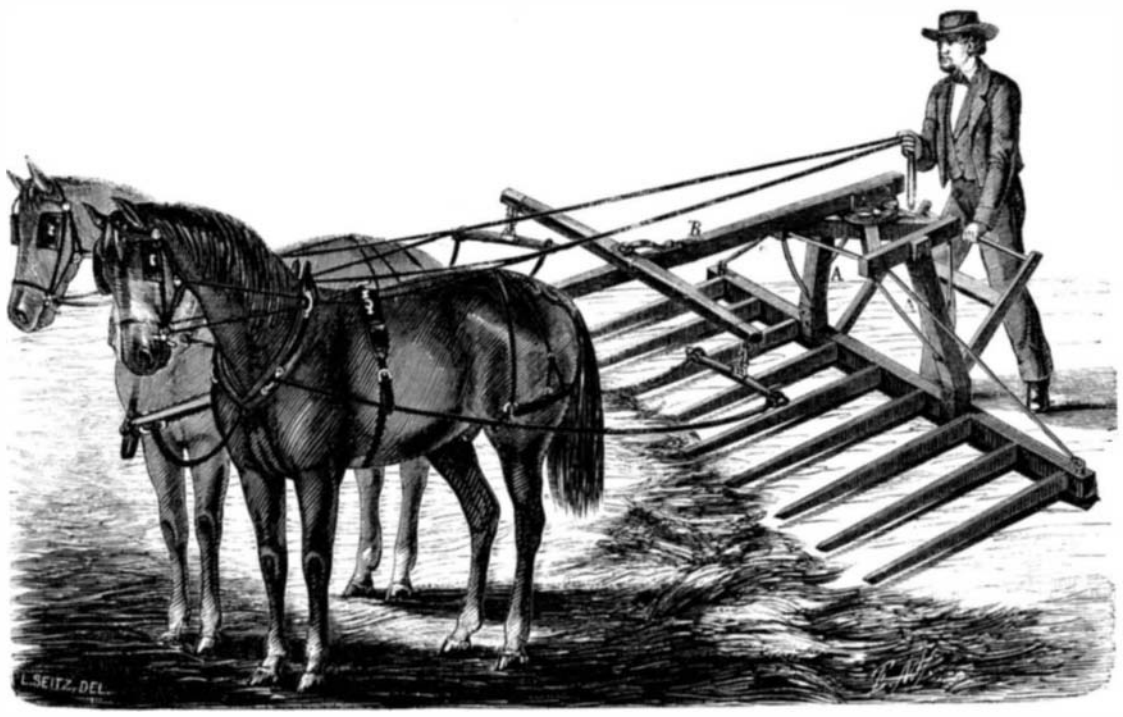
Improved Horse Hay Rake.

Unlike most hay rakes this is not revolving, the teeth—of which there are but one set—being always presented to the hay or grain to be gathered. It is a device intended for carrying the hay to a stack, as well as for raking it, and obviates the necessity for cocking it. The rake teeth and head are unusually strong, the former connected to the uprights, A, which are strongly framed together by diagonal braces at the top, strengthened by iron braces passing from the top to the uprights, A, and to the ends of the rake head. The rake head is secured to the uprights by metallic straps, which, forming journals for it, permit it to have a slight semi-rotary movement, sufficient to allow the points of the rake teeth to be raised enough to clear an obstruction, which is done by the hand of the operator by means of the rigid frame projecting from the rear of the rake head. To the top of the frame, formed by the uprights, A, and their braces, is secured the tongue, B, which has a plate, its sides turned up to form a socket for its reception. Under this plate is a metallic ring secured to the frame and on this the plate is moved. Pins passing through the tongue and through slots in the turned up sides of the plate on the tongue allow a slight longitudinal movement of the tongue to throw a hook attached to the rear of the tongue into and out of a slot in the rear of the metallic plate. A central pin passes from the tongue through the circular plate so that the draft comes upon the locking hook and the pivot pin.

In operation the hay is collected upon the rake and carried to the stack or barn; the horses are then backed or the traces slacked enough to disengage the hook at the rear of the annular plate. The horses are then guided half round in either direction and the machine drawn away from the hay. The team is then turned back one quarter round and started forward, the driver, at the same time, stepping on the rake head nearest the horses, when the machine is ready to collect another load.

The machine is so simple in construction, and so ready in operation that farmers cannot fail to perceive its advantages. A patent was obtained for this device through the Scientific American Patent Agency June 25, 1867, by James F. Swinnerton, of Marion, Ohio. See advertisement on another page.



SWINNERTON'S HORSE HAY RAKE AND GATHERER.

Railroad Officers to Wear Uniforms---A Step in the Right Direction.

A long-needed reform in railroad management was introduced by the legislature of New York last winter; it was by passing an act compelling the employés of all railroad companies in this State to wear a distinguishing uniform. This law went into operation on the 22d of October, and that date may be set down as an era in travel by rail in this State.

This subject of railroad uniforms is one which has long been agitated, and it has been discussed in all its bearings, both by railroad men and the press; the employés, we believe, always expressing themselves as strongly opposed to the measure.

It seems that, in addition to the fact that innovations are always opposed, no matter how necessary, the employés of railroads looked on the adoption of a uniform as a species of degradation not to be tolerated; they regarded the uniform as a sort of livery, and viewed its adoption as a badge of servitude on a par with the livery of a lackey. It is likely, that if this subject had been straightforwardly put before them, and the vast difference between the livery of a servant and the uniform of an officer been properly explained, this opposition on the part of those most interested—except the traveling public themselves—would have been deprived of its force long ago.

The reasons which explain the necessity of uniforms for officers and privates, in the army or navy, urge with equal force the propriety of its use by men intrusted with such important duties as the officers of a railroad company. Common sense suggests it, and discipline demands it. That the use of a uniform will add as much to the discipline of a railroad as it does to that of any other organization, is a fact which seems to us to be perfectly clear. Let any railroad engineer or conductor ask himself what sort of order could be maintained in a regiment or on board a man-of-war, if "all hands" dressed as they pleased; we think we can answer for him that, instead of order, confusion would be the order of the day.

We do not think, from what we have seen of locomotive engineers—and we have occupied that responsible position—that they are at all afraid of being scrutinized in the performance of their duties when in charge of a train; and it is only on such occasions, as we understand it, that any officer will be required to wear any insignia of his rank any more than a naval officer ashore, off duty, is required to wear his uniform.

Many of us can remember the great opposition that existed at the time the uniform was adopted by the police force of New York city; and it is well known that, among other good results, the increase of the vigilance and *esprit du corps* of the force are not the least. Indeed, this soon became so plain, that the police in the principal cities of the Union soon adopted the once detested uniform. The manifold advantages of the uniforming of conductors, baggage masters, and brakemen, will suggest themselves at once to every one who has had much experience in railroad traveling—advantages both as regards comfort and safety. Instead of wandering about the station, while the engine is fizzing away, impatient to start, in order to make a necessary inquiry, one can now distinguish the officers at a glance; and, instead of asking a dozen people before he hits the person he is in quest of, he can go at once to the proper authority.

We will venture to predict that so great an improvement will result from this important innovation, that it will, before long, be adopted by other States; indeed, we hope it will be made general, all over the Union.

No doubt there are some roads where its benefits would be more strongly felt, on account of improving the discipline, than others which we might name, which are managed with skill and administrative capacity. This subject has occupied our attention for some time; and the only argument which has ever been urged, to our knowledge, against the uniforming of railroad officers, namely, the opposition of the employés themselves, we think, will cease as soon as they have seen the benefits of the change.

PACKER'S PATENT BROOM HEAD.

The ordinary broom soon becomes permanently curved and worn to a stub. As the broom corn can be easily obtained at a low price, and the handle and labor of attaching the broom corn to the handle constitutes the greater part of its cost, the inventive genius of the country has designed several devices for securing new corn to the handle when the original is worn out, with but little labor and diminished cost when compared with the original first price of a broom. The one shown in the engraving is exceedingly simple and very cheap.

The head, A, is of metal and is secured to the handle by a socket. Near the lower end of the handle a bolt, B, is inserted and held, having on its lower end a threaded thumb nut which moves the yoke, C, that is guided by forks on its ends which slide on the side arms of A. The lower ends of these arms have wires passing through loops in the arms, which wires are bound through the broom and secured by means of loops passing over wires or bars going across. In filling the broom head the buts of the corn are laid across the concave side of the cap or head, in alternate layers, with their brush projecting upon either side. The binding bar is then forced down upon it crowding the buts into the concavity of the head and clamping it securely into place. The bands (outer) and the wires are then moved to place, sweeping the corn to position, and secured by hooking.

This device was patented through the Scientific American Patent Agency, Aug. 6, 1867, by T. G. Packer, of Mexico, N. Y., who will answer all inquiries relative to the sale of territory or rights to manufacture.

Rapid Scientific Progress.

Perhaps nothing can show how much more rapidly the republic of mind advances, in rendering practical results, than any one mind, however practical, and however scientific, could alone effect, so well as the rapid applications of science, which are now being effected in this country and Europe. When Napoleon crossed the Alps, no one thought of piercing them as his successors are doing. The idea was too great and novel, even for his most original and daring grasp of thought. When he was longing to break down the British Empire of the seas, and his flotillas were waiting at Bologne, with his men and horses, already to invade England, there was a man Fitch, who had driven vessels by steam on the Delaware, and another Fulton, who could and would have ferried him across the channel by steam, safely, had Napoleon had faith in steam and in him. Now, steamers cross that same channel in two hours or so, and railroads are not only penetrating, but locomotives are climbing over the Alps, as easy as a kitten sticks in her claws and climbs over a fence. The spirit of humanity, that is, the joint thoughts of many men, take in advanced ideas, and reduce them to practical and working order, more than any one autocratic mind alone. One mind carries an invention one step, and then it is exhausted and can go no further. But another begins where the former left off, until, step by step, hights are climbed, and depths are sounded, and difficulties bridged over. that only a succession of various constituted minds could effect.

There are at this time one or two ideas gaining ground daily in the public mind, and certain to work themselves out into practical shape in a very few years, and with the most practical results. One is by means of signals from Cape Hatteras Light House, to inform vessels passing within sight or sound, of the state of the weather, as to storms up and down the coast. The laws of storms are now getting each year to be better understood, so that from the state of the weather at certain points the mariner can know when he is safe at others. For instance, the most dangerous storms to the sailor are those northeast gales which sweep along the coast, beginning generally in the southwest. They probably originate in the Gulf of Mexico and strike the coast of Florida or Georgia. By telegraph the news of such an approaching storm can be signalled from Cape Hatteras to vessels going southward as they pass, and from twelve to thirty-six hours before they can prepare for the most dangerous storms of the coast. A notice of this kind will enable shipmasters to calculate beforehand the entire dangers of his voyage from Hatteras down to Charleston, Savannah, or Key West, and, if necessary, put into some intermediate port, and lie in safety till the storm has passed. That such signal systems will be arranged there can be no doubt. Nor is there any doubt that eventually it will extend all along the coast, and produce immense good.

Another invention will almost be as great an improvement upon the railway system as that upon the four-in-hand stage coach. We allude to the system of pneumatic railroads, a model of which was recently exhibited in New York at the American Institute. It has for some time now been successfully demonstrated that letters and parcels could be transmitted successfully, all over London, on little railway cars, forced through air-tight tubes by the air-pump—in fact blown through. These tubes have been laid underground thus far, but there is no reason why they should not be made larger, so as to include passenger trains. It is asserted that the first cost of this tubing will be but $50,000 per mile, and that of working the engines far less than that of running locomotives.—*Philadelphia Ledger.*

Preventing Railroad Collisions.—A correspondent of the *Mechanics' Magazine* proposes a plan whereby every train on a track shall communicate with another, before or behind it, whenever the two approach within a certain distance. Electricity is the means employed, the engines of the trains carrying batteries one wire from which connects with the engine bell, the other connecting with the earth. Light insulated supplemental rails, made in continuous length of two miles each, are laid by the side of the main rail, so that the tire of the locomotive wheel runs on both. As long as two trains are not at the same time on one length of conducting rail, no electric current can pass on account of the break joint, but as soon as they come within this particular distance of each other the circuit is completed and both bells will ring.