

NEW MODEL

Union Mowing Machine.

WEIGHT ONLY 525 POUNDS.

DRAFT ONLY 160 POUNDS.

The New Model Union Mower has been thoroughly tested during the season of 1872, and is now offered to the farming community as the **Lightest and Most Durable** Mowing Machine before the public.

The **Frame is made of Malleable Iron**, and is of such shape as to secure the greatest possible strength, while the material used throughout the machine, as well as the workmanship, is of the first quality.

All the peculiar features of the well known Union Mower, which have made it so popular, have been retained, while several very **important improvements** have been added.

To the friends of the "Union," as well as to others who contemplate purchasing a Mower, we say,

Examine the New Model Union
before purchasing any other, and you will be satisfied that it
HAS NO EQUAL.

NASH & BRO., Gen'l Agents,

110 Liberty St.,

NEW YORK.

COATES' LOCK LEVER HAY AND GRAIN RAKE.



The Lightest, Simplest, most easily operated & Best Rake known.

Any boy or girl capable of driving a horse can operate it with ease, as the tilting of the Rake is mostly done by the weight of the driver.

No effort is required to hold the Rake down to its work, as the "Lock Lever" secures it firmly to its place.

The teeth are manufactured from **Refined Cast Steel** made expressly for the purpose, **Tempered in Oil**, and each tooth is thoroughly tested at the factory. The cast steel coils, made with the body of the tooth, as these are made, are much stronger and more durable than small separate springs used in other rakes, and are less liable to get out of order.

With this Rake a boy ten years old can rake twenty acres per day, and SAVE ENOUGH GRAIN, usually lost, TO PAY FOR THE RAKE.

NASH & BRO., Gen'l Agents,
110 LIBERTY STREET.
NEW YORK.

NASH & BROTHER,

(Successors to DUANE H. NASH.)

Manufacturers' Agents,

No. 110 Liberty Street, New York.



BULLARD'S
IMPROVED
HAY TEDDER.

NANNY'S
SELF-OPERATING
SULKY HAY RAKE.

Agricultural Implements and Machinery of all kinds
at Manufacturer's Prices.

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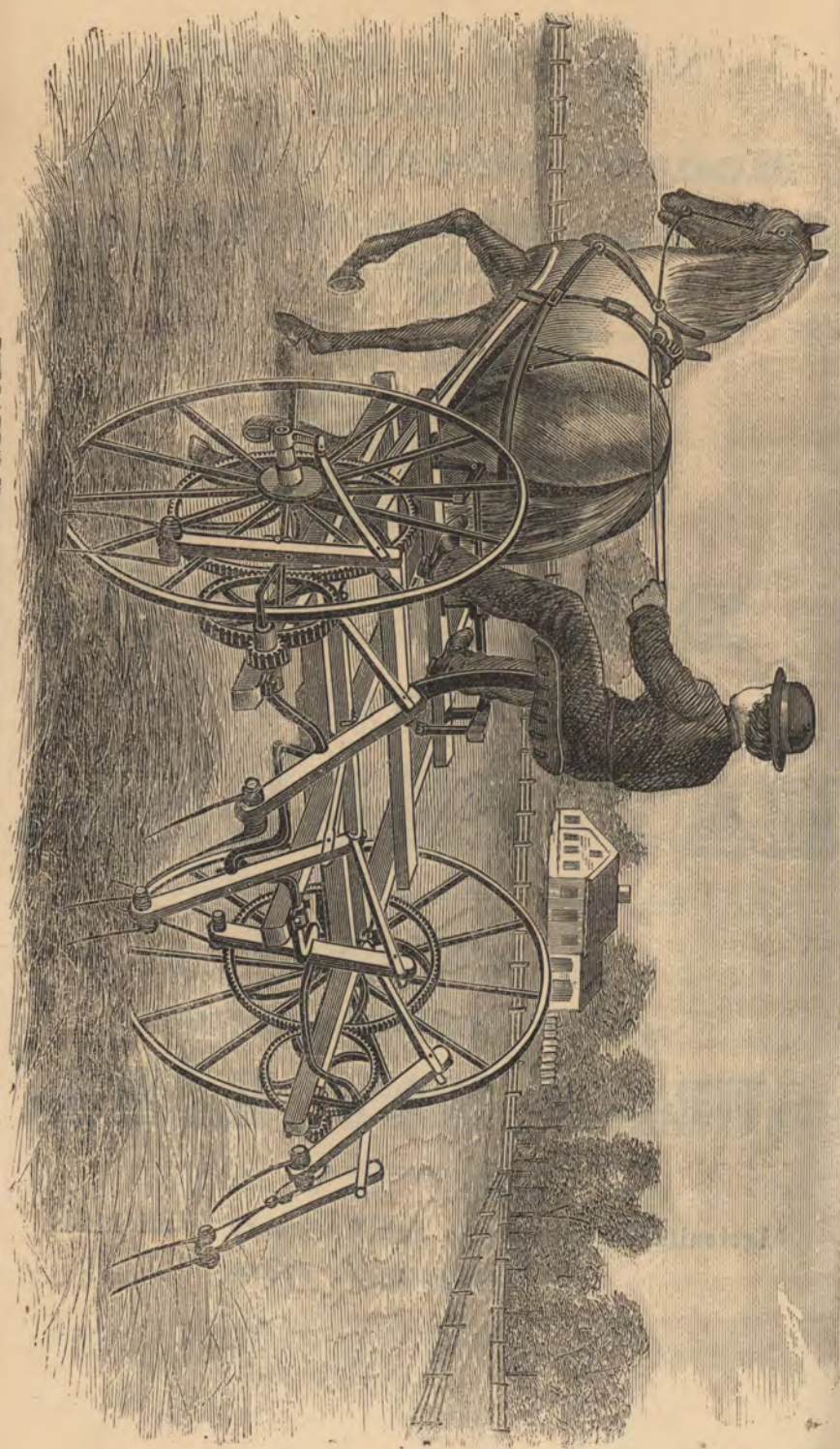
HAY TEDDER.

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Agricultural Implements and Machinery of all kinds
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BULLARD'S

Improved Hay Tedder

FOR TURNING AND SPREADING HAY.

As the hay harvest is a season of the greatest importance and anxiety to the farmer, the value of a first-class haymaker cannot be overestimated. Practical farmers who have used it are enthusiastic in its praise, and many place it before the mowing machine in point of value, and no farmer who uses a mowing machine can afford to do without the Hay Tedder.

The BULLARD HAY TEDDER having been submitted to the severest tests of field work, in this country and in Europe, is confidently offered to the farmer, as the BEST HAY SPREADER AND TURNER yet found possible to make. In fact it is admitted to be the *only one, yet offered to the public, that will thoroughly spread long, heavy grass, taking it up from the bottom, tossing it gently into the air, and leaving it upon the ground in a light, fleecy condition, just as a farmer desires to have it.*

The importance of cutting grass early, while in the flower, and before it loses its nutritious ingredients, is now admitted by scientific agriculturists, as well as by practical farmers throughout the country. If then, hay is to be secured while in the flower, the work of cutting and curing must be quickly done; and to do it quickly the grass must be constantly stirred after it is cut, in order that it may be dried in as short a time, and with as little exposure to the sun, as possible.

Grass, when cut with a mowing machine, is left evenly spread over the surface of the ground, but in a much more compact mass than when cut in the old way with the scythe. This thick, non-conducting layer of grass, absorbs much moisture from the damp earth, and cannot be dried unless *exposed to the sun* for a long time, and then the upper side will be *over dried*, while the under layer may still be damp.

The Tedder tosses up the grass lightly, leaving its fibres crossed in every direction, and in the best condition to be evenly and quickly dried by the circulation of air; and the curing can by this means be so hastened during any good hay day, as to allow the hay to be taken to the barn in the best condition, the same day that it is cut. But if the saving of labor be left out of consideration entirely, there is another point of greater importance to be kept in view, viz., the use of the Tedder improves the value of the hay secured, by from one to three dollars per ton.

It is Claimed for this Machine

That it will thoroughly turn and spread four acres of heavy grass in an hour, **THUS ACCOMPLISHING THE WORK OF FROM TEN TO TWELVE MEN.**

That it does the work so quickly, that the process of turning can be several times repeated, turning the hay so thoroughly **THAT IT CAN BE TAKEN TO THE BARN, IN THE BEST CONDITION, THE DAY IT IS CUT.**

That it enables the farmer to **TAKE ADVANTAGE OF FAIR WEATHER.** When the Tedder is used the mowing machine may be kept in the field until the middle of the afternoon, and at least **TWICE THE QUANTITY OF HAY BE SECURED, IN BETTER CONDITION,** than when allowed to remain in the swath.

That this saving of labor occurs at a period in the day when time is very precious.

That the grass when cured by this process, may be cut while in the flower, when it **CONTAINS ITS NUTRITIVE INGREDIENTS.** (See extract from Flint's work on grasses on another page.)

That its use improves the quality of hay, by at least ten per cent.

That by spreading from behind the wheels, *it does not run over and press the grass down after it is spread,* and by this means, leaves it in much better condition than other machines that spread only from between the wheels.

That it is the only Hay Tedder yet invented, that **INSERTS THE FORKS UNDERNEATH the hay,** and is therefore the only one that will **TAKE THE HAY UP FROM THE BOTTOM.**

That it is of **LIGHT DRAFT, NEVER CLOGS,** and manifests its superiority by the thoroughness of its work in **LONG AND HEAVY GRASS.**

That it is easily managed, and can be handled by any one capable of driving a horse.

That the machine is simple in construction, not liable to get out of order, and can be used on rough ground.

In short, its use in a single season on a farm producing forty tons of hay, will **PAY ITS COST.**

WARRANTY.

Each machine is warranted to thoroughly spread from three to four acres of grass per hour in the hands of a competent manager, and a fair trial will be allowed before settlement. If any defect is discovered immediate notice must be given to us or our Agent, and sufficient time allowed for putting it in order. If then the machine prove permanently defective, the money will be refunded, or a new machine furnished at the option of the purchaser.



No. 2, or 6 FORK MACHINE,

is mounted on wheels four feet high, and spreads about seven feet wide. This size is intended for, and can *easily be worked with one horse*. It possesses all the best features of the No. 1 Tedder, with several valuable improvements. These consist in making the frame more simple, and mounting it on wood wheels, four feet in diameter. By means of a lever the forks can be instantly regulated for any inequality of surface.

Price of this size, delivered on board the cars in New York,.....\$75.00.



No. 1, or 8 FORK MACHINE.

is mounted on iron wheels, 30 inches high, and spreads about nine feet wide. This size is intended for two horses, and is not as convenient to operate as the No. 2 Machine.

Price of this size, delivered on board of cars in New York,.....\$85.00.

Price of Evener and Whiffletree for No. 1 Machine, extra,.....\$3.00.

NASH & BROTHER, Gen'l Agents,

No. 110, Liberty Street, N. Y.

We could produce many hundred testimonials from practical farmers who have used the Bullard Hay Tedder, but want of space prevents. Our Agents are prepared to show testimonials from farmers in nearly every county in the Middle and Eastern States. The following letter and extract will show the drift of public sentiment, and those who want further proof, can satisfy themselves by making a trial of the Machine

TESTIMONIALS.

From the Western New Yorker.

THE HAY TEDDER.

You probably remember that last year I purchased one of Bullard's Hay Tedders for my own use, and proposed also to test it among the farmers, that they might learn for themselves whether it was really of as much value to the farmer as the manufacturer claimed. On conversing with many of our farmers I found that very few had any faith in it, and none thought it of any real value except in extra heavy grass, or when getting wet after mowing. I have now used it for two seasons and propose to give my experience as regards its value.

I have read considerable during the past two or three years in regard to its use and what is claimed for it—"That grass can be cut much greener, and cured in one half the time with it than without it. That a larger quantity can be cut and secured in a day, because you can get it dry and commence taking care of it much earlier in the day. That grass which it would many times be impossible to get dry the same day, but must be put up at night, can be cured with the Tedder the same day. That hay can be made in good order without one hour of sunshine upon it. That hay thus cured is much greener in color, retains its sweetness and flavor, and is consequently much more valuable for stock than when cured in the old way." To all of which, Mr. Editor, I am prepared to say AMEN;—and will test it for any one who doubts it, if they will furnish the material to work upon. You are aware that we have had "catching weather" for haying the past two weeks. During that time I have failed but one day of cutting and putting into the bunch or barn the same amount of hay that I usually secure in fair weather. That day we had occasional showers during the whole day, and I made no attempt. One morning after a heavy rain and during a heavy fog, which kept the grass perfectly saturated with water, I mowed two acres of timothy,—about $1\frac{1}{2}$ tons per acre,—went over it with the tedder twice, had it all put up at 3 o'clock, about half cured and in good condition for bunches, just in time to save a heavy rain, *without sunshine*.

The impression among the farmers that it don't pay unless hay is wet, is a mistake. Let the Tedder follow the mower as soon as possible and you will advance its drying from one to three hours, according to the amount of grass on the ground and the number of times you go over it. The tedder leaves the hay in a much looser condition than is possible for the fork. When it is necessary to put up the hay over night and open it before drawing, it can be opened without shaking as much as usual, pass over it immediately with the tedder, (taking about five minutes for a load,) and it will then dry at least one-third sooner for the shaking up it gets.

I generally cut about 20 acres of grass, and keep but little help, and I am satisfied that I have finished my haying full one week earlier this year than I could possibly have done without the Tedder; have got a nicer lot of hay than I have ever had before, and have not had a lock of hay bleached by water and sun this year. If your hay gets wet when it is half cured you can get the water out of two acres in two hours, without a ray of sunshine, get it as dry as before and put it up, and you would not judge from its appearance that it was ever wet.

The farmer with a Tedder is *never* afraid to cut down grass, for he *knows* he can secure it before it can get bleached. Small farmers need one quite as much as large ones, for they generally keep but little help. I obtained it at first thinking it would *pay*; I now find it to be at least twice the value to me that I supposed it could be, and of course call it a good investment.

Warsaw, N. Y. July, 1871.

N. S. WOODWARD.

We quote the following expressions of approval from letters received.

"At the trial I spread about one acre of heavy grass, say two tons or more to the acre. All who witnessed the operation were much astonished. * * * In fifteen minutes the grass was in better condition for drying than twenty men could have put it, in the same time. No amount of human testimony could have made me believe that the Tedder could leave the grass so light, flocky, and pervious to air, light, and sunshine." * * *

"I feel very independent, now that I have a Tedder. If I get a quantity of hay wet I can shake the water out very quickly, and have the hay laying up so light, that a little wind will dry it without the aid of the sun. Whereas my neighbor must wait half-a-day for the sun, and then has to open the hay by hand."

"If hay gets wet in the windrow, the worst of all ways to get wet, I can shake it up in no time, if opened from the cock, and needs turning, I can shake up a load in three minutes much better than with the fork."

"It saves me more than its cost every year."

"I consider that my Tedder paid for itself the first year."

"The Tedder, purchased of you, was sold with our farm. We shall purchase another for the coming season, if one is to be bought at any price."

"With the aid of a boy and horse my Tedder did the work of ten men. It is not liable to get out of order."

"I used my Tedder nearly every fair day during the month of July past on rough ground, in heavy hay, have made no repairs, and the machine is now as good as new."

"I consider the Tedder of more actual benefit to farmers generally than the mowing machine."

"At first I thought the price high, but I would not now do without one for several times its cost."

"I have used your Tedder six seasons, and would not exchange it for any machine on my place."

"Have saved the price of my Tedder in one day by keeping moving the hay, therefore being able to get it the same day, and avoid a long storm."

"Have used Bullard's Tedder six years. The cost of repairs has not exceeded \$1.50 per year, and it is in good order now."

"I consider hay cured with the Tedder worth at least \$1 per ton more than hay cured in the old way—it being cured with less sun and less dust in the hay."

"If it did not do more than one quarter the work it does, it would more than pay, for the reason that it does it so well. It saves as much labor as a mowing machine, and at a time of day when every moment is precious to hay makers."

"I have used the Bullard Tedder five years; and would not be without one for five hundred dollars."

We have many more of the same kind.

Extract from the Report of the Judges appointed by the New York State Agricultural Society.

"BULLARD'S PATENT HAY TEDDER, Entry 18, was very thoroughly tested in clover, in timothy, and in fine grass—in windrows as well as in swath. It received the unanimous approval of the judges, and we believe, of all the farmers who saw it in action. We think the introduction of this machine will be of the greatest importance to hay-makers. It certainly fitted the clover for going into the barn, at least one day earlier than would have been safe for clover which had not been subjected to its action. And every kind of hay, when worked over by the Tedder, was cured with much less exposure to the sun than would otherwise have been possible.

"The Machine tedded one acre of heavy clover, easily, in fifteen minutes, while the horses were walking at a natural gait (for the driver was not aware that we were taking his time), and four acres an hour was the average time in all the trials we made with it.

"The stirring of the hay was very complete; every portion of it was tossed rapidly into the air, and left on the ground, where it fell in a light, fleecy condition—just as a farmer would desire to have it.

"At least forty thousand of these machines ought to be sold this ensuing year, each of which would fully repay the cost of it before the season closed."

The Machine exhibited at this trial was one of the first made. Since that time great improvement has been made in the mechanical construction of the Fork and other parts.

The following from Hon. John Stanton Gould, Ex-President of the New York State Agricultural Society, will speak for itself:

HUDSON, April 13, 1868.

MY DEAR MR. HERRING:

"I studied the 'Bullard Hay Tedder' very thoroughly at the great Auburn trial in 1866.

"We tried it there under almost every possible condition, and it answered well to every test.

"The only objection we could make against it was, that it was carelessly made; the material of the machine was not as good as it should be; teeth of the spurs were ill cut, and it lacked that complete mechanical finish which so ingenious an invention richly deserved.

"I have seen it since then, and all these faults have been thoroughly remedied. It is now a machine such as a good mechanic loves to look at, and such as a good farmer loves to have in his hayfield.

"Those who have never used this implement, little they know how much they lose from the want of it. Those who have used it will never be without one.

"It is of great value in curing all sorts of hay; but for curing clover it is indispensable. It is light, strong, and durable; does not clog like almost every other form of Hay Tedder, and leaves the grass light and easily penetrable by the sun and wind.

"I cordially and heartily commend it to every farmer, and sincerely hope it will be as profitable to you as it assuredly will be to all who use it habitually.

JOHN STANTON GOULD.

"As this invention is comparatively new to the farming community, we give here in a few extracts from eminent agriculturists, giving the reasons for cutting grass early, and securing it with as little exposure to the sun as possible.

Extract from a Treatise on Grasses, by Charles L. Flint, A. M., Secretary, of Massachusetts Board of Agriculture.

After having given the testimony of numerous practical and successful farmers as to the best time for cutting grass, and having shown that grasses contain the highest percentage of sugar, starch, and gum, at the time of flowering, and that these nutritive constituents are gradually transformed into woody fiber, as the transition from the flowering to the ripening of seed goes on—he then adds:

"But there is another equally instructive suggestion to these transforming processes, and it is this: If grass is cut in a condition ever so succulent, and before the transition of sugar, etc., into woody fiber has commenced, there will even then be some loss of sugar and starch from the action of heat and moisture, especially if the grass is exposed to the rain in the process of curing, and lignification, or change to woody fiber, takes place to a considerable extent, dependent, of course, on the length of time it is exposed to the air and light; so that grass cured with the least exposure to the searching winds, and the scorching sunshine, is, other things being equal, more nutritious than grass cured slower and longer exposed, however fine the weather may be. In other words, grass overcured in the process of haymaking, contains more useless woody fiber and less nutritive qualities than grass cured more hastily and housed before being dried to the crisp. There can be no doubt which of the two would be most palatable to the animal. Some loss of nutritive elements, must, therefore take place in the process of curing, however perfect it may be, and the true art of haymaking consists in curing the grass but just up to the point at which it will do to put into the barn, and no more, in order to arrest the loss at the earliest possible moment. And this fact of the loss of sugar and starch, or of their transformation into woody fiber, by too long exposure to the sun and wind, I think equally well established as that any transformation at all takes place, and is equally suggestive."

Orange, Judd & Co., Proprietors of "American Agriculturist."

HAY TEDDERS.

A correspondent in Missouri asks, "What is a Tedder?" and states that the latest dictionary does not give any meaning to suit the word. A Tedder is an implement which "teds," and the definition of ted is "to spread or turn as new-mowed grass from the swath and scatter it for drying." The Tedder is the latest addition to the list of improved haying implements, and it is not at all strange that a knowledge of it should not have reached all parts of the country. With the Mower, the Horse-rake and the Horse-fork, the farmer was nearly master of the situation, and it only needed the Tedder to enable him to secure his hay in almost his own time and with but little re-

gard to the weather. Almost every one who has worked at hay-making has been employed in stirring hay—opening the swaths or windrows to expose every part to the drying influence of air. The Tedder does this in the most complete manner, and by the use of horse-power performs the task with ease, rapidity and thoroughness. There are several different Tedders in the market, and without disparagement to others we give an engraving of Bullard's patent, being we believe the oldest, and also one which has given general satisfaction to those who have used it. The engraving shows the construction so well that but little explanation is required. There are six forks, to which motion is communicated by means of gearing attached to the wheels of the machine. The action imitates as nearly as possible the motion of a fork in the hands of a man, forkful after forkful is pitched up with great rapidity and thrown into the air, and falls in such a light condition that the air can reach every stem and leaf. It is well known that the best hay is made from grass cut just at flowering time; and it is equally well known that grass cut at that time is more succulent and more difficult to cure properly than that which has progressed further towards ripeness. The use of the Tedder allows the farmer to cut his hay when he pleases, and to cure it rapidly and properly without overdrying. Hay-making cango on in cloudy weather—indeed the best product is obtained when the hay has been air-cured rather than sun-dried. The testimony of all who have used a Tedder is strongly in its favor as a valuable auxiliary in the hay-field.

"From the New York Weekly Tribune."

THE HAY TEDDER.

* * * * *

The advantages of a tedder like this are threefold:—

1. It enables the farmer to cut his meadows when "grass is grass," when the timothy, clover, foxtail, fescue and red top have the dew of youth upon them, before they come to the "sere and yellow leaf," when the gums and the sugar, the starch, and the substance is all there, not exhausted in the seed, not blanched out by fierce suns, or drenched away by July showers.

2. It substitutes horse power for boy or man power, thus releases muscle for other forms of industry and young minds for the drill of the village school.

3. It advances hay-making, and enables the farmer to mow away in a direct, fragrant, well made condition every afternoon all that was cut before 11 o'clock in the morning of a sunny day. Other styles of tedders are in use. But the insuperable objection to the revolving wheel, armed with forks, is its liability to wind hay around the drum or the axles, and thus clog and tangle the machine. This happens when the tedder is most useful, in heavy grass, when the stocks are much interlocked. In the system of forks acting back and forth only, no such difficulty can arise as there is no revolving motion. The general use of the tedder in co-operation with the mower and rake has condensed the hay-making season within the last week in June and the first and second weeks of July. Of old, under the regime of the scythe, forks, and hand rake, haying dragged its weary length well into August, and sometimes light frost in early September blasted the thin tufts of juiceless grass on neglected mow-lands.

The change wrought by these implements is giving us better hay, more of it, earlier cut, sleeker stock, and more prosperous husbandmen.

Mr. X. A. WILLARD says in the "*Rural New Yorker*."

To make good hay, proper attention as to the cutting and drying must be observed, and the application of no substance in the mow can be used as a substitute for certain operations in the field. A good hay tedder in the meadow is the best means of getting rid of moisture and in providing against musty hay. Recommendations for curing hay in the mow by the use of salt, lime, &c., are of very doubtful expediency, and for the most part do more hurt than good, since many persons will store their hay in a half cured condition, depending on the salt or lime to do what can only properly be done by well directed labor in the field.

The making of good hay is an art very imperfectly practiced, as the condition of stock in spring often bears witness. There are many old farmers who seem to have very poor notions in reference to cutting, curing and storing hay in order to secure it in the best manner, and so that it will contain the most nutriment. Immense sums

are annually lost to the country by carelessness and inattention in properly securing the hay crop. A good deal of hay stored is no better than straw, and not from any fault of the weather, but because improperly cured, or left standing until the stems had become too far changed into woody fiber.

There are seasons and times when it is very difficult to cure grass properly; but even in bad weather the judicious management of the spreader and hay cap is to be preferred to curing in the mow with the salt. And it is a question whether lime might not also prove injurious to stock when used in sufficient quantities to be serviceable in curing hay in the mow.

From a letter to the "Country Gentlemen."

* * * * *

Having become satisfied that it is best to cut grass for hay much earlier than formerly, by two years previous experience, before cutting my grass last season I procured a Hay Tedder. My grass, was mostly clover and herds grass, averaged over 3800 lbs. to the acre cured hay, and being cut very green, required a good deal of airing to fit it for the barn; but the Tedder did its work to a charm, so that most of the grass was cured and housed the same day it was mowed. A small boy, with a light horse operated the Tedder, going over some fields three times, though generally but twice.

* * *

From the "Rural New Yorker."

The hay tedder is under-estimated, high as it is held. By-and-by it will be found that it is one of the principal agents in agriculture, one of the best paying for the investment, and indispensable in curing green, early-cut hay.

From the "Cultivator."

A hay tedder is a machine that every farmer must and will have, of necessity, if not from choice—of necessity, we say, for it is already demonstrated, and that, too, beyond a doubt, that a machine that can be worked in the hay-field by one horse and a boy ten years old, and do the work meanwhile, of ten men, in spreading, stirring and turning the new mown grass, is one that cannot, should not, and will not be neglected, but must, and will be had, on the score that no one using the mowing machine and horse rake can afford to do without a tedder. We predict, therefore, that there will be ten hay tedders bought and used this year, where one was last. There is no use in putting it off, haymaking farmers, for the longer you do so the poorer you will be. "Science with Practice," "Progress and Improvement," "Excelsior," are some of the mottoes of live farmers. *It is no longer a question whether the hay tedder will do what is claimed for it, any more than it is in regard to mowing and reaping machines, or the horse rake. Therefore we should thus timely suggest to farmers, to those who have not already done so—order a hay tedder, and in so doing, be sure to "get the best." That's what we did last year, which enabled us to do with one horse and a boy, what it would have required ten men to have done less perfectly in the same time. Says a Green Mountain farmer, "a tedder will pay for itself on a farm where one has fifteen tons of hay to get." It is an old adage, "Make hay while the sun shines," and it is a very good one too; but it is verily believed by some, with but little sunshine, and much tedding grass may be cured so as to keep well in a barn, that otherwise would remain out until nearly or quite, spoiled by weather. Again we say, get a hay tedder, and mind and "get the best."*

Nutrition in Hay, How Lost, How Retained.

The haymaker cannot be too solicitous to dry hay as rapidly as possible, because the natural coating of wax which envelopes the plant in its dry state is cracked in wilting, and if rain or dew falls upon it in this state, a portion of it penetrates to the inner tissues of the grass and washes out some of its most nutritive constituents; but this is not the only mischief. When in a viscid or dry condition the colloid waxy, starchy, and sugary matters will react upon each other only in a very slight degree, or not at all; but when water, whether from rain or dew, enters into it, very injurious reactions are set up, which cause an active fermentation among the carbonaceous and albuminous compounds which throws off a great amount of nutritive matter in the form of alcohol, ethers and in some cases of acetic acid.

Grasses differ in the amount of water contained in them, but it may be stated that the average of our meadows will give 109 lbs. of hay for 387 lbs. of grass. Hence, if there is *no nutriment lost* in the conversion of grass into hay, a cow that will consume 100 lbs. of grass ought to do as well on 25 lbs. of hay, since this is the equivalent of 100 lbs. of grass. But according to the experiments of Dr. Thompson, which were conducted with the most scrupulous accuracy, and which agree very well with other experiments that have been made at various times upon the same subject, a cow requires over and above 25 lbs. of hay, the daily addition of 9 lbs. of barley to keep her in the same condition for giving milk or laying on fat as she had when fed on grass. This, therefore, is the measure of the loss of nutritive matter that occurs during the conversion of grass into hay by the ordinary average process employed by farmers, viz.; *a loss of nutritive matter equal to that contained in 9 lbs. of barley.*

"There is nothing more desirable to avert these losses than the rapid drying of the grass and with as little exposure to the glare of the sun as possible. The free circulation of the air through the grass is the best possible mode of accomplishing this object, but you will readily see that in the ordinary way of hay making one side of the grass is burned to a crisp, while the side lying contiguous to the moist earth is surcharged with fluids. This is a most undesirable state of things, because it gives all the conditions for very unfavorable chemical reactions that should be guarded against. *Both sides should be well dried, but not dried so as to be brittle and crack.*

An implement which has recently been introduced to the American farmer is of incalculable advantage, and enables him to dry hay rapidly and in the best possible manner with great convenience and economy. We allude to the Bullard Hay Tedder. "The farmer should bear in mind what has already been said, that it is undesirable to break the waxy coating in any event, and in a more especial manner when it is to be exposed to rain or dew. This machine spreads the grass thoroughly, and operates with out tearing or breaking the coating of the grass. An examination of the machine will show that it takes hold of the prostrate grass by a forward diagonal movement of the forks, and tosses it lightly and rapidly into the air, thus avoiding breakage of the coating, giving it the advantage of an artificial current of air, and reversing its position on the ground. This machine never clogs when at work, and its mechanical work is very good, accurate and durable. Others do not insinuate their forks underneath the grass and toss it up as this does, but strike it violently, lacerating the coating and frequently by its violence causing the grass to wrap itself around them, and thus become clogged.

How to make good Hay.

A correspondent of the "Country Gentleman" says, I give my experience in this matter, and submit it to the criticism of my practical friends.

I lay down as a principle that good hay should be green. If cut grass were immediately dessicated, or dried artificially, it would be green. It is the long exposure to the sun's rays that takes away its color and give evidence of its improper making. I lay down as another sound theory that grass immediately after cutting should be either flying in the air by means of a machine, or be on the cock.

As fast as the grass is cut it is immediately sent flying into the air, we keep on at this all day until the approaching fall of dew, before which time it must be put on the cock, for the dew is almost as bad as rain. * * *

Grass, after cutting, should never be allowed to lie on the swath or rake row, or lie spread over the ground. The damp earth prevents its making. * * * It is easy to understand this, for in dry weather you will always find damp under any covering you may put over the soil. I commend this question of flying in the air or of putting on the cock. * * *

It is easy to understand that in scattering the separated blades of grass high and rapidly through the air is, in fact, like blowing a gale of wind through them, and the grass is thus quickly deprived of the moisture without losing its color and quality by long exposure to the sun's rays. * * *

Can Hay be cured in Rainy Weather?

A correspondent of the "Cultivator and Country Gentleman" says:

"I fear that the use of the Hay Tedder is not generally appreciated. While at our County Fair I witnessed the operation of one under circumstances that went far toward establishing their real value. The operator took grass that had been mowed and laid in its swath eight days, without six hours sun shine upon it during that time, and had been rained upon nearly every day; it was green, wet, and sour. About two heaps of it were spread out in thickness of about four tons to the acre, the tedder passing over it every few minutes for about three hours. When he commenced operation it rained so that the farmers held umbrellas over their heads, and laughed at the operator for making hay when it rained.

This was about noon, and it soon stopped raining and the wind sprang up a little, and at three o'clock that hay was dry enough to go into any barn. All this was done without a particle of sunshine.

I thought myself, if so much could be accomplished by constant use in so foul a day, how many thousands dollars worth of hay could have been saved in this past, unprecedented wet and cloudy summer. I think our farmers will soon find out that they cannot afford to do without a Hay Tedder."

From the "Evangelist."

The Hay Tedder. The Food Value of Hay.

Farm produce cannot long remain so high as it has been for some years past. The profits of farming must be sought rather by cheapening the cost of production than by fruitless efforts to maintain former prices. Agricultural machinery must be made to do the work hitherto done by hand. Reapers, mowers, horse rakes, and patent hay-lifters, have been long in use and have done well. Each has come to its present improved state by slow degrees, as all nice machinery for rough and tumble purposes always must. The reason for this lies in the established fact that use suggests improvements which no human ingenuity could see.

The Hay Tedder has had less experience in the field than any other machine named. It was first like them, in a transition stage, and an awkward affair. * * *

Nevertheless we saw that in the invention of the Bullard Hay Tedder there was genius. We fully believe that out of the same brain that had conceived this machine, as it then was, would, ere long, come a machine (improved little by little, as its use in the meadow should indicate) which would be a wonderful solace to the farmer of grass land amid his severest toils. * * *

The Bullard Horse Hay Tedder, as seen in agricultural warehouses of this city, is now about as near perfection as anything human can be. Whether there are other tedders of equal value in the market, we are not informed. That this is a good one, we feel assured, and that farmers of grass land would do well to supply themselves with the best in good time, there can be no doubt; for we are informed that the supply is likely to be short of the demand.

The advantages of the hay tedder are many. It enhances the value of the mower, of the horse rake, and of the hay-lifter. These four constitute a regular hay-making quartette, and the music of the meadow drags if one part be missing, especially if the old man of seventy years or the smart boy of ten, be not riding in the arm chair of the tedder, stirring up, airing and fitting for storage, from eleven A. M. to three P. M., the hay that was cut from six to ten in the morning.

There is another advantage. Hay cut in the blossom, before the seed will shell by handling, is better than if cut either sooner or later, and by the aid of the hay tedder, the whole crop can be secured nearer the best time for cutting. The sooner you can store it after being cut, the better the quality. Every body knows that herbs long dried in the sun lose their best medicinal properties. It is much so with hay. If long exposed to a scorching sun, it loses a considerable part of its food value. The hay tedder enables the farmer to store it on the day it is cut, except in cases of heavy grass, or of unfavorable weather. It saves as much in labor, as any other machine, not even ex-

cepting the mower, and saves nearly or quite as much more in the better quality of the hay. Four men and an active boy, ten or twelve years old, or an old man able to do but half a day's work in a day, will begin and finish the hay-making of a farm, with the Bullard hay tedder, as soon, at least, as seven men without it, thereby saving twice and a-half the wages of a man per day, and gaining as much more in the better quality of the hay. When the price of labor next July, becomes known the benefit of the hay tedder may be esteemed as highly by men who have not yet used it, as it now is by those who have.

HAY AND HAYMAKING.

This crop is one of the most important in our country, and the greater its value, the greater becomes the importance of cutting it at the best time, of curing it in the best manner, and of storing it so soon after cutting as to reduce the risk of its getting wet, when partially dried, to the lowest possible point, as a wetting not only injures it badly, but greatly increase the labor of drying it.

The best time for cutting I believe to be when the blossoms are yet fully expanded and a few of the earliest are beginning to fall, when the seed is in the milky state, not so far advanced as to be shelled and lost in the field.

If grass be cut in the morning between six and eleven o'clock, and be left on the ground as it falls, untouched, until the dew is wholly off and the exposed parts considerably wilted, if it be shaken up, left loose and tolerably evenly distributed over the whole surface, and stirred frequently from that time, say 11 o'clock A. M. to 3 P. M., it will be fit for storing, provided the day be passably good and the crop not remarkably heavy.

To cut grass in the morning, to make it into hay by 3 o'clock P. M., and to have it all packed in the barn, *in good order*, by sundown, could not have been done forty years ago. The requisite implements did not then exist. It can be done now, for we have the machinery to do with.

But what does "good order" mean when applied to hay? That it should be sunned to death? No. That it should be made as dry and hard as rye straw and but little more nutritious? No. That it may be put into the barn or stack so wet with dew or rain that it will give a musty odor all the autumn and smoke as often as touched all the winter? No. It means none of these; what it does mean is, that hay should be perfectly freed from all dew or rain but not of its natural juices. Rain and dew mould it; rot it if quite wet with either, and cause it to smoke whenever handled in winter. The natural juices do not; they cause a gentle, temporary fermentation changing the color from dark to a lighter green, for which the hay is all the better, tenderer, more easy of digestion and more readily assimilated into the animal economy, to come out in forms of milk, meats, butter, cheese, strength to labor, tallow, wool, etc., etc.

Hay, if free from water by dew or rain, may, with few exceptions, be stored on the day the grass is cut. By the aid of the hay-tedder it can be, and be worth from ten to twenty per cent. more per ton than it possibly can be by the old, long-lasting process of sunning day after day, as practiced when this old farmer was a boy. J. A. N.

From the "American Agriculturist."

MOWING MACHINES and Horse-rakes are indispensable adjuncts to meadow farming. The Horse-fork is nearly as important, and the Tedder is fast asserting its claims. Bullard's Tedder of this season, we think, surpass those previously introduced in strength, handiness, and ease of draft.

From the "Rural New Yorker."

The introduction of a useful machine often creates a necessity for others; for example, the invaluable and indispensable mowing machine leaves the mown grass quite evenly spread. Yet it requires to be respread and aired, in order to cure it in due time, and to spread it by the old hand process, with the scarcity and expensiveness of manual labor of late is impracticable, hence, a necessity which called into use the horse tedder, which is really one of the most economical machines in the whole catalogue.

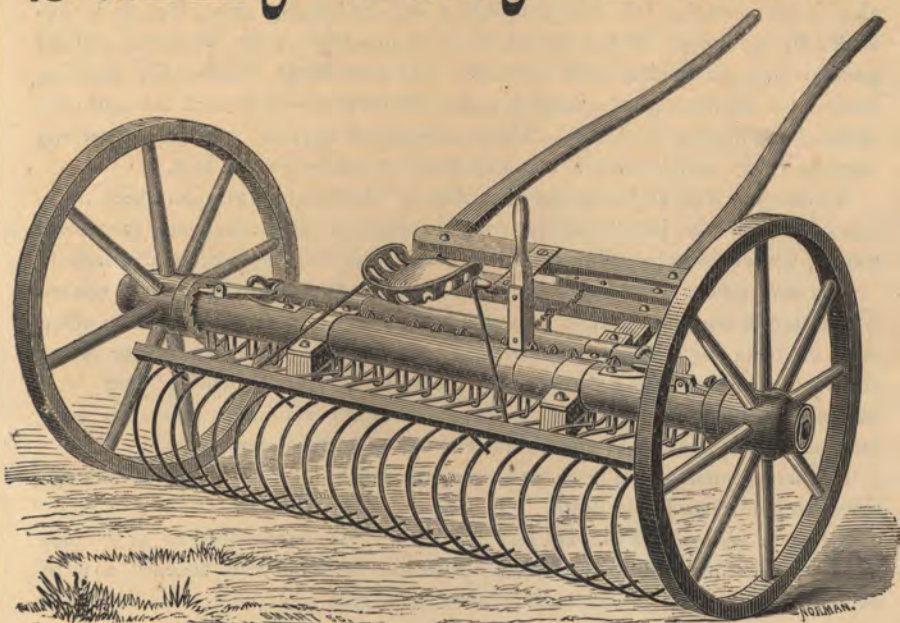
'From the Country Gentleman.'

BULLARD'S IMPROVED HAY TEDDER.

An illustration accompanying this article represents the above-named implement which has heretofore been frequently commended in our columns. It is not alone its value in curing hay in rainy weather, that renders it important to the farmers, but also the great fact that underlies the making of *good hay* in any weather, namely, that it should be quickly and evenly cured. Hay that is subjected to successive dews and burning sunshine for two or three days, is a very different article from that which is promptly deprived of all superfluous moisture and at once protected from farther exposure. Hay that is partly well cured and partly spoiled in the curing involves loss just in proportion to the imperfection of the process employed. Under the most favorable circumstances, with the grass well scattered about by the mower, there will be tufts of it all over the field, the top of which is sufficiently dried by the sun, while the bottom is as wet and green as when first cut. The only way to render the drying uniform and rapid, is to give equal access of sun and air to all parts of the product. This is done by the Tedder, which opens up and loosens the bunches of grass, lifts them all into the sun if it be shining, and at any rate exposes them throughout to the air and leaves them loosely, so that every current helps in carrying off the water contained in the leaf and stem, and promotes the security and good quality of the whole.

Of the various Tedders before the public, Bullard's is one of the most ingenious, and has been one of the most successful. It is of light draft; the wheels do not run over the grass after it has been spread; the forks *lift* the grass into the air, by a sudden movement which does not tend to entangle or compress it, and it is simple and easy of management. It has been used with the greatest satisfaction in some of our leading dairying districts, and the principles involved in its construction have had the approval of the best judges. * * *

NANNY'S Sulky Hay Rake.



No Farmer can afford to do without one of these

IMPROVED Self-Discharging Steel Tooth Hay RAKES.

Manufactured of the best Material throughout.

A Boy or Girl can rake twenty acres per day,
and in gleaning after the Reaping Machine
can save grain enough, that is usually
lost, to pay the entire cost of the rake.

Farmers should examine this Rake before buying any
other, as it is true economy to buy the best.

This Rake is the result of four years experiment, and having been submitted to the severest FIELD work, is now offered to farmers as the VERY BEST implement of its class in the market. It is what is termed a self-discharging rake, viz., it is unloaded by the horse. When the rake is to be unloaded at the windrow a slight pressure with the hand or elbow operates a rock shaft which throws the dumping levers into ratchets on BOTH WHEELS, and as the horse moves forward the teeth are elevated and the hay discharged. THIS ARRANGEMENT PUTS ALL THE LABOR UPON THE HORSE SO THAT A BOY OR EVEN A GIRL CAN OPERATE THE RAKE WITH EASE.

All the objections heretofore raised against self-discharging rakes have been overcome. There is no liability of scattering the windrow, as the teeth are raised instantly, the wheel only making a small advance while the hay is being discharged.

The very serious objection of side draft in other self-discharging rakes, is entirely obviated in the Nanny Rake, as both wheels operate when dumping. In other rakes the teeth rise and fall automatically, cannot be controlled by the driver and often fall back before the windrow is passed striking into and scattering the hay. In this rake the teeth MAY BE RETAINED IN AN ELEVATED POSITION AS LONG AS DESIRED, or may be allowed to rise and fall automatically.

The arrangement of the lever for keeping the teeth to their work, enables the driver to hold them firmly down.

The teeth are made of the very BEST QUALITY OF STEEL, are shaped so as to pass underneath the hay and do not scratch up the stubble. They are fastened so as to be easily detached, and are entirely independent of each other, in fact IT IS THE ONLY STRICTLY INDEPENDENT TOOTH RAKE made.

The wheels are 54 inches high and will allow the axle to pass a large windrow or obstruction.

An arrangement for clearing off the teeth is provided. All the parts are made of the very best quality of material, and no pains or expense is spared in putting them together.

We mean that it shall be the very best Steel Tooth Hay Rake both in principle and manufacture ever presented to the consideration of the American farmer.

Prices delivered on cars in New York :

<i>Rake complete with self discharge,</i>	-	-	-	\$44.00
<i>" without</i>	"	"	-	\$40.00

NASH & BRO.,

110 Liberty Street.

WARRANTY.—Each Rake is warranted to be well made, and capable of raking from three to four acres per hour, in the hands of a competent manager. A fair trial will be allowed before settlement. If any defect is discovered, immediate notice must be given to us or our agent, and sufficient time allowed for putting it in order; if then the rake proves permanently defective, the money will be refunded or a new one furnished at the option of the purchaser.

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Was Awarded to the

BULLARD

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