feeding grounds, and resorts to pine trees, where it feeds on the pine needles for two or three days. It then begins the construction of its cocoon. When this is about two-thirds completed, it protrudes its head and front pairs of legs and crawls about, dragging the cocoon with it, in search of small bits of twigs and pieces of bark. This it does at night, for this little creature rarely moves for any purpose during daylight. It never entirely leaves the cocoon, but extends its head and body as far as possible in its search for proper materials. The bits of twigs and bark are arranged in rows around the cocoon, and are always parallel with its axis. When this outside decoratio is finished it proceeds to a terminal twig and suspends its cocoon at the base of a bunch of needles, exactly where, in the course of nature, a cone would make its appearance. It then goes to feeding again, reaching out and drawing down the needles, at the base of which it hangs suspended. Every now and then it affixes a pine needle to the outside of the cocoon.

It feeds for four or five days, then closes the orifice of the cocoon and becomes a *pupa*. The time occupied in the construction of the cocoon, from the start to the finish, is about eight days. Before the *larva* suspends the cocoon to a terminal twig, and while it is engaged in applying the bits of bark, etc., to its outside, always during daylight, it seeks a bunch of needles and remains perfectly quiet until dusk. After the cocoon has been suspended, and if it is surprised by daylight while feeding, the grub withdraws into the cocoon and does not appear again until darkness falls. The bits of twigs and pine needles are not incorporated into the structure of the cocoon, but are applied outside on the surface; the twigs simulating the dark edged *laminae* of the young pine cone, and the fringe of needles, the needles growing from its base and apex. The needles have been stripped from one of the branches photographed, so that the cocoons and a belated cone might be clearly shown. It will take an acute eye to discriminate between the imitators and the imitated. At the distance of eight or ten feet it is almost impossible to distinguish the difference, and the uninitiated always insist that the cocoons are pine cones until they learn their mistake by a more thorough examination. I have removed a *larva* from a cocoon, and show it in one of the photographs. Metamorphosis has already commenced in the anal extremity of the grub. It has lost its posterior pairs of legs, and its body has become slightly flattened. The anterior portion remains unchanged; the *larva* was still feeding when it was removed, and was not yet ready to close the orifice and become a *pupa*. The *pupa* state is the most helpless of all the metamorphic stages through which this animal passes; consequently this creature needs protection more in this state than in any other; hence the mimicry of the young pine cone or bud which appears in the spring just at the time when the *pupa* is most helpless. Of course, when the cocoon is brought close to the eye, it loses its resemblance to the pine cone in all save shape. Seen among the thick pine needles and branches, it completely mimics the pendent cones, and deceives the most practiced eye.

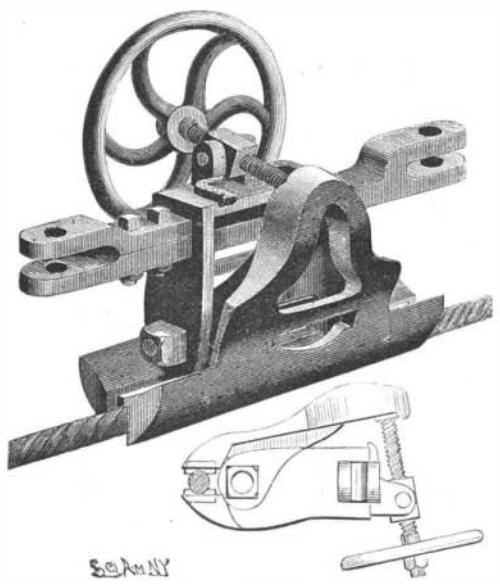
JAS. WEIR, JR.



1. COCOONS AND PINE CONE. 2. FINISHED COCOON AND ONE NEARLY SO. 3. OUTSIDE DECORATION. 4. LARVA AND COCOON.

A CABLE GRIP FOR COAL CARS OR MINE WAGONS.

This is an exceedingly strong, simple, easily operated device, which may be used as a coupling as well as a grip, the grip clasping the cable from the sides in such manner as not to bend or weaken it. The improvement has been patented by Mr. A. N. Humphreys, General Superintendent of the Westmoreland Coal Company, Irwin, Pa. In the small figure an end view of the device is shown, with the cable in cross section. The grip frame is widened at its lower end to form a jaw, and pivoted thereto is a swinging arm or plate having at its lower end the other jaw, each jaw being provided with a shoe held in place by rivets. On the top of the grip frame are bearing blocks in which is held a nut through which extends a screw shaft, one end of which is held in a socket in the upper end of the swinging grip arm, while the other end of the shaft has a hand wheel, by turning which the grip may be clamped upon or released from the cable. The grip frame is carried by a rectangular coupling bar having in each head a horizontal slot or mouth adapted to fit on the drawbar of one of the cars or wagons, the upper half of one of the heads being formed by a detachable plate. The grip thus becomes a coupler of two cars or wagons, and connects both cars or any number of coupled cars to a moving cable.



HUMPHREYS' CABLE GRIP.

Improved Brakes.

We learn from the *Railroad Gazette* that the Pennsylvania Railroad will shortly have all passenger cars equipped with the quick-action brake, and the locomotives equipped with the automatic engineer's valve. The process of changing from plain automatic to the quick-action brake has been going on for some time. The large number of cars and engines to be changed has necessarily delayed the matter until the present time. This shows the way in which brake matters are drifting, namely, toward the most powerful quick-acting and efficient brake that can be obtained for passenger service. Perhaps this turn in brake matters is emphasized by the investigation now being made into the efficiency of reinforced brakes. The reinforced brake has been brought out to do better work and more powerful braking than can be obtained from a quick-acting brake. It is found that in face of danger the length of stop, even with the quick-acting brake, is so great as to result in accidents, more particularly collisions. The reinforced brake is an improvement on the quick-acting brake; it does not make the brake act quicker; it makes it more powerful during the first part of the application, while the train is running at a high speed. The reinforcement comes during the early part of the application, and is reduced as the speed reduces, in order to prevent sliding the wheels. This reduction is also necessary in order that the maximum braking efficiency may be obtained, for the reason that if brakes were applied with the reinforced pressure at low speed the wheels would slide, and when the wheels do slide the retarding force is greatly decreased. There can be no doubt of the necessity of using quick-action brakes wherever possible and the reinforced brake for all high-speed trains; and it would appear, from present indications, that in the future it will be as necessary to use the reinforced quick-acting brake as an improvement on the plain quick-acting brake as it now is necessary to use the latter in the place of the plain automatic.

Do the Sick Ever Sneeze?

For somwhat over twelve months the readers of medical literature have been confronted in small caps with the conundrum: "Do the Sick Ever Sneeze?" We do not know why this inquiry has become so popular; no prize has been attached to its proper answer; in fact, comments and replies are not even solicited. But the simple query has been traveling around from Sheffield and London to Texas, Oregon, and Philadelphia, and it has not been answered yet. There are some problems which the human mind shrinks from grappling, sometimes because they are too deep and too consuming, or again because we dread the consequences of an awful certainty. No medical man has yet dared to come out squarely and say in so many words that the sick do or do not sneeze; and the world is curious to know whether this is due to fear or incompetency; or is it that doctors simply do not know? Perhaps despite the fact that this question—which was first thrown upon the world by Mr. Jonathan Hutchinson, the greatest living authority on a number of things—we say despite the fact that this question has been so continually pressed home to students of medical science, it may not yet have made the impression it ought. There is a deal of flippancy in the world, and some may have said on reading the inquiry, supposing the sick do sneeze, or do not, what the dickens is the odds? Well, we shall still have cakes and ale irrespective of sternutation, but science exists for the purpose of adding to the eternal verities; hence the question of sneezing must be dealt with seriously and answered in accordance with the illumination furnished by thorough and matured knowledge. It cannot be lightly thrust away by appealing to points of economics.

We are aware that collective investigation is a little out of fashion, but here is an opportunity for fruitful work, and we should like to have our readers lay aside mental indolence and address themselves boldly to Mr. Hutchinson's problem in hyperkinetics: "Do the Sick Ever Sneeze?" The eminent author himself has never seen a sick man sneeze; on the other hand, we venture to say that we have never seen a man sneeze who thought he was perfectly well. Between these wide ranges of experience there lie rich fields, fructifying study.—*Medical Record.*

ONE thousand rose trees are ordinarily required to supply two ounces of attar of roses.