



The ONLY double cylinder engine to get the GOLD medal at World's Fair, St. Louis.

NOTE— Both Engines on same wrist pin.

Results— One valve motion. Perfect balance of drive shaft.

NOTE— Axle is square, 5x5 inches, highest grade steel. Goes straight under the extreme rear edge of boiler. Arranged with sleeve that makes an 8 inch in diameter, bearing.

Results— Boiler is carried on the axle. Absolutely no strain on plates as in a straight flue fire box boiler. Largest bearing surface for drivers.

NOTE— Axle is at exact rear edge of Boiler.

Results— No rising up in front—perfect maximum of tractive power.

NOTE— Highest grade of brass equipment. Crosshead pump, injector, and steam syphon for filling tanks.

Results— Handiness and durability under long continued severe service.

NOTE— Plow Hitch combined with engine.

Results— No extra price for a hitch.

NOTE— Height of boiler off ground 3 feet.

Results— No Fire box to get down in sand or mud, to hold Engine dead.

NOTE— We use a patented compensating gear instead of the Bevel-pinioned, differential.

Results— No trouble from spreading bevels and worn pinions. Rear wheels thrown into lock by a foot lever on platform. Wheels automatically released when foot is lifted.

NOTE— An adjustable variable exhaust nozzle. Operator protected from any heat by Stack having two air spaces, completely surrounding inside stack.

Results— Operator never uncomfortable. Exhaust draft always just as you want it.

NOTE— Perfect balance and finish of Engine, Boiler and gearing.

Results— The best engine to buy for a steady 25 year's faithful service.

THE PORTAGE IRON &

Exclusive Canadian Representatives for the Huber Manufacturing Company, Marion, Ohio.

COLOR AS A PROTECTION TO ANIMALS.

The abundance of animal life around us in the form of quadrupeds of various kinds, birds, fishes, reptiles, insects, etc., gives all of us a chance to interest ourselves during our leisure moments in studying in what way and to what extent the respective coloring of each of these different kinds of animals helps them in the struggle for existence, which they, as truly as we, have to face. Protective coloration of one kind or of another is very common in nature and is found to some degree at least in almost every kind of animal, from the polar bear to the smallest insect. To attempt, therefore, to discuss the subject as a whole would be absurd; hence I shall confine my remarks to a few points of interest about fish, birds and insects.

If we look at the color of fish we find that in the great majority of cases the back or entire upper surface is dark colored, while the belly, or lower surface is decidedly whitish. Can such coloration be considered protective?—that is, does it help a fish either to secure its prey or to avoid its enemies more easily? All that seems necessary to give an affirmative answer to this question is to

remember that when we look down upon water it appears dark, but when we dive beneath the surface and look up towards the light it appears almost white. It is clear then, that a fish's colors are remarkably well adapted to fit in with its surroundings and to assist in its manner of life by rendering it more inconspicuous to foes and prey alike.

If this peculiar color scheme, as we may call it, is of advantage to fish, we should naturally expect to find a somewhat similar scheme in fowl that live on the water, and such we find to be the case to a very large extent, though there are many exceptions or apparent exceptions. Good examples of a similar sort of coloring to what we see in fish are to be seen in loons and in many kinds of ducks and grebes. The explanation of the exceptions or apparent exceptions to this kind of coloration is I believe, to be found in a careful study of the difference in habits of these birds. Such a study, moreover, will lead us to observe the shore birds and waders and their wonderful adaptation in form and color to their mode of life. For instance, who has not marvelled at the inconspicuousness of sandpipers on the sandy beach? or who has not mistaken the bittern for a piece of projecting stick or

root, as it stood motionless and silent in the shallow pool?

The time in a bird's life, however, when it most needs protective coloration is during the nesting season. Every bird-lover should endeavor to find out for himself how far each incubating bird is rendered inconspicuous by its peculiar kind of coloration. We should not forget, moreover, that color protection is most potent when its possessor is motionless, and this state of affairs we find in birds on their nests.

The difference in color between our brilliantly-arrayed male birds, like the male indigo bunting, bob-o-link, red-winged blackbird, rose-breasted grosbeak, and scarlet tanager, and the dull or plainly colored females of these same birds, is largely to be explained on the ground that among such birds it is the female that does the hatching, and hence nature has granted her a high degree of protective coloration, which the male does not possess.

Without, however, going further into the many problems that color protection among birds suggests, let us pass at once to the insects. Here it is that we find the most interesting and richest field for studying our special subject. There are great numbers of caterpillars

or other kinds of larvae, of the mature insects themselves, that harmonize almost perfectly in color with the plants they feed upon or with the things upon which they rest. I need only mention such familiar examples as the caterpillars of the cabbage butterfly, the grass hoppers, the walkingsticks and the numerous moths that rest during the day on the dark of trees and so closely resemble it that they are seldom seen.

But one may naturally say, "We can understand how such colors as these protect insects, but how about those brilliantly-colored caterpillars, beetles, butterflies, bugs, bees and wasps that are so easily seen and yet do not appear even to try to conceal themselves, how do they manage to escape annihilation by their foes?" The answer to this is one of the most interesting things that nature can reveal to us. Nearly all of these insects will be found to possess something that renders them undesirable morsels for birds. This in some cases, as in the case of bees and wasps, is the power to sting; in others, such as the ladybird beetles, potato beetles and some kinds of butterflies, it is the power to emit a very ill-smelling or ill-tasting fluid, or the possession of some nauseating quality that renders