the public, that *the above is the best in the world!*

Every Machine sold, will be *warranted* to be made in a *workmanlike* manner, and of the *best* materials, and capable of cutting from ten to fifteen acres of grass or grain per day, with one span of horses and driver, and in all respects to do the work as well and as easy for the horse, as any other Machine in the country. The following particulars may be mentioned as points of *superiority:*

1. The Machine is compact, simple, durable, conveniently arranged, and easily managed.

2. The bolts are all accessible, and in sight of the driver when on his seat.

3. There is *no side draft*, and the horses can work all day on the machine, as easily as they can plow.

4. The grass is spread evenly over the ground.

5. The Raker's seat is so arranged that the grain may be raked off at the side, away from the track of the wheel, or in the rear as may be preferred.

6. The platform to receive the grain is so constructed, that it requires but a few moments to attach or detach it from the machine, and when on, it is perfectly substantial.

7. The platform, finger-bar and knives may be raised or lowered, and secured at any point, so as to cut the grass at any height desired.

8. The clamp which holds the finger-bar is so constructed that no bolts are required to pass through the finger-bar and so that the same connecting rod, finger-bar and knives are used, for grain and grass.

9. The guard-fingers are so constructed that they mutually brace and support each other, and effectually prevent the knives from chokeing or clogging in any kind of grass.

10. The machine is not likely to get out of repair, but if a guard or knife should break, another can be put on in the field without going to a machine shop.

Literary and Miscellaneous.

FAMILIAR CHEMISTRY.

BY MRS. M. F. H. THOMAS.

CHAPTER III.

The Earths proper, consist of the *rust of metals*; or the union of Oxygen and metals, and are called Oxides. They are clay—oxide of Aluminum; sand—oxide of Silicum; lime—oxide of Calcium; and magnesia—oxide of Magnesium. They are mingled with a large proportion of organic matter—the decayed remains of vegetables and animals. These last constitute the real fertility of the soil. They furnish the Ammonia, and the greater part of the Phosphate of lime; which, with gases from the atmosphere, form the pabulum of vegetable life, and enter so largely into organic structures. The other component parts of the soil, furnish merely a mechanical support; a convenient medium for the transmission of nourishment; or at most, contribute very slightly to their sustenance. The experiment of growing an oak in a quantity of earth, (which had been previously weighed) contained in a vessel; showed, that in a number of years, it lost no appreciable bulk or weight, *though the tree attained considerable size.* The soil, in this case, consisted, probably, for the most part, of the earths proper; and the plant must have been nourished by the atmosphere, and organic remains contained in the water. If, however, a plant in the same circumstances, be watered with distilled water, it will droop and die. A proper admixture of the coarser materials of the pure earth, with the finely divided organic matter, is necessary to regulate the moisture of the soil; which depends, chiefly, upon its capillary attraction. By capillary attraction is meant the force which raises fluids above their level, in minute tubes and porous bodies. Pour water upon a piece of loose sandstone; or a heap of fine sand, and instead of passing directly through, it will remain suspended in its substance, until the whole is saturated. Water poured into the saucer of a flower jar, also, will rise, and moisten every part of the contained earth. It is by this law of capillary attraction, that soils retain their moisture. The rain which falls upon the surface, instead of sinking directly through, is retained in the interstices of the soil, more or less, according to its attractive capabilities; the surplus sinking down, until meeting a stratum of rock, or impenetrable clay, it forms little subterranean rivulets, which uniting, form larger streams, called veins; which bursting out on lower grounds, constitute our springs. Now upon the strength of the capillary attraction of the soil, which depends upon the number and size of its pores, (if too large, the attraction is weakened, hence coarse sand suffers more from drought, than fine,) depends the water-retaining capability of the soil; also its power of attracting moisture from the atmosphere. The vapors held by heat in the higher regions of the atmosphere, during the day, at night, condensed by cold, sink down, (hence the dampness of night air) to the stratum next the earth; which, if thirsty or dry, sucks it in, in proportion to its attractive power. Hence the difference which can be observed, in times of drought, between two fields, equally exposed to wind and heat.

Water in its natural state, is always mingled more or less, with foreign ingredients. Expose a glass of the purest spring water, to heat and light; and, in a short time, a green film will be observed to cover the surface. This film has been proved to be a real vegetation; and as no organized structure can originate without a germ, it must be the offspring of organic remains in the water. This is proved by the fact, that on distilled water *similarly exposed, no such* phenomenon occurs. Rain water is the purest of natural waters; as it contains no saline, or earthy ingredients. Evaporation and distillation, are analagous processes. Place, for instance, a shallow dish of brine; or any saline solution, in