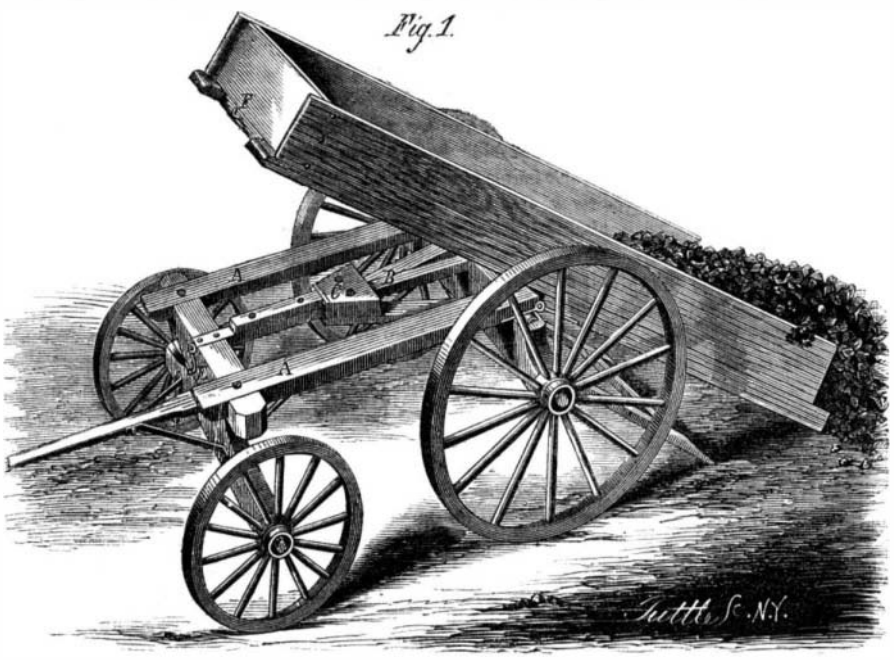
SCIENTIFIC AMERICAN

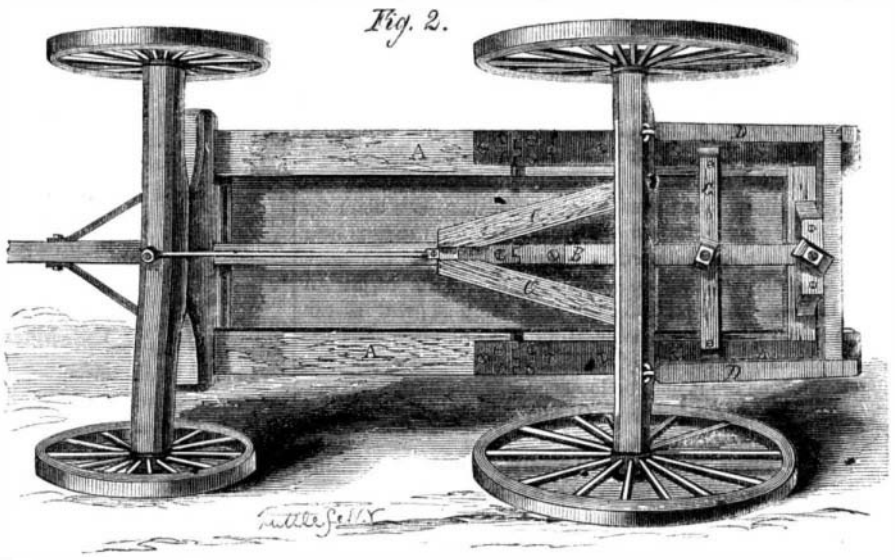
A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XVI.---No. 24. [NEW SERIES.] NEW YORK, JUNE 15, 1867. $3 per Annum. [IN ADVANCE.]

Improved Dumping Wagon.

Loads of coal, stone, gravel, etc, carried in a box wagon or a four wheeled vehicle, must be removed by the shovel or hand, a slow and laborious process. Two wheeled carts only, can be tipped to discharge the load in one heap, but carts are hard upon the horse and do not have the capacity of wagons.





MUNGER'S IMPROVEMENT IN WAGONS

To remedy these defects the wagon seen in the accompanying engravings has been contrived, and its operation is all that could be desired.

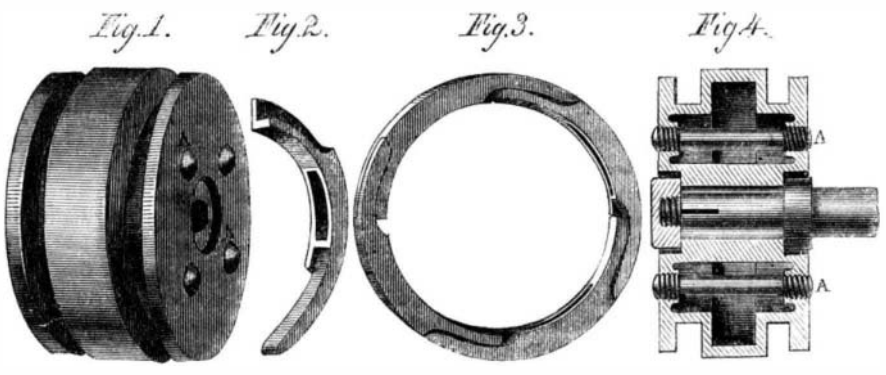
Fig. 1 shows the wagon in the position of dumping a load, and Fig. 2 is a view of the under side showing its peculiar construction. The hind axle, instead of being rigidly secured to the body, is made to slide on the frame. The side bars, A, of the frame are hinged at a point near the center, the back part forming a portion of the wagon body. On the side bars of this portion the straps of the hinges extend to the back end. On these iron straps the rear axle slides, its movement being facilitated by rollers set in the bolster or upper portion of the axletree. A central longitudinal bar, B, also hinged in line with the side bars, serves partially as a guide to the axle from which two diagonal braces, C, extend to the central bar. A brace also passes from this bar to the king bolt on the forward axle. The braces where they converge, embrace the central bar as seen at C, Fig. 2. A frame, D, same figure, is hinged to the back of the rear axle, and when this axle is in place is held to the body by a button, which thus thus keeps the axle in place and holds the body and frame snugly together by the aid of a hook, E, on the forward bolster which catches into a staple on body front at the F, Fig. 1. The wagon is now in position for drawing a load.

When the load is to be dumped the frame, D, at the rear of the axle is unfastened and allowed to fall with its end resting on the ground as a brace, seen in Fig. 1, the front hook is unfastened, and the horses backed, which runs the body back on the rear axle until it has passed the central hinges when a very slight effort will tip the body and deliver the load. To return the rear wheels to their former position, block them in front and start the team. In Fig. 2 is seen a cross bar, G, with a button by which the rear wheels may be held in the position shown in Fig. 1, if it is desired to draw a light load and discharge it without sliding the rear axle. A patent was granted for this combination Feb. 12, 1867, to George N. Munger, of New Haven, Conn. For further information address all communications relative thereto, to A. D. Platt 158 Broadway, New York.

Improved Engine Piston.

The use of the steam itself as a spring to keep the packing rings of a cylinder piston out to their work, is gradually superseding the employment of setting-out springs, and when the steam can be made to act with the pressure, is certainly an improvement. The engravings are views of such a piston which, if extended trials and the opinions of practical men are of any value, is a vast improvement on the piston and rings ordinarily used. The inventor claims that the rings adapt themselves better to any irregularities in the bore of the cylinder than other rings, and also when, as in those of steam hammers, one end is worn larger than the other; that it is always steam tight in cylinders of regular form, making a saving in fuel, as no steam can escape before having done its work; that there is less friction than with the common piston, as it is always in proportion to the pressure of steam.

Fig. 1 is a perspective of the piston with the segments of the ring removed. Fig. 2 is one of the segments, Fig. 3 the segments placed in position, and Fig. 4 a section through the piston. The piston is a single casting, cored, and having no follower to be bolted on. The coring between the hub and the periphery renders it light, while the screw bolts, A, which pass through it and are riveted on the outside, strengthen it and close up the holes left for the support of the cores, steam tight. The piston rod has a collar on it, seen at B, Fig. 4, which may be either recessed into the piston as in the engraving, or may come square against the outside or head. The rod for the piston of a horizontal cylinder, passes through a hole oval in form—seen in Fig. 1—by which the piston can be shifted up or down to keep the rod always in the center of the cylinder. When an engine has been run a long time and it becomes necessary to remove the piston from the rod, the nut which secures it, is sometimes corroded on the thread so that it is difficult to start it. To remedy this difficulty the inventor of this piston cuts a slot in the end of the piston rod, as in Fig. 4, which allows the thread to "give" or spring in the act of unscrewing the nut. If salt or brackish water is used, this slot might become closed, and to prevent this a cap nut is used.



WHEELOCK'S PISTON AND PACKING RING.

The form of the segment rings is seen in Figs. 2 and 3, and their peculiar joints are represented where joined in Fig. 3. This form allows free action, as on hinges, between the sections, so that they can adapt themselves to the irregularities of the internal surface of the cylinder. They are of cast iron, the joints being milled and the face and edges turned. By reference to the engraving it will be seen that where the joints approach, a slight bevel is cut which allows the steam to pass behind and under the segments forcing them outward and also holding them firmly against the inner face of the annular groove. For this purpose the bosses of the heads are turned somewhat smaller than the center boss which fits the cylinder. As these beveled channels are toward the outside of the piston it will be seen that in moving in one direction one set of rings are packed, and in the other direction the other set engage with the cylinder surface.

Patents were granted for this device April 5, 1864, Nov. 28, 1865 and April 23, 1867, to Jerome Wheelock. For further particulars address the patentees and manufacturers, Wheelock & Wheeler, Worcester, Mass.

Science Familiarly Illustrated.

The Province of Plants.

Disease and even death have been said to be caused by sleeping in rooms with growing plants. A knowledge of botany might show this opinion unfounded and lead to the invention of a more plausible reason. A familiar discourse on the office of plant life in the economy of nature may not be uninteresting to our young readers.

Among the constituents of the air is carbonic acid. This gas is unceasingly generated in those regions of the earth where volcanoes are now, or were in a former age active; in all ordinary combustion; in the decay and putrefaction of animal and vegetable substances; and in the respiration of men and animals, for in breathing, the oxygen inhaled combines in the body with carbon, thus constantly deteriorating the air by removing the free oxygen or vital air, and creating an excess of carbonic acid. If all the gas thus formed should accumulate, it would speedily destroy animal life, as witness the fatal results when it is collected in deep wells or, under the name of choke damp, in coal mines.

To maintain the proper equilibrium in the atmosphere is the province of the plant kingdom the principal means for whose support being the carbonic acid exhaled by men and animals as useless, but which is absorbed by them and in its place an equal bulk of life-supporting oxygen is given out. Every wind carries the poisonous carbonic acid to the plants, it is taken in through their thousand stomates or breathing pores, it combines with the elements of water and is elaborated into organic matter, thus furnishing food first for the herbivores, then for the carnivorous animals that feed upon the herbivores. So then all our food is either directly or indirectly derived from the plants. The round is completed after the food is digested, has entered into the blood and becomes finally decomposed into carbonic acid and water, and exhaled from the lungs, to be again taken up by vegetation.

Plants also draw nourishment from the earth, and as we have already seen that flesh is formed from the vegetable world, so now we may affirm that the earthy matters of the bones, the iron and other mineral matters in the blood are derived from the same source, so that animals depend absolutely upon plants for their very existence and the great object for which the vegetable world was created seems to have been to stand between the animal and mineral worlds and organize portions of the former for the sustenance of the latter.

BESSEMER STEEL WARE.—It has lately become a familiar test of a certain quality of Bessemer steel, to press a cold plate of it through a tubular die, producing a smooth and flawless cup or pail. This experiment suggests a valuable manufacture for domestic purposes. All kinds of hollow ware made of such metal, being without seam, and much less affected by oxidation, acids, heat etc., than common iron, would be more economical at a higher price. At the same time, the higher value of the steel per pound might be nearly or quite balanced by reduction in the cost of manufacture and the weight of metal. Russ of Gratz, it seems, has commenced this manufacture, though to what extent we are not informed.

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