

Improved Horse Rake.

The ordinary horse rake is so made that it has to be turned over by hand. At each winrow, the mechanism which prevented the rake from revolving is withdrawn, and thrown in again when the hay is deposited. It has occurred to the inventor of this rake that the machine might be made self-acting, so that no hand labor whatever would be required, and the team merely drawn over the field. In this plan he has succeeded, and the engraving illustrates the means by which the end is accomplished. The details are quite simple, and while the rake is made capable of doing the work efficiently alone, it is readily converted into the ordinary rake, and the load can be discharged at any time or place, as in the old-fashioned machines. The frame of this machine has a shaft and crank wheel, A, which is driven by gearing from the main axle. The crank wheel has a slotted connecting-rod, B, which is attached to the lever, as shown.

This lever works on the shaft the rake teeth are attached to, and has a joint, at C, where the teeth pass through the slotted guide. When the team advances, therefore, the crank wheel will revolve, and the rake be caused to move up and down, thus discharging its load without any action on the part of the driver. The time of discharging the hay can be regulated by altering the length of the slot in the rod, so that more play will be given to it before it commences to lift.

When it is desired to use the rake as an ordinary one, the stop, E, is thrown into the crank wheel; this also disengages the coupling, G, from the crank wheel, so that the rotation is stopped; the rake can then be used at pleasure. There are also bars affixed behind, so that the teeth pass by them as they rise, thus preventing the hay from being scattered, and causing it to drop in one place, making a compact winrow. The pedal, H, is for the purpose of depressing the teeth of the rake when desired, and the same may be held up when proceeding to work by the chain, I. This seems to be a well-designed and efficient machine.

A patent was allowed it through the Scientific American Patent Agency, December 29, 1865, to Daniel G. Adelsberger, of Emmetsburgh, Frederick Co., Md. Address him at that place.

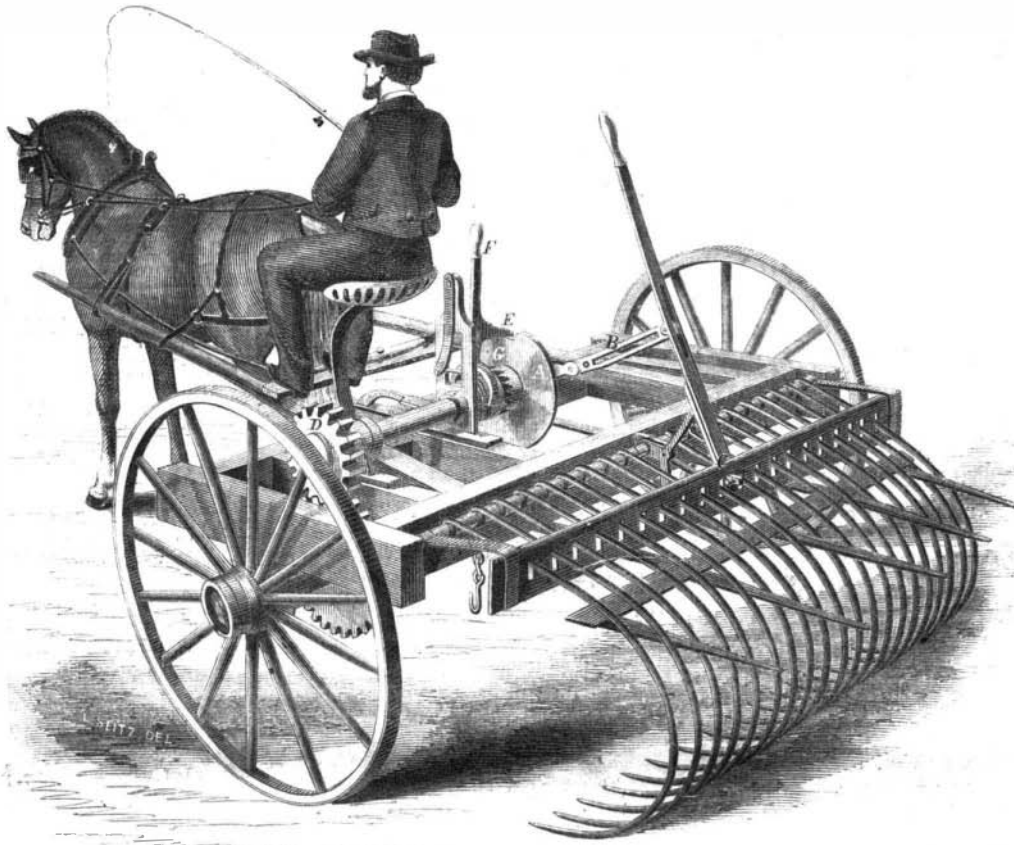
RENDERING CLOTH UNINFLAMMABLE.

A correspondent from Danville, N. Y., asks us to tell him what is the best preparation to render cloth incombustible; in reply we must say that we know of no substance that will do this. Cloth may be prevented from burning with flame, but it cannot be protected from destruction by heat; it may be saturated with substances which will render it, under ordinary conditions, uninflamable, but they will not make it incombustible. The substance that has been most used for this purpose is alum, though the tungstate of soda has been highly recommended.

Alum acts in two ways to prevent cloth from burning with flame. It has a strong affinity for organic substances, and when applied to cloth it adheres very firmly to the fibers, partly combining with them, and partly covering them with a film which shields them from contact with the oxygen of the atmosphere. When cloth thus protected is subjected to the action of sufficient heat, it undergoes decomposition, the hydrogen and oxygen are

driven off, and the carbon remains, in the form of charcoal or tinder; the cloth is charred. Burning is the combination of some substance with oxygen, and flame is the burning of a gas. The reason why hydrogen does not burn when it is expelled from cloth protected by alum is, it is driven off so slowly that the particles are scattered, and before they come in contact with the oxygen of the atmosphere they are cooled below the temperature at which combination takes place.

Another action of alum in preventing the rapid combustion of cloth, is the cooling effected by the expulsion of the water of crystallization. Alum crystals contain a large portion of this water, which

**ADELSBERGER'S HORSE RAKE.**

is of course in the solid state, and the first action of heat upon alum is to expel the water of crystallization. In escaping, the water is changed from the solid to the gaseous form, absorbing and rendering latent in the change both the heat of liquefaction, 140° , and the heat of vaporization, 960° , in all 1100° . So long as this change is going on, it tends to keep the cloth cool, and thus to prevent combustion.

Cloth protected by a wash of alum, is, however, merely prevented from burning suddenly with flame; if subjected to sufficient heat, it is completely decomposed and destroyed; though the heat acts only on the portion of the fabric subjected to its influence; it is not propagated throughout the whole mass, as in the case of unprotected cloth.

SPECIAL NOTICES.

Samuel Fox, of Deep Car, near Sheffield, England, has petitioned for the extension of a patent granted to him on the 17th day of May, 1853, for the term of fourteen years from the 6th day of April, 1852, for an improvement in umbrellas and parasols.

Parties wishing to oppose the above extension must appear and show cause on the 19th day of March next, at 12 o'clock, M., when the petition will be heard.

Jonathan S. Turner, of Fair Haven, Conn., has petitioned for the extension of a patent granted to him on the 13th day of July, 1852, for an improvement in alarm clocks.

Parties wishing to oppose the above extension must appear and show cause on the 25th day of June next, at 12 o'clock, M., when the petition will be heard.

Ebenezer W. Phelps, of Elizabeth, N. J., has petitioned for the extension of a patent granted to him on the 6th day of April, 1852, for an improvement in moth traps to bee hives.

Parties wishing to oppose the above extension must

appear and show cause on the 19th day of March, next, at 12 o'clock, M., when the petition will be heard.

Exceedingly Hard Iron.

Some years ago, M. Gaudin found that by heating iron, tolerably free from carbon, with a small quantity of boron, to a very high temperature, he obtained a product which could not be forged, but which possessed extraordinary hardness. He has now found that an equally hard metal may be obtained by adding to ordinary cast iron, in fusion, phosphate of iron and peroxide of manganese—he does not mention in what proportions. The product

cannot be forged, but it casts easily, and is therefore readily applicable to the construction of such machines, or parts of machines, as require in their material extreme hardness rather than tenacity. The metal so produced is, moreover, singularly sonorous, and M. Gaudin, accordingly, proposes it as a material for bells. He finds that a still harder metal is produced by the addition of tungsten—again he omits to say in what amount—to ordinary cast iron. He states that this tungsten iron surpasses everything previously known as a material for tools for cutting rocks, and that crystals of it will cut glass as readily as the diamond.—*London Mechanics' Magazine.*

It requires as many as 2,009 tons of coal to produce a small circular block of aniline 20 inches high by 9 inches wide. This quantity is sufficient to dye 300 miles of silk fabric.

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