

ered domes may be used with profit to any convenient number, but, on account of size, the inventor prefers to put only three in the friction still. In its present form the still is capable of producing thirty pints of distilled water in twenty-four hours, sufficient, he thinks, for any small boat's crew. Salt will not, we are informed, appear deposited if the machine is used properly, or unless all in the boiler or in the domes is vaporized to dryness.

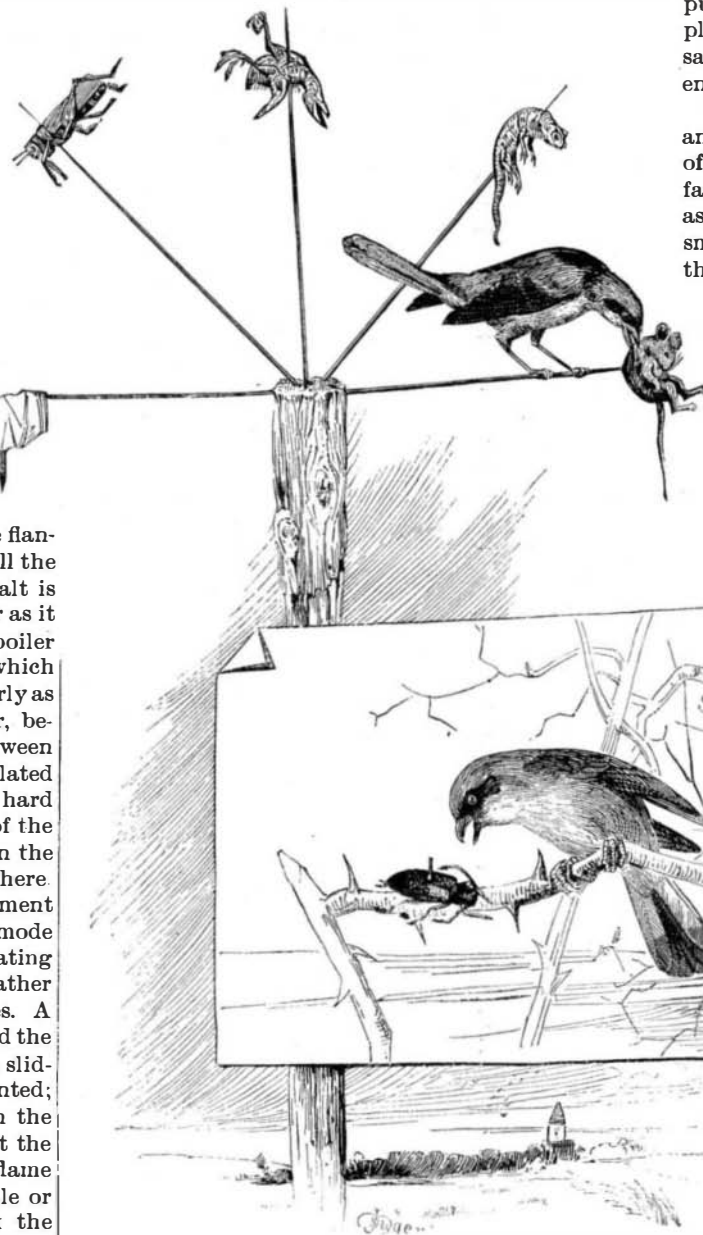
Should this occur—and it must occur many times before sufficient salt is incrustated to cause any serious loss of heat—it can be got at by throwing the top open and releasing the overflow tank. The domes are cleansed by allowing a quantity of water to flow over them when not at work. The inventor explains the non-appearance of salt in the boiler and on the flannels by saying that, in the case of the flannels, all the water fed to them is not vaporized; thus the salt is kept in solution, and is carried off in the water as it runs to waste or to the overflow tank. The boiler does not show any because of the overflow tank, which is always wasting water, and its water being nearly as heavily charged with salt as that of the boiler, because a certain amount of circulation goes on between them; so the salt is kept at an equilibrium, regulated by the salt carried away in the overflow. The hard salt that does appear is only found on the outside of the overflow tank, T. T. So long as the evaporation in the boiler is not allowed to empty it, no salt appears there.

Fig. 1 of our engravings shows another arrangement by the same inventor for utilizing friction as a mode of heat. As this is not like the still—a thing treating of life and death—he has thought fit to make it rather fantastic, and his design carries us back many ages. A single casting, taking a snake-like configuration and the necessary course, forms the whole of the frame; a sliding box carries the wood in which the boiler is mounted; the spindle of friction wheel has one bearing in the mouth of the creature and another in the frame at the opposite side of the friction wheel; the radiating flame piece or wheel boss is in one piece with the spindle or is fixed thereto, the purpose of it being to fix the wooden wheel; an ordinary handle and bolts complete the machine, the boilers for which may have various sizes or shapes, according to purpose.

The inventor devised it as specially suitable for lectures on physics, for use in magazines where fire is not allowed, or for heating shaving water, where half a minute's vigorous work every morning serves the purpose of providing a little hot water for this purpose, waking the shaver up, and providing him with exercise which is better now than in July.



BOARD AND PAMPHLETS PERFORATED BY THE TERMES FLAVIPES.



FEATHERED BUTCHERS.

THE TERMES FLAVIPES.

We received some time ago, from Mr. Joseph Eichbaum, of Pittsburg, a pamphlet which had been curiously eaten away by a small boring insect. The pile containing the pamphlet stood on a half inch board, and was about three feet high. Both board and pamphlets had been completely penetrated as represented in our engraving. Mr. Eichbaum found a small white worm, to which he was inclined to attribute the injury. After examining the result of its work, however, Professor C. V. Riley, the Government Entomologist, decided that it was due to the activity of that mischievous pest of the libraries, the white ant. He describes it as follows:

"The pamphlet perforated with numerous round, or oval, or oblong holes, or even with long branching slits, admirably illustrates the work of one of the most dangerous insect enemies to libraries and stored paper. This is the notorious white ant (*Termes flavipes*), which has received its popular name from its external resemblance to our commoner ants, as well as from its somewhat similar mode of life, *i. e.* congregating in large, well organized colonies. Otherwise, the white ants have no relation to the true ants, the former belonging to the order Neuroptera, the latter to the Hymenoptera. The colonies of *Termes flavipes*, the only species of white ant occurring in North America east of the Rocky Mountains, are to be found in the ground under large stones, or within old stumps or roots, but never exposed to the light. As the food of these insects consists of dry vegetable fiber, their work in the field proves beneficial by hastening the decay and crumbling of old logs, etc.; but, unfortunately, these insects also destroy fence posts and fence boards, enter our houses, and stealthily weaken the beams and rafters. But, above all, they prefer to attack rows of old leather bound books or piled up paper, working through covers and pages in the manner illustrated by the pamphlet sent by Mr. Eichbaum. As the white ants never come to the surface, but always work in the interior of woodwork or within books, the mischief done by them is usually not observed until the destruction is complete, and herein lies the great danger from these insects. Thus quite a number of instances are on record where in public or private libraries large rows of valuable books or documents were found to be utterly destroyed by the white ants before their presence was suspected.

"In the Southern States, and especially in tropical countries, the white ants are much more numerous and their inroads into houses more frequent than in the North, so that in some places it is only possible by incessant watchfulness to preserve and protect the

public records. Books kept in rather damp and dark places are more exposed to this danger, but perfect safety can only be secured in buildings constructed entirely of stone and iron.

"If we examine the individuals of a colony of white ants, we find among them the same wonderful variety of forms as exhibited in honey bees or true ants. By far the most numerous class are the workers, which are asexual, wingless, yellowish white, the head being small, rounded, and the jaws very minute; then come the soldiers, with immense head and jaws, and then the large females."

FEATHERED BUTCHERS.

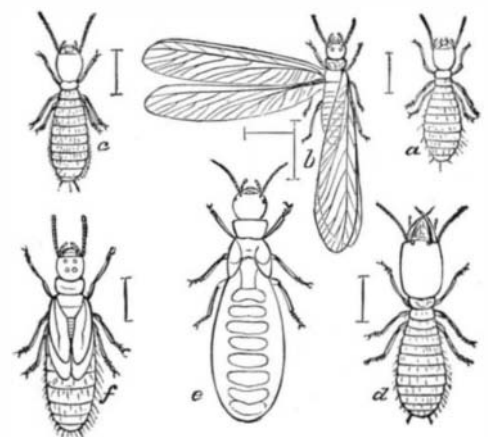
The name butcher bird, that is often given to the family *Laniada*, or shrikes, is not misapplied, as they are quite equal to the hawks and other predatory birds in their courage and the cruelty in which they seem to delight. They have a wide geographical distribution. In southern California they are particularly common, and at the time of writing, Dec. 17, in Los Angeles County, they are to be seen upon almost any tree, where they sit motionless, awaiting the approach of their prey, which is of a most varied character.

The shrikes are powerful birds, of attractive mien, presenting an appearance indicative of courage. In many the upper mandible is arched and hooked, forming a powerful weapon with which to tear and lacerate their prey. The adults attain nearly the size of a robin.

It is, however, the habits of the bird that are the most interesting, and the term butcher is applied perhaps from the fact of their impaling their victims. In California they catch a large variety of lizards, including the horned toad, mice, and kangaroo rats, and one has been seen flying laboriously, carrying a blue jay quite as large, if not larger, than itself. As a rule, game thus captured is taken to some favorite spot and impaled or hung up, and then torn apart, so that in a locality frequented by these birds quite a museum is often found, composed of the dried remains of various animals, the dismembered parts, bits of bone, and

other material. In southern California the orange tree offers every inducement to these butchers, the thorns with which the branches are armed being used for this singular purpose of laceration. Sitting perfectly immovable on a twig, the bird suddenly espies a horned toad or lizard, and darting down, before the frightened animal can bury itself or seek shelter, it is seized in the powerful beak and borne struggling to the place of execution. At first the victim is often held down with one claw, after the manner practiced by hawks, and so torn and lacerated; but generally a sharp thorn or a pointed twig is selected, and the body forced against it until it is firmly impaled. This having been accomplished successfully, the body is sometimes left, as often the capture is seemingly made in wanton pleasure, for the mere sake of killing; the victim left disemboweled—a grim warning to others.

When the butcher is disposed to devour its game, the thorn is used to help tear it apart, the flesh being



TERMES FLAVIPES.

a, larva; b, winged male; c, worker; d, soldier; e, large female; f, pupa. (After Riley.)

torn in both directions. So strong is this habit that in confinement the bird still takes advantage of any sharp object. Thus a pointed stick, sharpened for the purpose, being given a caged butcher bird, all its food, consisting of raw meat, was immediately placed upon it, and either left or devoured.

A neighbor of mine arranged a series of spikes in a star form, for the benefit of the birds that carried on their depredations in the vicinity, and found that they eagerly took advantage of the artificial thorns, a variety of animals being arranged upon the spikes. Not only were living creatures impaled, but various