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Improved Revolving Horse Rake.

A perfect horse rake should be one that can be used under all circumstances, whether the ground is even or uneven, stony or smooth, and be adapted to grain where the stubble is left standing at a considerable height, as well as to hay where the grass is closely cut. These requirements appear to be met in the rake shown in the accompanying engraving. Its simplicity of construction and ease and handiness of operation are also arguments in its favor. They would seem to leave hardly anything further to be desired. The main points of this machine can be readily described without recourse to letters of reference.

The machine consists of an axle, on which are mounted two wheels, and which carries a frame consisting of a pair of thills connected at the rear by a platform, from which rises the driver's seat, and in front, just behind the horse, by a cross bar, to which is attached the whiffletree. From this bar to the axle is a central longitudinal bar, which serves as a base for supporting an upright and lever, used for raising the rake and its appurtenances from the ground when the rake is not in use and which is controlled by the foot of the driver. Sliding in guides attached to the thills are two uprights, connected at the top by a cross bar and sustaining at the lower end the rake head. A third upright connects with a handle, seen in the engraving as held by the driver, having a cross foot at its bottom which ordinarily holds the rake teeth to prevent them from turning. A forked spring on a horizontal bar rigidly attached to the upright handle holds the teeth down until the time for their rotation arrives.

The operation is simple. While working, the upright or hand lever is held back and the horizontal or foot lever is allowed to govern itself, as in the engraving. If the rake, being loaded, is to be rotated, the upright lever is pushed forward, which releases the teeth and they perform a half revolution, which completed, the rake is again in position and locked by the forked spring. If the rake is to be lifted so the machine can be used as a vehicle merely, as when going along the road, the foot lever is depressed and held in that position by a catch under the driver's seat. This movement raises the rake bodily from the ground. Also, if stones or stumps, or inequalities of the ground are to be avoided, the rake or only the front of it may be raised by the use of these two levers. For grain which has been cut high this machine will prove just what is needed as the rake can be held at any position desired. The woodwork can be constructed by any ordinary wood worker, and the iron work is so simple and plain as not to tax the resources of any country blacksmith.

Letters patent were granted through the Scientific American Patent Agency, July 30, 1867, to Charles Howard, Bearsville, Ulster county, New York, who may be addressed relative thereto.

Improved Suspended Lever Scale.

Practical mechanics prefer the action of the lever to that of the spring when its effects are repeatedly and frequently required, because that of the lever is always constant while that of the spring varies with its tension, which may be affected by atmospheric temperature, sudden strains, or continued use. Still, as applied to weighing apparatus for ordinary traffic the spring balance has proved very reliable. The weighing scale represented in the engraving works altogether by lever power and is sufficiently accurate under all circumstances. It is secured to a post, wall, or casing by the pivoted feet, A, by which it may be swung out of the way when not in use, and it can be held in any position by the thumb screw, B, which binds the scale to the foot, A. The lever, C, is pivoted at D, and connected by a vertical strap at

its other end to an eccentric E, on a fixed stud. To this eccentric is attached the weighted pendulum, F, which carries a pointer that traverses the segmental slot having on both sides a scale, one for light and the other for heavy weights. On the size shown in the engraving any body placed on the



HOWARD'S PATENT HORSE RAKE.

hook, G, will show its weight in ounces and pounds, up to ten pounds, on the inner scale, while the outer, when the article to be weighed is placed upon the hook, H, denotes the weight up to fifty pounds. For the use of butchers, grocers, and other retailers a platform or scoop can be attached to the hooks. It is one of the best improvements in weighing apparatus for the ordinary purposes of retail trade yet presented. A patent was obtained for this scale through the

course, by far the best, the glass cracking before going off. It will, however, be seen that none of the so-called safety lamps can be depended on when coming in contact with a strong explosive current of fire-damp and air, but are in reality mere indicators of danger, it being clearly demonstrated that all lamps will explode the gas when the mixture is sufficiently strong.—*London Mechanics' Magazine.*

London Underground Railway.

A coroner's jury has condemned the atmosphere of the underground railway. They do not go the length of a verdict of manslaughter, but they say that the atmosphere accelerated the death of a woman named Dobner, who resided at Eton. She traveled from King's Cross to Bishop's road, and on reaching the latter station, was taken ill and died suddenly. One of the surgeons who made the *post-mortem* examination, said she was laboring under disease of the bronchial gland, and undoubtedly the suffocating air of the underground railway had accelerated death. The coroner said he had experienced the depressing effect of that railway, and therefore avoided it as much as possible. The tunnels and stations should be ventilated, but he supposed that would not be done until some shocking loss of life from suffocation had occurred.

The only underground system of railroading by which good fresh air may at all times be enjoyed is the Pneumatic plan. The cars being propelled by atmospheric pressure, it is only necessary to open a ventilating valve in the car in order to admit just the desired quantity of air, which is always pure, as there are no cinders or foul gases present. The air rushes like a hurricane through the pneumatic tunnel, always keeping the interior walls dry and sweet.

The Cuban Telegraphic Cable.

The submarine telegraph connecting the main land of the continent with the Island of Cuba has been successfully laid and is now in operation. The rates of tolls adopted by the Havana Cable Company are as follows:—To Key West, \$3-50 for twenty words, \$1-75 for ten, and 20 cents for every word over twenty. To England, \$53-50 for twenty words: \$26-75 for ten, and \$2-75 for every word over twenty. To Ceylon, \$81 for twenty words and \$31-25 for ten. To the United States, to any part, \$10 for twenty words, and \$5 for ten, and 50 cents for every word over twenty.



FRANKLIN'S SUSPENDED LEVER SCALE.

Scientific American Patent Agency, July 16, 1867. It is manufactured by B. A. Drayton of Utica, N. Y., and each one is warranted to weigh correctly. Further particulars may be obtained by addressing Franklin & Read, Poland, Herkimer Co., N. Y., who will give any further information that may be desired.