

THE FLY WHEEL.

In all the variety of machinery and mechanical movement, there can hardly be found an article more perfectly simple than the fly-wheel and yet there appears to be but a very small proportion of mechanics who understand the true nature and principles of it. There are some who even suppose that there is actually an increase of power, by the adoption of a large fly-wheel: and in nearly all cases, it is supposed that a very large and heavy wheel will retain more of the power of momentum than a small one. It will not be disputed that either a man or an engine may accomplish more business of some kinds by means of a fly-wheel to regulate the motion, than they could do without it. A fly-wheel is a mere momentum retainer. When power is applied to machinery through a fly-wheel, the latter at first retards the motion of the former, until a sufficient quantity of power has been accumulated in the fly-wheel to overcome the inertia thereof; and the power thus accumulated is retained in the form of momentum, and held in readiness to be applied to supply any deficiency of the applied power, to overcome the resistance of the machinery driven: and even when the first motive or moving power is withdrawn altogether, the fly-wheel will continue to supply its own accumulated power till its momentum is exhausted. But this property of retaining power is by no means peculiar to large wheels. The momentum depends even more on the velocity than on the size or weight of the wheel, and when the velocity is doubled, the momentum is quadrupled. For example: a wheel weighing 100 lbs., being put in motion with a velocity of 1000 revolutions per minute, will furnish as much momentum as a wheel of equal diameter with a velocity of 500 revolutions, and weighing 400 lbs. And by the same rule a wheel only two feet in diameter and weighing 100 lbs., being put in motion with a velocity of 128 feet per second, will supply as much momentum power for the regulation of machinery, as a wheel eight feet in diameter and weighing 1600 lbs., with a velocity of 32 feet per second. Very few mechanics, even among those who are reputed to be scientific men, can comprehend this fact, nor will they be persuaded that a little 20 inch wheel can be made to regulate large and heavy machinery as well as a large and heavy wheel. But facts are stubborn things, and it may yet be learned by the "learned," that many superfluities of modern machinery may be dispensed with.—*Sci. Amer.*

Heated Rooms.

Rooms heated with anthracite coal, and rooms heated with close stoves in which wood is burnt, have very dry atmospheres. The use of water in such rooms is very congenial to health, but the water should not be placed in an iron or tin vessel upon the stove, for the reason that it will undergo that degree of heat, which will make its vapors offensive and injurious to breathe. It is as injurious to the human system to breathe putrid water vapors of this kind, as it is to breathe the vapors from stagnant ponds in hot weather. If water is used upon a stove, an iron pan should be made use of, and this filled with dry sand; in the sand set an earthen bowl filled with clean water, which should be changed twice a day, and the bowl washed and kept as clean as if used for a drinking vessel.

Where hard coal is burned in a grate, a glass globe should be suspended in the room filled with clean pure water, and as the heated air rises to the top of the room, it will steadily evaporate the water, and moisten the dry and heated air. Persons who prefer the atmosphere of salt water vapor, can add salt to the water, or if they prefer an aromatic atmosphere, they can add cologne water, or any other perfume which they prefer. It is as important to have clean air for breathing as to have clean water for drinking. Basement rooms where hard coal is burnt, should be frequently ventilated. Small children accustomed to stay in basement rooms, find a bad air near the floor. This air should be removed by allowing the doors to be opened frequently to let in fresh air. A little care in these matters will tend wonderfully to comfort and enjoyment.

THE HIGH BRIDGE AT HARLEM, forms a part of the immense works erected to bring the water of the Croton river to New-York. The Dam at the river, which is 70 feet wide at bottom, 7 at top, and 40 feet high, creates a pond of 5 miles long, covering 400 acres, and containing 500,000,000 of gallons of wa-

ter. From this the Aqueduct proceeds, a distance of 33 miles, to Harlem river, which it crosses on the magnificent bridge of stone, which is 1,450 long, having 14 piers, 8 of them bearing arches of 80 feet span, and 7 others of 50 feet span, 114 feet above tide-water at the top. The aqueduct itself, which is built of stone, brick, and cement, is 8 feet 5 inches high; 6 feet 3 inches wide at the bottom, and 7 feet 8 inches at the top; and will discharge 60,000,000 of gallons of water every 24 hours! The length of the aqueduct from the Croton river to the City Hall, is 44½ miles. The whole cost of the work has been about \$13,000,000.

English Plate Glass.

Since the repeal of the excise duties in England on the manufacture of glass, which took 40 per cent. of the cost, the business has increased almost beyond belief. Larger and better plates are made than in any other country, and at greater profit. The exports are increased 110 per cent. In 1846, not a single foot of plate-glass was exported to America; in 1847, more was exported to the United States alone than had been exported to all the world in 1846.

The Farm.

FARM BARN AND STABLES.

Barns should be so placed as to make them warm and comfortable for cattle. They should have a southern, or an eastern aspect, and a cellar should extend under the whole building; for this room is the best in the whole barn, and it is made at less cost than any room that can be made in the building. A farmer who has rocks handy, can dig and stone a cellar with labor that is less costly than that of carpenters.

Barn cellars are warmer in winter and cooler in summer than the upper parts of the building. Roots for stock can be kept here and fed out with a great saving of labor compared with storing in the cellar of the dwelling house. And barns may be so finished that hay may be stored conveniently below the barn floor.—This is exceedingly convenient when you are in a hurry—and you always are in the afternoon in hay time. For one man may cart home a load and throw it off while the others are left in the field to gather the hay. When all hands are at home the hay may be levelled down. Rainy weather answers for this business.

Barns should always be set on the same side of the road with the house. Yet we find many farmers placing barns and out-buildings on the south side of the road, and directly opposite to the dwelling-house. This cuts off the most pleasant prospect that is usually to be had from the south side, or end, of the house. It compels you to cross the road many times in a day to see your cattle and feed them. And it exposes you to all the effluvia that is generated in the dung heaps in hot weather—for in hot weather the winds are southerly.

I would place my barn, hog pen, and so forth, on the easterly, or northerly side of the house, rather than westerly, because the east winds are less prevalent than the west; and when they do prevail, they are never so charged with putrid matter as west winds that have blown over heaps of manure.

Farm buildings thus arranged may be set quite near together without offence to the nasal organs. Many steps are saved in a winter by setting the barn and the hog pen near the dwelling house; and you can so arrange them, in most cases, as to be able to run to the stock to be fed, under the lee of the buildings, and free from the north-west winds.

In winter the hogs should be under the barn, both for their own comfort and yours. They will live warm there, and you can carry them food when you go to feed the cattle. In summer a trough may conduct the wash of the dairy directly to the pen, and save you the labor of carrying it by the hand.—*Maine Cultivator.*

Caring Cattle and Horses.

In stables, where hostlers are constantly employed, and currying is one of the principal branches of their business, horses are pretty well attended to in this respect; and in other cases, there are a few favorite horses that are well curried to give them a good appearance, if not sufficiently cared for in regard to comfort. And in a very few cases, oxen are well curried.

Excepting these and some other cases, which constitute the exceptions not the gene-

ral rule, cattle and horses are mostly neglected. This is not so much owing to the want of time, nor to indolence, as to a want of philosophy, or a correct view of the subject.

Those animals that are well curried and rubbed, are only indebted for this grateful operation for the purpose of improving their appearance. The owners or keepers do not generally consider how important it is to the health and comfort of the animal. If they did, they would give some attention to their cows, young stock, and horses not at work, and not bestow all their attention in this way on a favorite and beautiful nag, that is often seen by the public.

The skin secretes a fluid that gives to the hair a bright, smooth, and glossy appearance, and the better prepares it to shed water. In order for these secretions to go on regularly, the health of the animal should not only be regarded in every other particular, but there should be frequently friction on the skin; it should not only be cleaned by the curry-comb and brush, but it should be rubbed also.—This gives a fine coat, which is an indication of health.

An important consideration here presents itself. Mothers wash their infants daily, and those who exercise judgment continue their health, when children, by giving them a good scrubbing in a tub of water, at least as often as once a week. And all persons who take proper care of themselves, bathe or wash the whole system often; though it is much neglected for want of thought or laziness. Now in cattle, cleansing is equally necessary for health, but washing, especially in cold water, would be improper; therefore, currying, brushing and wiping or rubbing the skin, should be practised as a substitute.

We have no doubt that every farmer, and every owner of stock, will acknowledge the truth of these remarks. But many will be slow to practise them; they will hear, but not understand, like the Indian princess who was required to marry against her choice.

Yet we trust that many sensible farmers who do not already practise, will get the combs and brushes, and set the boys to work; and take hold and give examples themselves, for boys will be inclined to slight the operation, if they have not been well educated in this way, especially if this new business substracts a few hours in a week from their play time.

See that the animals are kindly treated, particularly those whose bones, for no fault of their own, are very near the skin. Deal very tenderly with such as are uneasy under this operation at first, from having been so much neglected. They may be like the boy who, with his long frousy hair, could not see how people could bear to comb their hair every day, as he combed his only once a year, and then it almost killed him.—*Toronto Examiner.*

Advantage of Raising Good Stock.

Let us look for a moment at the raising of stock for market. Does it cost any more to rear for sale a good colt, than it does a poor one? Probably not five dollars more. The poor animal is a drug in the market at from \$60 to \$75, while the other will command readily from \$100 to \$200. Good horses are and will ever be in demand—are and will ever be sources of profit to the farmer, in a grazing district. But good horses will not come from poor stock and neglect. Constitutional peculiarities, family traits of health, strength, endurance, docility, &c., follow physiological laws as surely here as in the human race. If then the farmer would get profit from his horses in the market, he must make them enough an object of attention, that he shall raise only from good stock and with due regard to the laws of animal physiology.—*Granite Farmer.*

A Middling Cow and a Good Cow.

A middling cow will yield five pounds of butter per week, while a good cow will yield ten. Now offer both of these for sale—the middling animal being as large and handsome as the good one. How many purchasers, think you, will give fifty dollars for the one rather than twenty-five for the other?

Let us make a reasonable estimate. It costs thirty dollars a year to keep a cow, and the produce of a middling one is worth six dollars over and above the keeping. But your good cow earns you seven times six! She yields twice as much milk and butter, yet the cost of her keeping is the same as the other. Her earnings are seventy-two dollars; and if you deduct her keeping (\$30,) you have forty-two dollars for her annual profit—seven times as much as your middling cow!

Have we made any mistake in the figures? Let's try again:—Farmer A. keeps one good cow; farmer B. keeps two middling cows that yield just as much as A's cow (\$72.) A. deducts cost of keeping (\$30.) B. deducts cost of keeping (\$60.) A's profits, above the keeping in one cow, are forty-two dollars.—B's profits above the keeping of two cows are twelve dollars. One cow then would be six dollars.

Have we put a very uncommon case? Go into the yard of any careful farmer, who keeps twelve cows, and he will tell you that some of them yield twice as much as others on the same keeping.

Yet who will give fifty dollars for a good cow when he can have a middling cow for twenty-five. We answer, not one farmer in twenty. And this is the reason why so few are willing to devote themselves to the raising of stock. We have no bidders. Our people think the English great fools to pay such prices as they do, for first rate cattle. We may yet think differently.—*Ploughman.*

Digging Potatoes.

As the time for securing this valuable root is not far distant, it will be well for every farmer to avail himself of the benefits of early digging, which are neither small nor few.—Nine times out of ten he will save his potatoes from rot. The tops while green are worth more for the pig-yard or to cover on the ground than when dry. Potatoes dug in dry weather will be clean, and are worth for the market or to feed out more than those that are dirty.—Early digging gives the farmer a chance to plough, sow, draw off stone, or make any improvement upon his ground he pleases in the fall. It is often said, that potatoes keep better in the ground than out; and that dirty potatoes keep better than clean ones. This is true, provided there is nothing to keep them from the light or air but dirt. But potatoes put into the cellar the last of August or first of September, and well covered with old quilts, mats, or boards, will be far superior to those which lie in the ground and take the fall rains. Dirt was never made for food, for man or beast, and the bad effects sometimes produced by feeding potatoes to stock, is not attributable to the roots, but to dirt taken with them. In these superfine flour-eating times, almost every one is well supplied with flour barrels. These make first rate receptacles for choice potatoes. Would it not be well to fill and eat, instead of depending upon others for that which is not half so wholesome?—*Boston Cultivator.*

The best time to apply Paint.

It has long been a subject of enquiry, says an exchange paper, as to the best time to apply paint to the clapboards of houses for durability. Repeated experiments have been made, within twenty-five years past, which have resulted in the conviction that paint applied between November and March, will stand more than twice as long as that which is spread in the warmest weather. The reason is obvious for in cold weather the oil and component parts of the paint form a hard substance on the surface of the clapboard, nearly as hard as glass, and not easily erased, or even cut with a sharp knife, and will not soon wear off, whereas paints applied in the months of July and August, and more especially if in a severe drought, the oil penetrates into the wood like water into a sponge, and leaves the lead nearly dry, which will soon crumble off.

Westphalia plan of Smoking.

A room in a garret; fire in the cellar; smoke gathered in a tunnel and lead to the smoke rooms by a small pipe; by the time it gets there, all the heaviest part of the pyroigneous acid has condensed, and the smoke become cool. Nothing touches the ham but a pure, light, cool smoke, which is allowed to pass off by a number of small apertures, about as fast as it is supplied.—*N. Y. Farmer.*

Salt and Soot.

It is said that an important agricultural discovery has recently been made, showing that, by the union of salt and soot, a most valuable manure is produced. It has been found that land which usually produced twenty-five tons of carrots to an acre, when fertilized by a mixture of six bushels and a half of soot, yielded forty. This manure is also said to be very good for grain, and especially so for potato-land, which before had never produced more than one hundred and fifty-seven bushels to the acre, yielding two hundred and forty after having been manured by a mixture of thirty bushels of soot and eight of salt.