

**COMBINED HAY RAKE AND TEDDER.**

The principal part of this device, an engraving of which is herewith given, is the tedder, which consists of a novel arrangement of a three-throw crank with sliding forks. The latter are actuated in a manner closely imitative of the motion of the arms of a person in handling a pitchfork to toss the hay, for the purpose of admitting a free circulation of the air through the same and thus causing it to be properly cured before removal from the field. The balance of the invention is a very easy and expeditious manner of converting the tedder frame into an improved horse rake

The oblong frame, which forms the truck, is mounted on wheels and provided with keepers which adapt it for the introduction of a pole or shafts so that the machine may be used with one or two horses, as desired. There is a suitable seat and foot board near each extremity of the axle, A, and inside the main wheels are attached cog wheels, B, which engage with pinions, C. The latter connect with the crank shafts, D. These shafts, as above intimated, are an arrangement of the crank in threefold relation, twice duplicated, and consist of two separate parts, the inner ends of which may meet in a hinged box, H, or be simply inserted in a suitable bearing on the central beam of the frame. E are the fork stems which, six on each shaft, are bent around and embrace the crank rod between shoulders or flanges on the same. Between the parallel parts of the stems, and next to the cranks, are arranged elastic boxes or shifting bearings for the crank connection, so as to relieve the same from sudden strain, and adapt it to the free motion of the forks. The latter are shown in the engraving in two forms; those marked F

are spring forks, the tines of which are coiled to form eyes, through which and a hole near the end of the stem, bolts pass. This, with the bows of the tines, being slipped over open slots, also in the stems, secures the parts quickly and firmly together. This fork is well adapted for light grass. For heavier work, however, ordinary forks, G, are dovetailed by short shanks to the stems and secured by headed screw bolts.

Returning to the crank shafts, D, it will be observed that their outer ends are held in hinged boxes, also marked H. Near the extremities are arranged radial pins which, in connection with loose clutches united with the pinions, C, bring the latter in gear with the cogged wheels, B. A rod or wire between clutch and pinion is led through keepers to a lever, I, placed conveniently to the foot of the driver, so that, by moving the bar in either way, one or both of the sets of forks may be thrown into or out of action. The collars or flanges, shown on the axle, A, serve as guides to the stems in their sliding movement caused by the cranks.

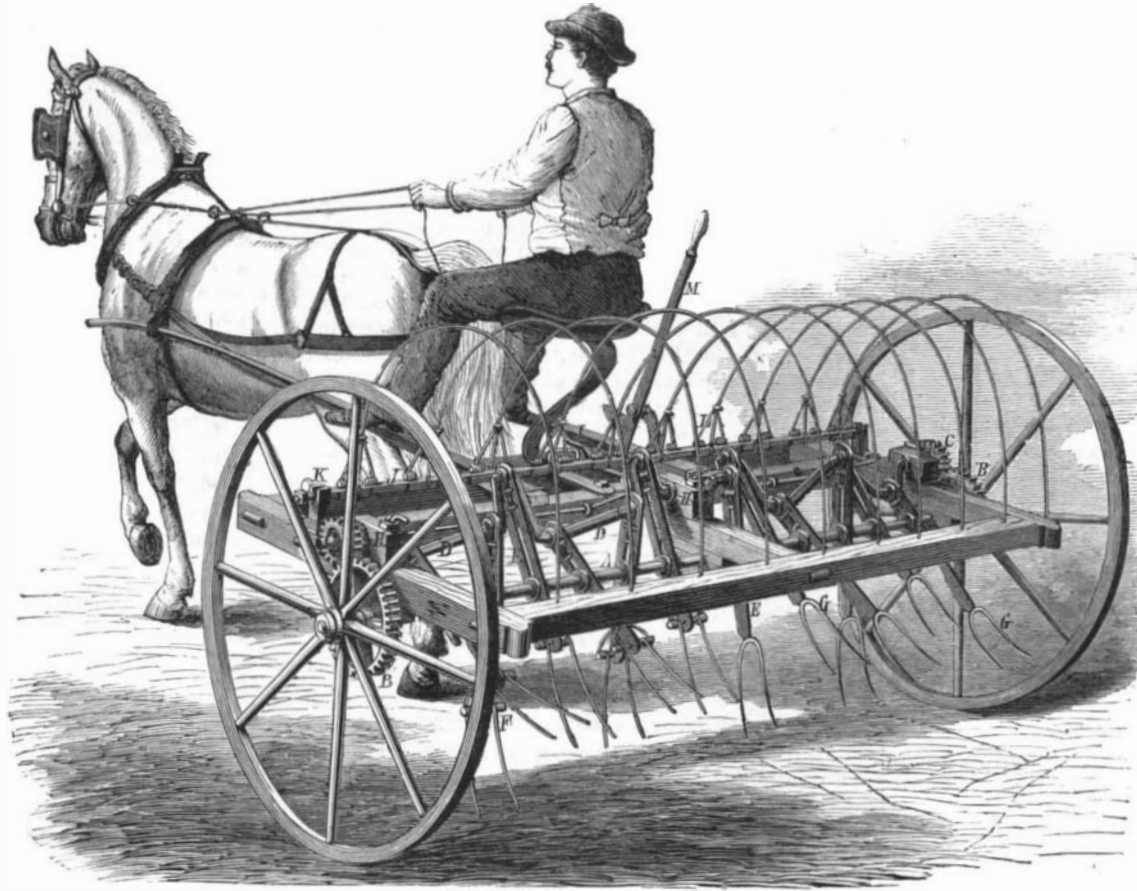
Our artist shows the tedder in action, and the rake also attached to the machine, but out of use. In order to put the rake in operation the tedder must first be removed, an easy proceeding, as the crank bars are quickly lifted from the hinged boxes, H, and the forked stems slipped off the axle. The hay rake bar, J, fits in permanent bearings, K, placed on each side of and centrally on the frame pieces. The tines or teeth are independent in their motions on the shaft and are held thereon between shoulders. Spring braces, L, bear upon every tine, so that if one be raised the others are not affected. A hand lever, M, connects with the shaft and serves as a convenient means for raising and discharging the rake. In connection with the same appliance is a foot piece, which, when pressed down and brought under a lug, keeps the rake in an elevated position when not in use.

The reader will, before this, have noted that this device is not complicated, and that it furnishes, in one apparatus, two very useful machines. Its width is about that of the ordinary horse rake. From an examination of the model, we

should judge it to be a machine well worthy of the attention of agriculturists. It has the merit of being a very neat mechanical device for producing an out-of-the-way motion with an unusually small quantity of gearing, a point of importance when considered in connection with the innumerable cogs, racks, pinions and other devices, which too often encumber agricultural machinery for even the simplest purposes.

The inventor is Mr. R. J. Colvin, of Lancaster, Pa., and the date of the patent is April 22, 1873.

Further particulars may be obtained by addressing the



**COLVIN'S COMBINED HAY RAKE AND TEDDER.**

present owner of the invention, Mr. M. T. Boyer, of Parkersburgh, Pa.

**IMPROVED COMBINED ROLLER AND IRRIGATOR.**

The combined roller and irrigator, represented in our illustration, unites, in obvious utility, two sources of success to industrious husbandry—the preparation and proper irrigation of the soil. It is quite simple in construction, so that

ranged gearing, to impart proper speed to the pump, E, attached to the frame, B, over one of the bearings of the roller, A. When the machine is drawn over the ground, the roller, rotating, communicates its motion to the pump, which ejects, with any required force, the fluid contents of the cylinder with which it has been previously filled; air is supplied through the opposite bearing to satisfy the vacuum. A lever, actuated by the foot of the operator, and not shown in the engraving, serves to disconnect the pump gearing, when the services of the roller alone are desired.

The present engraving illustrates one of the simplest and cheapest forms in which this machine is constructed. It is built of any desired capacity, from the hand garden roller of the horticulturist to the largest and heaviest of machines operated by steam for the rolling and sprinkling of streets. One form of construction confines all the machinery within the drum, pendant from a tubular shaft in the center of the roller longitudinally. In this arrangement the fluid is forced through the shaft into the frame, which is also tubular as well as the drawing attachments, a hose being attached to any convenient point. In the more expensive forms of construction it is considered an advantage to build the machine entirely of iron, constructing the frame of piping, as well for the additional strength and beauty of form as for the added water space and utility.

By using this machine, it is claimed, liquid manures are made more cheaply and readily available. In the distribution of all fluids by this irrigator, the liquid is thrown high in the air and falls in fine rain or spray over the surface. As a roller it possesses the same advantages as any ordinary land roller, being adjustable in

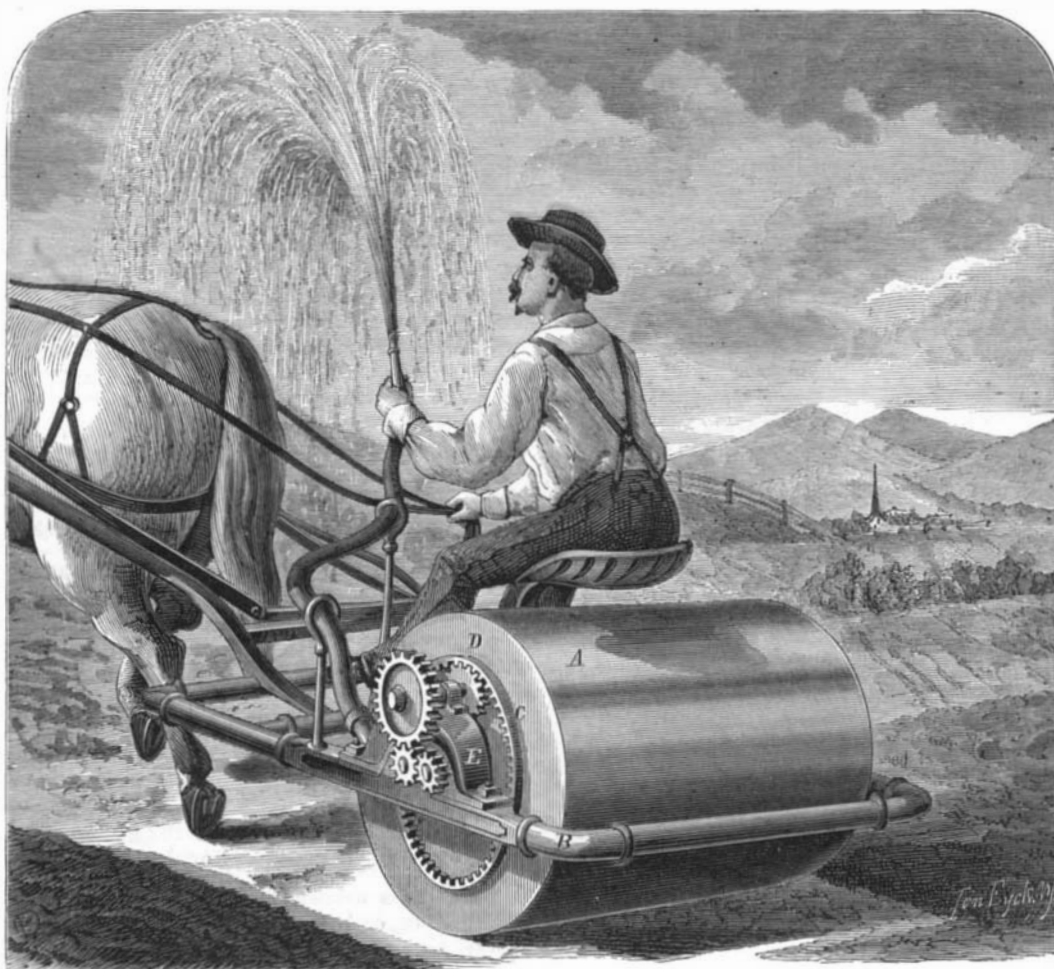
weight, and that weight being in the best position to be most out of the way and most advantageously applied.

Patented June 17, 1873. For further particulars address the inventor, Mr. Dean S. Howard, Drewry's Bluff, Chesterfield county, Va.

**Burning Coal Beds.**

The so called "burning mountain" at Dudweiler, in the district of Saarbrück, which has been an object of interest to tourists and men of science for more than a century, is now shorn of its attractions; to the former it presents the spectacle of what is, at best, but a smoking mountain; to the latter it is a mere impostor, since, instead of being, as was supposed by earlier scientific observers, a display of volcanic action, or a proof of central fires, it is now clearly established as the result of the spontaneous combustion of a stratum of coal. These smoldering fires, produced by some change which takes place in constituents of the coal may, indeed, burn with more or less intensity for centuries. The thought of such waste is peculiarly distressing at the present time, and the burning mountain of Dudweiler shows only common good feeling by mitigating its destructive proceedings at this crisis. A coal bed at Niederplanitz, near Zwickau, in Saxony, has been burning in a similar manner between 300 and 400 years. The heat given out by this subterranean fire, at a cost which it is distressing to calculate, is not wholly wasted. An ingenious person, since dead, has established a magnificent nursery ground on the burning area, in which, by means of a system of pipes, the supply of caloric is regulated and applied at will. Tropical plants flourish here in the open air with a luxuriance which the best forcing houses and conservatories cannot insure.—*Mining Journal*.

[Passing through the coal region of Pennsylvania, not long ago, we saw smoke issuing from a mountain in the distance, which, we were told, had been burning for more than a quarter of a century; and that a great deal of money had been expended in the attempt to sever the coal vein and conduct water into the seams to extinguish the fire, but without success.—Eds.]



**HOWARD'S COMBINED ROLLER AND IRRIGATOR.**

but a brief description of its parts (as indicated by letters in the illustration) is necessary. A is a hollow drum of wrought or cast iron, so arranged in the frame, B, which is made of hollow tubing, as to revolve on hollow watertight bearings at one or both ends. It also has a gear flange, C, attached to either end, the teeth of which engage with a pinion at D, which, in turn, gives motion to any suitably ar-