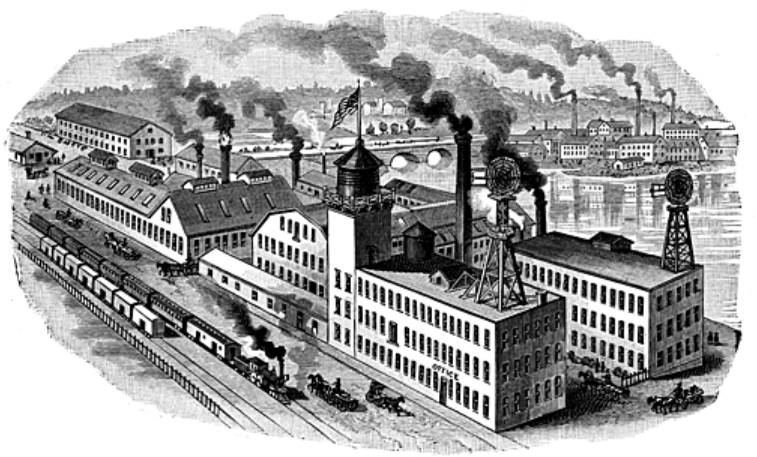
1889

U. S. Wind Engine and Pump Co.

Omaha, Neb.



Factory and General Office, Batavia, Ill.

THE HALLADAY STANDARD WINDMILL

In Sail. Out of Sail

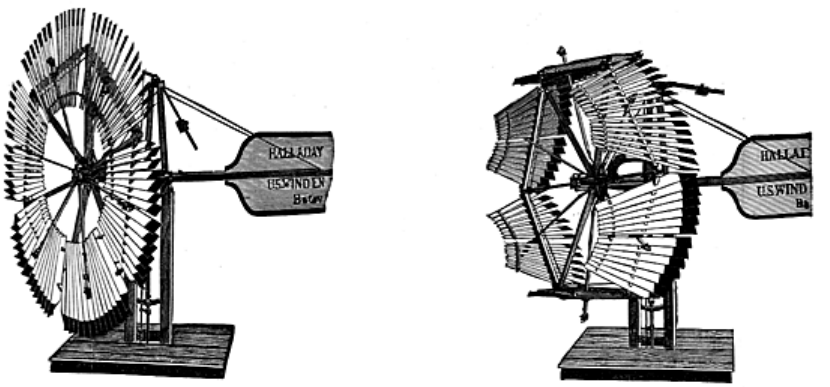


Fig. 1234.

THE U. S. SOLID WHEEL WINDMILL.

In Sail Out of Sail

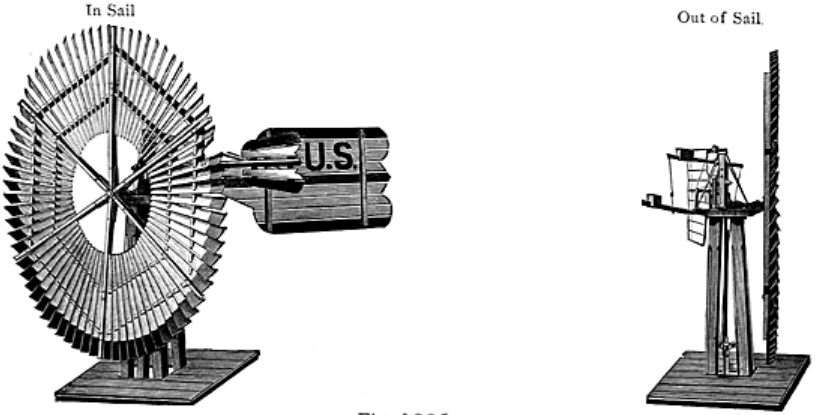


Fig. 1235.

Send for our Special Windmill Catalogue with Testimonials and further particulars.

For Prices, See Pages 471 and 472.

WINDMILL TOWERS.

PLATE. LXV.

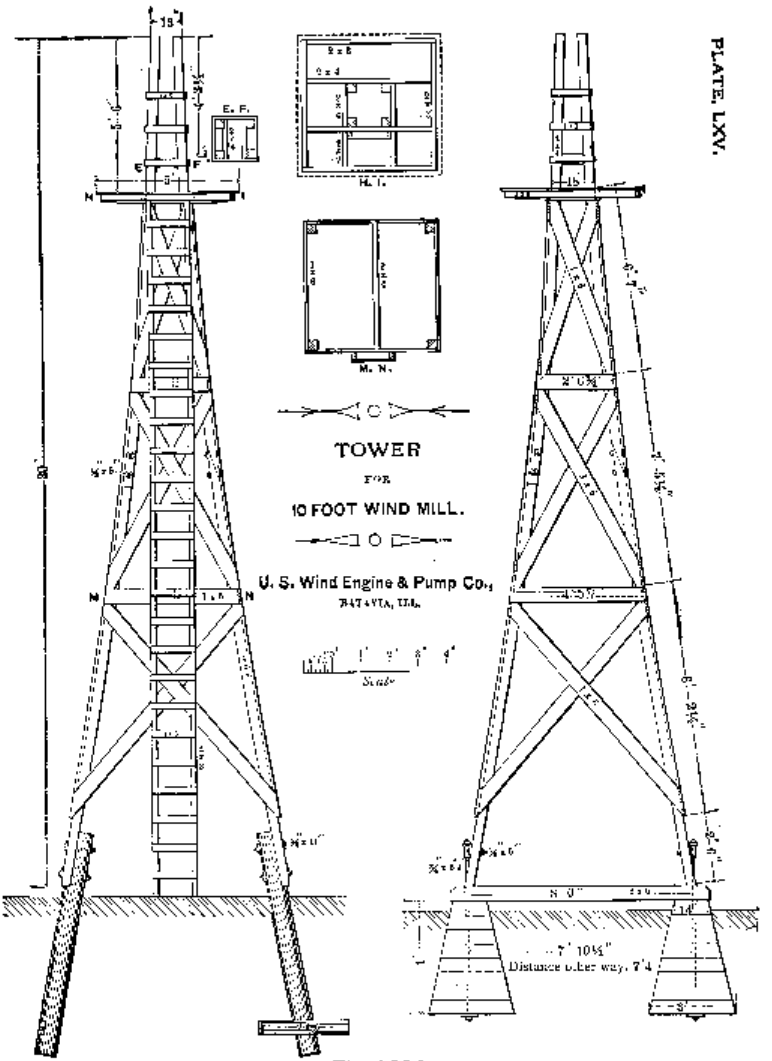


Fig. 1236.

The above illustration represents our standard make of Spring Tower for 10-foot Halladay and U. S. Solid Wheel Mills. We furnish these towers with the platforms framed and nailed together, the corner-posts spliced and fitted to bed-plate, and the girts cut to length. The ladders and braces are furnished in place stuff and all lumber is dressed. We also furnish all nails required for putting tower together, and the bolts for bolting to anchor posts, but not the posts unless specially ordered. These towers are made the following standard heights:—30, 35, 40, 45 and 50 feet.

PRICES.

Per foot, in height, not painted ..... .60 Per foot, in height, painted 1 coat ..... .75

Plans and bill of material for any size Mill furnished on application.

DESCRIPTION OF THE IMPROVED HALLADAY STANDARD WINDMILL.

It will not be necessary to enter into an elaborate description o. the mill in detail. What we wish is to make plain the construction, operation and points of merit which make the Halladay Windmill so perfectly manageable, storm defying, powerful and durable. In doing this we will make use of the cut on following page.

A, the bed-plate, is a strong, circular casting, resting on two masts M' in the tower, and firmly bolted to them, and further secured by means of two wrought iron braces, E. Upon this bed revolves the turntable, B, held in position by four strong clamps. Anti-friction rolls are provided for the turntable to turn on. They are very durable and require no oiling, and the form of the bed and turntable are such as to completely cover and protect the rolls. The slightest breeze will turn the mill head to the wind. The spider casting, to which the arms, A', are bolted, is keyed firmly to the main shaft, S, and is heavy and strong.

At F' are shown the sails, which are pivoted to the arms, A'.

The shaft, S, rotates in babbitt-lined boxes, and has a crank-plate, M, keyed to its inner end. To this is attached the pitman, I,. This crank-plate admits of several different lengths of stroke.

By means of the mast attachments, consisting of sleeve box, S', swivel box, X, and sliding boss, Z, connection is so made between pitman and pump that the revolving of the turntable upon the bed will not twist or cramp the connections or prevent sails being spread or furled, by means of the shut-off rod, R, which is operated by a lever at the base of tower.

The great peculiarity and main point of success in the Halladay Windmill is the arrangement of its regulating gear, consisting of the sliding collar, D, front plate, C, elbows, Y, and their connections. Rods connect the collar, D, with front plate, C, wrought links connect front plate, C, with elbows, Y; connection between elbows, Y, and sails, F', is made by regulating rods, R', and the rod, R', forms a connection between the lever, P, forked lever, F, and shut-off attachment.

On the outer ends of the regulating rods are governing balls, W', called regulating weights, the action of which is the same as governor on a steam engine, causing the sails to present less surface to the wind as its velocity increases.

The weight, W, on lever, P, acts in opposition to regulating weights, causing sails to present more surface as the power of the wind lessens, thus making the mill storm-defying, and enabling it to attain a uniform motion in all the varying velocities of the wind. The sails may be furled and mill stopped, and made to stand still by pulling down on the shut-off rod, R. It will be seen that the regulating gear is very simple, securing a direct connection with each sail, and direct action of the regulating weights on the sliding collar and its connections, thereby giving positive movement to all the parts; and as these parts are only acted upon when the wind is so strong as to have a tendency to run the mill faster than the maximum speed, the wear is very light upon them. The elbows, Y, have long bearings. All parts are proportioned to sustain the strain and wear required of them, and ample provision is made to take up all wear, so as to keep the sails rigid and prevent any rattle or noise. Language cannot make you fully appreciate the beautiful movement of this device. You should be an eye-witness to the manner in which it regulates itself in all kinds of storms. At a trifling expense the mill may be arranged to stop itself when the tank is full, and of itself to resume work when water is used from the tank, thus preventing unnecessary wear, and appearing more like a thing of life and intelligence than a mere machine. You will find it no rude built, unsightly thing, but really beautiful and ornamental, and the most durable machine of the kind in the market.

Every machine being made of the best material, by skilled mechanics, and machinery especially adapted to the work, we have won for the Halladay mill a title it justly merits, "The Standard."

THE IMPROVED HALLADAY STANDARD PUMPING WINDMILL.

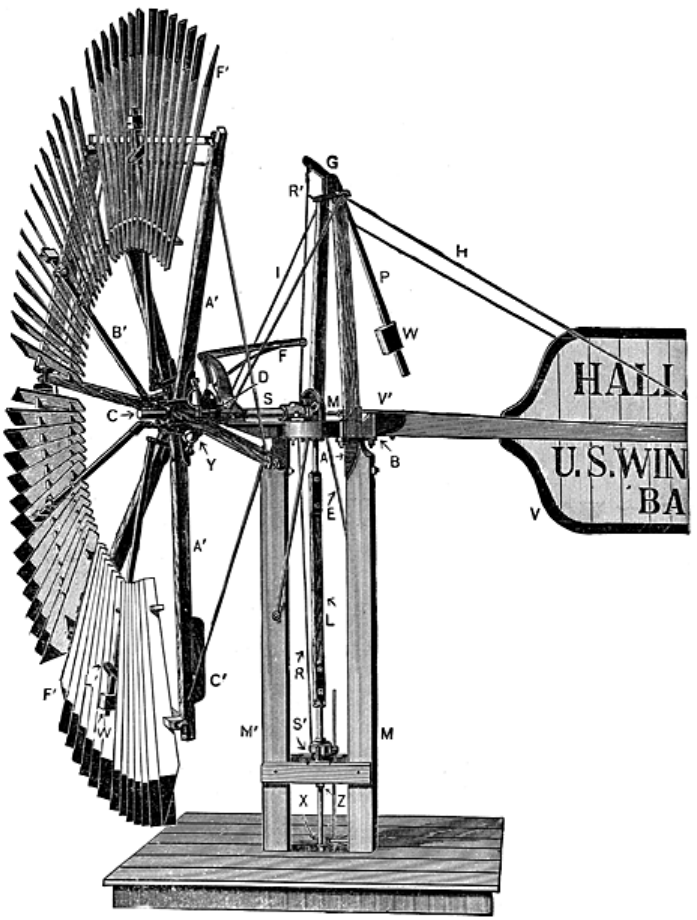


Fig. 1237.

DESCRIPTION OF THE U. S. SOLID WHEEL WINDMILL.

(Secured by Letters Patent.)

The Bed-plate is a strong circular casting firmly bolted to four masts. The turntable completely covers the bed, and is held firmly in place by means of three strong clamps projecting under the bed.

The turntable revolves upon the bed on anti-friction rolls, which are completely protected from the weather, turn very easily, require no oiling, and are durable.

The bed and turntable are made large in diameter, admiting of the use of a large crank plate and long pitman, thus giving a long stroke to the pump without causing the side thrust and strain produced by short pitmans. The mill is therefore adapted to be used with tubular well pumps without the use of walking beams or levers.

The turntable being large in diameter, allows of a tall and well-supported truss frame, which gives a thorough and substantial support to the main vane V. (See cut on following page.)

The main shaft is made extra strong, and rotates in babbit-lined boxes, forming broad bearings with heavy caps, thoroughly bolted to place.

The spider, S, is strongly keyed to outer end of main shaft, and the crank plate to inner end.

The arms, A, are securely bolted to the spider, and have the fans, F, firmly bolted to them by means of special angle clamps.

The main vane, V, has its inner end bolted to the socket, X, which is made of malleable iron and hinged to the turntable and truss frame with broad bearings.

T is the side vane bolted to the truss frame and farther supported by means of the rod secured to the top of the truss frame.

L and W are weights attached to the top and forked levers, and are adjustable, being secured by means of set screws.

The forked lever is fulcrumed to the turntable, and has a link connection to the main vane.

A connecting rod joins the two levers, and the inner end of the top lever is attached to to the furling rod reaching down through center of tower and connecting with a hand lever, the connection being so made as to prevent the rod twisting or winding up when the wind mill revolves on the bed-plate.

Thus the furling apparatus is very simple and durable, having no *pulleys* or *chains* only levers with plain rod connections.

The weight, W, is so adjusted as to hold the wind wheel face to the wind till it attains its maximum speed.

The lever connecting rod has a slip or loose connection to the forked lever, so that the mill may turn about one-third way out of sail before the lever strikes the set collar on the rod. At this point the weight L comes into action and prevents the mill throwing completely out of sail, except in extreme high winds.

Strong rubber cushions, protected from the weather, prevent jar or strain to the mill as it is thrown in and out of sail.

The best of material is used in the manufacture of this mill, and is constructed as well as skilled labor can make it.

The aim is to make the U. S. the *best* and not the *cheapest* solid wheel wind mill on the market.

THE U. S. SOLID WHEEL WINDMILL.

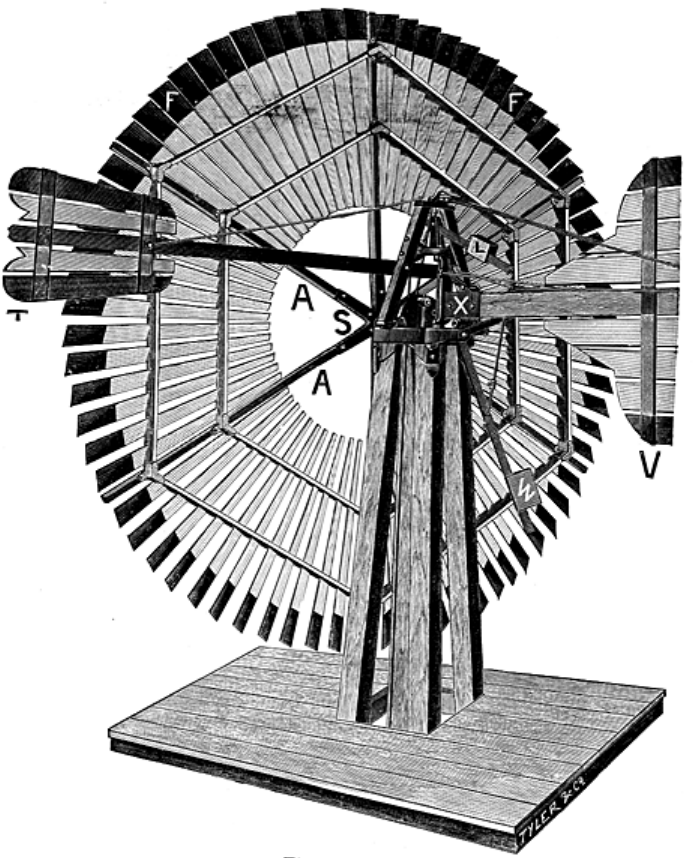


Fig. 1238.

The above cut represents a rear view of the Mill when in Sail.

For Prices, see Page 472.

REASONS WHY THE HALLADAY IS THE BEST WINDMILL.

It is a sectional wheel mill, the only true principle upon which to construct a Windmill.

It was the first self-regulating Windmill ever made.

It continues to be manufactured by the same company who have made it a specialty for over thirty-four years, and who have added to it, from time to time, many valuable improvements.

It has stood the test more than a quarter of a century in all the States of the Union, and is used in almost every country of the world, and has gained a reputation as broad as its use is extensive.

It is the Windmill generally adopted by the leading railways of this and other countries, and by our Government at its forts and garrisons.

It is the cheapest Windmill on the market, when power, workmanship, and material are considered.

It is made by skilled workmen, and only the best material is used in its construction, notwithstanding the sharp competition of late years.

It has been awarded first prizes at all world fairs where exhibited.

It is the best regulated, because it is a sectional wheel mill.

It is the safest in storms for the same reason, and as years of constant use will testify.

It is the most durable, as thousands have been in constant use for twenty years and more.

It is the most powerful, as its strength has been tested time and time again, and found superior. At a Windmill trial under the management of the Pennsylvania State Agricultural Society, the Halladay Windmill pumped fifty per cent. more water than its best competitor and almost double two of its competitors.

It is the Standard Windmill of the world. Why? Because it is made the standard of comparison by its competitors, who are constantly making and publishing statements as follows: "We will guarantee our mill equal to the Halladay." "We will guarantee our mill to give as much power as the Halladay," etc., etc. Others, not quite as modest, say: "Our mill will give more power than the Halladay," etc.

We admire frankness, but deem it advisable to be able to "prove all things and hold fast to that which is good."

U. S. WIND ENGINE & PUMP CO.

THE U. S. SOLID WHEEL WINDMILL.

We claim for the U. S. Solid Wheel Windmill that it is superior to all other Solid Wheel Mills on the market, and for the following reasons:

1st. It is not built light and cheap to meet competition, but is made heavy and strong.

2nd. It is well and thoroughly made, only skilled labor and the best of material being used in its construction.

3rd. It turns on the bed-plate by means of anti-friction rolls, which require no oiling, work very easily, and are durable.

4th. The bed and turntable are made large in diameter, admitting of the use of a large crank plate and long pitman, thus giving a long stroke to the pump without causing the side thrust and strain produced by short pitmans.

5th. The turntable being large in diameter admits of a high truss frame, which gives a thorough and substantial support to the main vane.

6th. The high truss frame also admits of the use of compound levers, so connected and provided with adjustable weights as to cause the Mill to regulate as perfectly as practicable for Mills of this class.

7th. By use of the compound levers the furling apparatus is simple, strong and durable—no chains or pulleys being required, only levers with straight rod connections.

All who have had practical experience with Solid Wheel Windmills will thoroughly appreciate the above improvements.

U. S. WIND ENGINE & PUMP CO.

THE U. S. SOLID WHEEL WINDMILL, 14 TO 22 FEET IN DIAMETER.

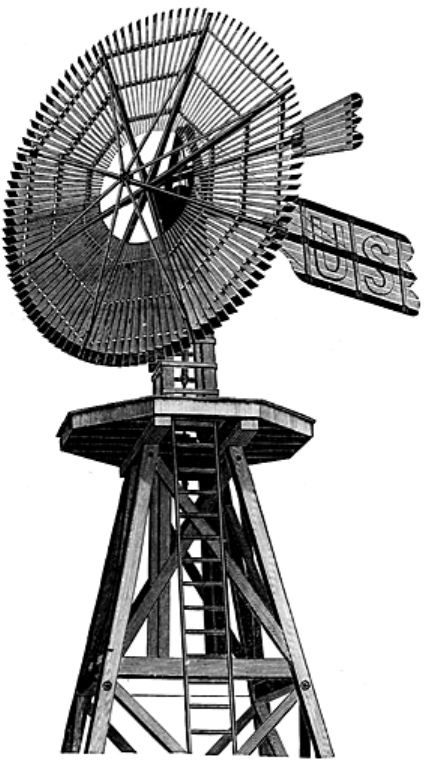


Fig. 1239.

As Used for Pumping Large Quantities of Water for Railways, Village Water Works, Drainage, Irrigation, etc.

For Prices see Page 472.

WIND POWER AND HOW IT MAY BE UTILIZED.

We give our readers below an idea of the many uses to which Wind Power can be applied, with our assurance that it will be found economical, effective and durable, provided good judgement is used in the selection of the Windmill. We have classified this matter into different headings, and treat of each class more fully in the following pages, under its respective heading, in order that those wanting Mills for particular purposes need not spend the time in reading what does not especially interest them:

WINDMILLS FOR DAIRY AND STOCK FARMS, including the pumping of water for all animals on the farm, for cooling milk, house use, and all other farm purposes.

WINDMILLS FOR DOMESTIC AND ORNAMENTAL USES, including the pumping of water for suburban residences, hotels, colleges, public and private institutions of all kinds, green houses, cemeteries, etc., etc. Also for running fountains, sprinkling lawns, washing carriages and windows, irrigating flower and vegetable gardens, etc.

WINDMILLS FOR IRRIGATION AND DRAINAGE.—Treating on Wind Power as used for raising water in large quantities, short elevations for draining low farm lands, or irrigating purposes in sections of the country affected by drought. Also the raising of water any height for draining quaries, mines, etc.

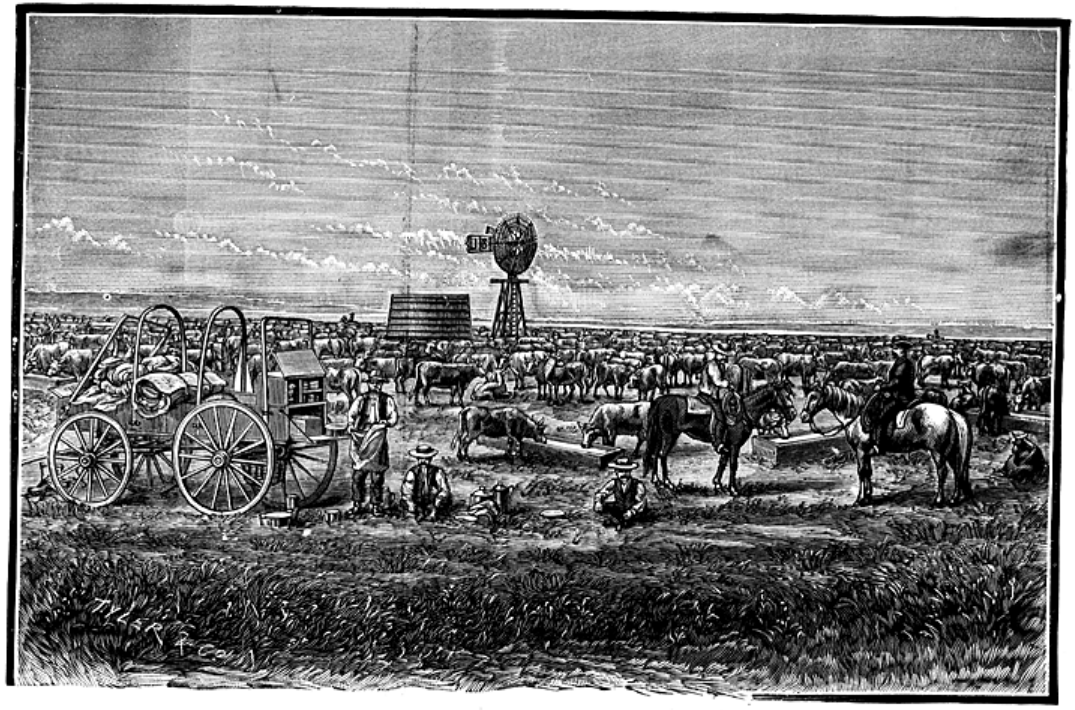
WINDMILLS AS USED FOR WATER SUPPLY AND FIRE PROTECTION FOR TOWNS AND VILLAGES.- Now that Wind Power is being practically and quite generally used for above purposes, and found reliable, durable and very economical, no town or village can afford to be without a fire protection, as they are liable at any time to be visited by a fire that will destroy more property than double the cost of a good water supply. We advise, therefore, a thorough and immediate investigation of our system.

WINDMILLS FOR RAILROAD USES, including the pumping of water into elevated tanks for supplying locomotive engines, machine shops, depot hotels, etc.

SMALL GEARED WINDMILLS FOR FARMERS, DAIRYMEN, AND STOCKMEN, used for pumping water, shelling corn, grinding feed and meal, cutting hay and stalks, sawing wood, threshing, running churns and grind-stones, etc., etc.

LARGE GEARED WINDMILLS FOR CUSTOM WORK, such as grinding feed, meal and flour for the neighborhood or general market. Also running machinery in small factories or repair shops, where the work can be so arranged as to use the Windmill when there is wind and do hand work during the calms.

THE U. S. SOLID WHEEL WIND MILL.



"A ROUND UP SCENE" IN TEXAS.

The U. S. Solid Wheel Wind Mill, as Used for Pumping Water on Cattle Ranches in Texas.

WINDMILLS FOR DAIRY AND STOCK FARMS.

The Most Economical and Durable Power for Pumping Water.

The Health of Animals Depends Upon Having Pure Water to Drink.

The waste of time and the hard work are by no means all the objections to hand pumping. Every intelligent farmer knows that neither the boys nor the hired help are always reliable, and the old gentleman himself is sometimes tired, or is absent from home in the evening; the stock are neglected until next day, when the cattle, almost famished, fill themselves so full of cold water on a winter's morning that they stand and shiver for hours, to their great injury; and if water is any considerable distance from the yard, in brooks or springs, in severe weather they will not go for it until very thirsty, when the results are the same. Every stock-raiser also knows that cattle are more or less uneasy and become unruly when not well supplied with water, and are continually breaking through enclosures, damaging crops, and straying from home in pursuit of it.

Farmers often scoop out an artificial pond, and in warm weather and fly time the cattle stand there for hours, and it soon becomes a warm, offensive mass of filth, which they are forced to drink or die, and their livers become so diseased that they are not fit food for dogs, but subjects for the cattle disease, should it visit this country; and thus grain is wasted in attempts to fatten stock with diseased livers.

Stock are often driven a considerable distance to rivers or springs for water, sometimes twice a day, but often only once, when they will drink more at a time than is good for them, especially in winter. Besides, watering from ice holes subjects the stock to more or less danger.

There are hundreds of large, well watered stock farms in the country, which the owners value fully one or two thousand dollars more than if they were not thus provided with water by the Halladay Windmill. It is high time, therefore, for the great agricultural interests of the country, that the farmers should be made aware of the fact that all the high and dry prairies, by the use of this cheap and simple device, can be made good stock farms, and really more valuable than those possessing natural advantages for water, for there is no waste land and the water can be provided directly at the points desired, in farm yards and pastures.

A tank should be provided of sufficient capacity to hold from three to four days' supply, so as to guard against occasional calms. This tank may be made just high enough for stock to drink from, or a large storage tank may be used, and small drinking tanks always kept supplied from it, and all may be protected from frost during the winter months. By the use of a force pump and house tank, located at some convenient point, a cool and fresh supply of water may always be kept on hand for domestic use, and thus save the mothers and daughters, who are too often over-worked, the laborious task of pumping water for the many uses required on farms.

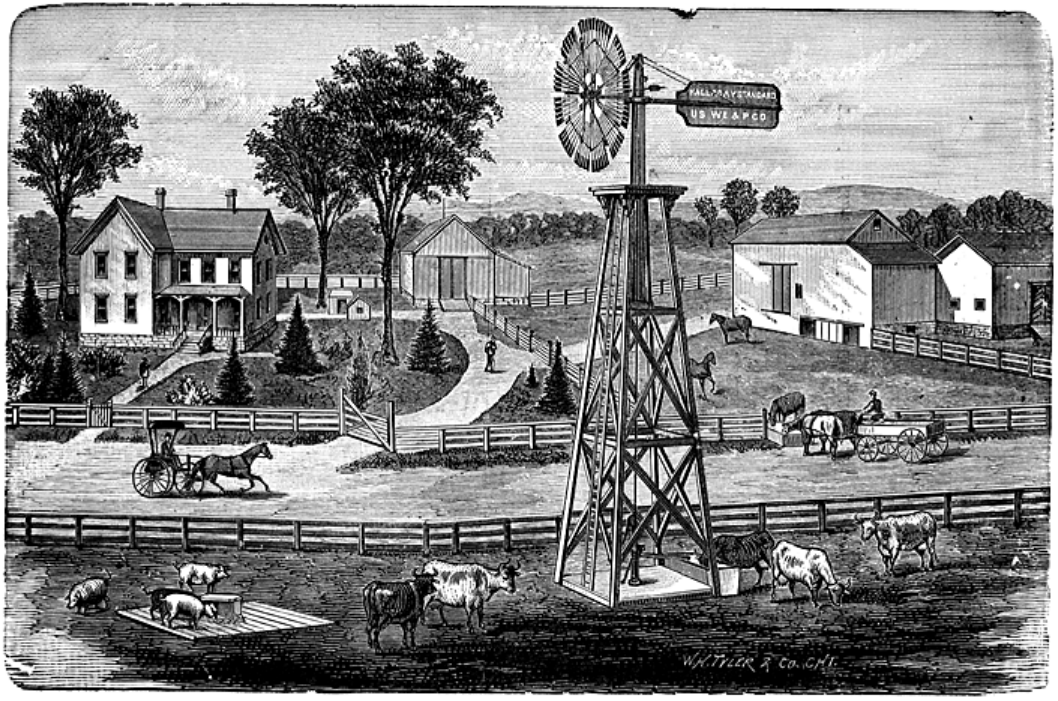
The Windmill has been the means of rapidly increasing the dairy interests of this country, by furnishing a supply of fresh, cool water making it possible for every farmer to have a "living spring" at his door and under his control.

By the use of the Windmill the exhausted wheat fields of the west may be turned into dairy farms.

Our Farm Windmills are made in six sizes, from 8 to 14 feet diameter, and where the wells are not too deep, will supply 500 head of stock.

The dictates of wisdom, the great convenience, happiness and comfort of all concerned, your highest pecuniary interest, the health of your stock, and true benevolence, should move you to adopt this most valuable invention—what the world has been waiting for for centuries.

THE HALLADAY STANDARD WIND MILL.



The Halladay Standard Wind Mill, as used for pumping Water for Stock, showing Sails spread and at work.
Made in six sizes, 8 to 14 feet diameter.

THE VANELESS STANDARD PUMPING WINDMILL.

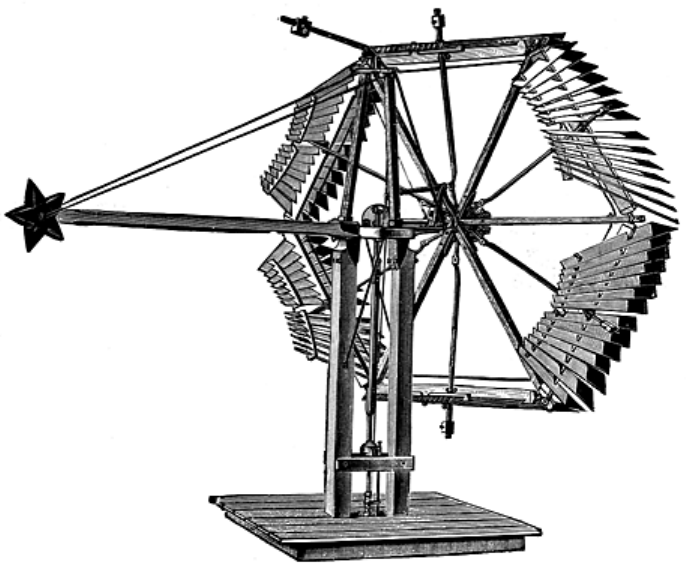


Fig. 1239a.

The above illustration represents the Mill with sails furled and at rest.

A detailed description of the Standard Vaneless Windmill will not be necessary, as it is constructed *exactly* like the Halladay Standard, except that the wind wheel is arranged to work back of the masts and the vane is done away with. The wheel is balanced by the star weight. We guarantee this Mill equal in finish and material to the Halladay, and the *best* Vaneless Mill on the market.

THE VANELESS STANDARD PUMPING WINDMILL.

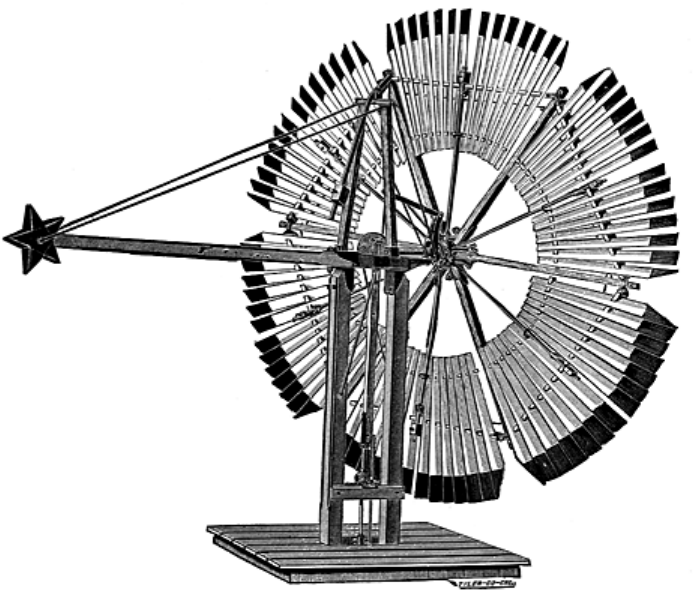


Fig. 1239b.

The above illustration represents the Mill with sails spread and ready for work.

PRICES FOR THE STANDARD VANELESS WINDMILL.

Price, No. 2, 10 feet diameter, 6 inch stroke..... 95.00
" No. 2, 10 feet diameter, 8 inch stroke..... 100.00

WINDMILLS FOR IRRIGATION AND DRAINAGE.

Wind power may be used with the best of success for raising large quantities of water short elevations for drainage and irrigation purposes. Low lands may be drained and made valuable and dry, sandy lands may be irrigated and made to yield good crops, by the use of the Halladay Windmill and our Water Elevator. This power will be found as effective, more durable, and much less expensive than steam, horse, or most any other power. Steam power is a continual expense, while the operating expense of the Windmill is, comparatively, nothing.

Wind power may also be used with the very best results for draining quarries, mines, etc.; also, for pumping water for manufacturing purposes, and the water can be pumped from almost any depth.

CAPACITY OF THE HALLADAY GEARED WINDMILL AND WATER ELEVATOR, AS USED FOR DRAINAGE AND IRRIGATION.

Power of Mill estimated in an 18-mile Wind.

Diameter of Wind Wheel.	5 Feet Elevation.			10 Feet Elevation.			15 Feet Elevation.		
	Size of Elevator Bucket in Inches.	Speed in Feet per Minute.	Capacity per Hour, in Gallons.	Size of Elevator Bucket in Inches.	Speed in Feet per Minute.	Capacity per Hour in Gallons.	Size of Elevator Bucket in Inches.	Speed in Feet per Minute.	Capacity per Hour in Gallons.
12 feet.....	3 × 4	599	18,700	3 × 4	318	11,900	2 × 3	165	8,700
13 feet.....	3 × 5	471	22,100	3 × 4	371	13,900	2 × 3	545	10,200
16 feet.....	4 × 6	445	35,300	3 × 5	451	21,100	3 × 4	413	15,400
22 feet.....	4 × 12	421	68,000	4 × 6	535	40,000	4 × 6	389	29,100
25 feet.....	4 × 12	514	81,400	4 × 8	517	51,600	4 × 6	503	37,600
30 feet.....	4 × 18	523	117,300	4 × 12	497	74,300	4 × 8	542	54,100
36 feet.....	4 × 33	433	165,700	4 × 18	477	107,000	4 × 12	321	77,900
40 feet.....	4 × 32	522	208,300	4 × 24	441	132,100	4 × 18	428	96,100
50 feet.....	2-4 × 25	502	325,400	4 × 32	517	206,400	4 × 84	502	150,200
60 feet.....	2-4 × 35	512	468,000	2, 1 × 26	456	297,200	4 × 32	542	216,360

A 30-FEET HALLADAY WINDMILL USED FOR DRAINING AN ORANGE GROVE—LETTER FROM HON. CHARLES CLINTON, STATE AUDITOR OF LOUISIANA.

U. S. Wind Engine & Pump Co., Batavia, Ill.:

Gentlemen—Your favor of 24th inst. at hand. My mill works the two 18-inch pumps admirably, with a very light wind, and without needing to be constantly repaired. I feel that I have the power for drainage suited to this country. I am more than ever satisfied that your 30 feet mill is just what will be eventually used in this State for drainage, both on sugar and tree plantations.

Very respectfully, CHARLES CLINTON.

A 12-FEET MILL PUMPING FROM A COAL MINE 160 FEET IN DEPTH, WITH PERFECT SUCCESS.

U. S. Wind Engine & Pump Co.:

Gentlemen—The Halladay Windmill put up for me in the spring of 1870 is to-day pumping water from the bottom of my coal shaft, which is 160 feet deep. It has never cost me one penny for repairs since it was put up. I expect to want another mill soon for my shaft at Mineral, and I shall surely buy the Halladay. I sunk a shaft one year ago, twelve miles south of Streator, and used a Halladay Mill on that to keep the water out while I was sinking. I think it is the best mill in use, being strong and well built of good material. AUSTIN ADAIR, Selby, Ill.

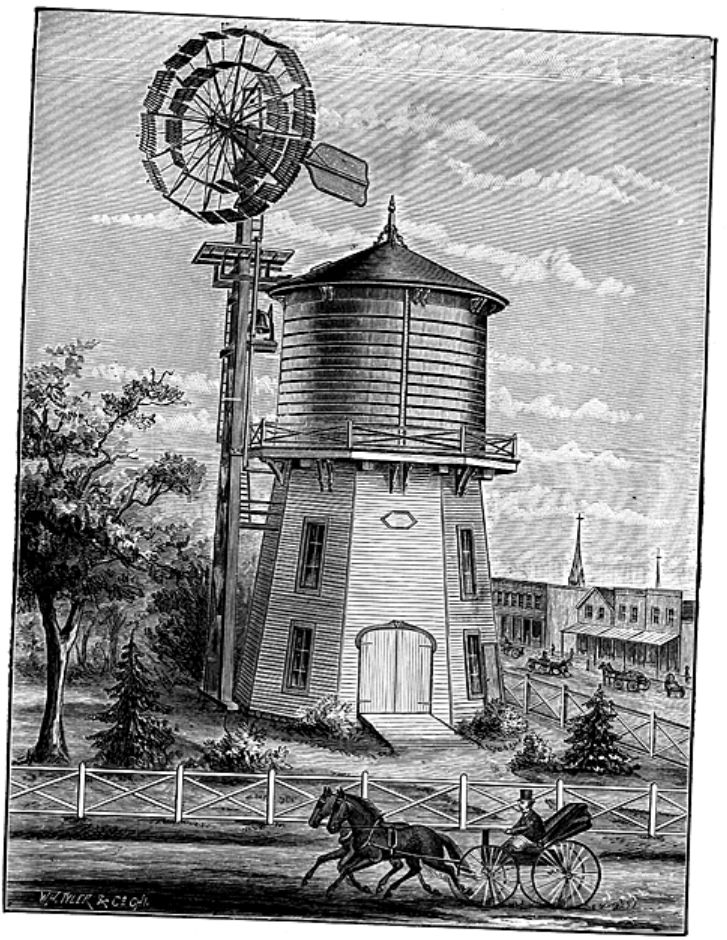
STEAM POWER TOO EXPENSIVE FOR PUMPING WATER.

U. S. Wind Engine & Pump Co.:

Gentlemen—We take great pleasure in saying we are very much pleased with the Halladay Windmill and Pump. Our business is quarrying building stone, and manufacturing grindstones, scythe stones, and sawing flagging and building stone. We use about two thousand barrels of water every twenty-four hours to supply our eleven engines and boilers in the quarry, and two boilers of 50-horse power each, at our grindstone factory, and one boiler for our eight gangs of stone saws, which run night and day. The process of sawing stone is by sand and water, and a large quantity of water is necessary. How to get this supply of water from the river, nearly a mile distant, has been a study for some time. We built a reservoir near the river at fifty-five feet elevation, and carried water in flow-pipes to our different works, using a large steam pump to fill the reservoir. This required an engineer and coal all the time. To save this expense we bought a 30-feet Halladay Windmill and a 6x24 Curtis Double-Acting Pump. We found one pump insufficient, and ordered another, same size as the first, and since this was put in we have had plenty of water and some to spare. The mill handles the two pumps without any trouble at all in light as well as strong winds. The wheel regulates beautifully in all kinds of winds, and we are pleased to speak a good word for it and for your company at any time.

Yours truly, J. McDERMOTT & CO., Berea, Ohio

THE HALLADAY WINDMILL.



25 ft. Halladay Windmill, elevating water 158 feet into an 18x24 Tank, for Fire and Domestic purposes, at Girard, Kansas.

WINDMILLS.

As used for Water Supply and Fire Protection, for Towns and Villages.

We desire to call the attention of the public to the fact that more than three-quarters of the towns and villages in the country may have a reliable and durable water supply, by the erection of a Windmill and tank, as hereafter described.

Now, that it has been demonstrated beyond a doubt that tanks can be protected from frost without the building of costly houses and the expense of fuel and attendants, our method of water supply must rapidly come into general use where the number of inhabitants will not justify the outlay necessary for the adoption of water works, as used in the cities.

Our method is to erect a large tank in the central part of town on the highest ground, and elevate it sufficiently to carry water to any part of the highest buildings, and to supply this tank with water by means of a good self-regulating, powerful and durable Windmill. The capacity of tank should be sufficient to hold from three to four days' supply, to guard against occasional calms, and the size of Windmill and pump necessary for a full supply of water will depend upon the number of families to be provided for, or the quantity of water required and the elevation to overcome.

In large towns, where one tank would be insufficient to supply the demand, others may be erected at convenient points and be supplied from the main tank at or near the well and Windmill.

We manufacture pumps, both single and double acting, especially adapted for this class of work. Our double-acting pumps are known as the "Curtis Pump," which we have made for nearly a quarter of a century, and which have been so extensively introduced on all the leading railways of the country.

Mains, of proper size, may be laid below frost through the principal streets, and fire and service hydrants located at convenient points.

A water supply, as thus described, may be made perfectly reliable and very durable. The cost is moderate, and the expense of running and keeping in order is comparatively nothing.

Hundreds of towns and villages having no fire protection lose more every year or two by fire than twice the cost of a first-class water supply. One fire often costs a town more than four water works would, where, if it had this protection, the loss might be averted.

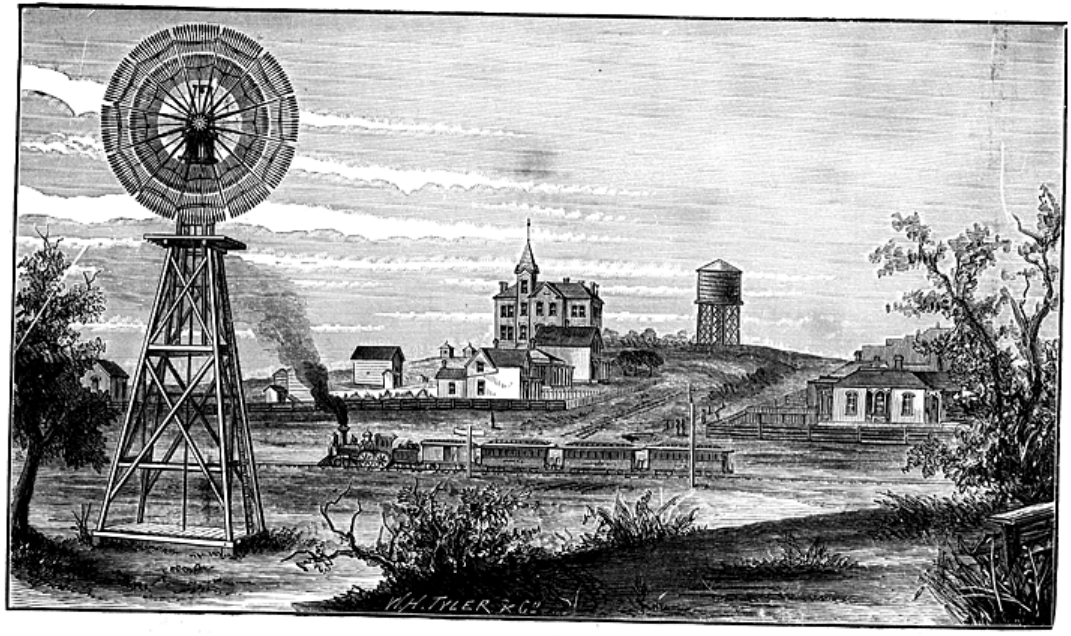
We would be pleased to furnish estimates of the cost of this method of water supply when advised as to the depth and location of well, quantity of water needed per day, height necessary to build the tower in order to give the Windmill a free current of air from every quarter, general lay of the ground, etc. And will gladly advise as to the best arrangement of tank, mill, etc.

Would call attention to testimonials published in our special water works catalogue, which will be mailed free upon application.

The illustration on following page represents a Halliday Windmill and Burnham frost proof tank as erected by us in 1882 for the town of Ida Grove, Iowa. The Windmill, 25 ft. diameter is located over the well and operates a large double acting pump, forcing water through pipes under ground to a 20x30 tank, holding 3,150 barrels and located on high ground back of the town. Cast iron mains lead from the tank through the principal streets, and fire hydrants are located at convenient corners. The pipe through which water is forced to the tank is also used for mains.

The tank is erected on timber trestle work which, together with the natural elevation of the ground, gives sufficient head to the water so as to throw 3 or 4 good fire streams on to any building in town, thus giving an excellent fire protection while the operating expenses are comparatively nothing. The business part of town is not shown, being to the right of that portion shown in the illustration.

WATER SUPPLY AND FIRE PROTECTION FOR TOWNS AND VILLAGES.



We have a Special Catalogue pertaining to Water Supply and Fire Protection which will be mailed free to all applicants.

WINDMILLS FOR RAILROAD USES.

There is scarcely a railroad man in America who has not seen the Halladay Windmill pumping at some railway water station, but there may be those who have had no practical experience with wind power, and to such we would state that for the past thirty one years, we have made a specialty of the manufacture of the Halladay Windmill, and that for a quarter of a century this mill has been in successful operation on many of the leading railroads of the country. Hundreds of our Windmills have been in active use on railways for over twenty years, at an average cost of not more than $5 per year for oil and repairs. Nearly every road in existence can use wind power, with the best success, for pumping water at some of its stations, while many roads can use this power along their entire line, and will find it perfectly reliable and durable and much cheaper than steam, horse or hand-power

A first-class windmill must be used, however one that has been thoroughly tested. As *proof* that we thoroughly believe wind power reliable and durable, we make the following proposition to railway companies.

Advise us as to the points enumerated below, and if wind power can be utilized, we will make you a bid for the erection of a Windmill, Pump, Tank and everything complete, which we will guarantee to fully supply the demand, with the understanding if they do not, we will make no charge, and will be at all expense in erecting and removing same. Should the work be accepted by the railway company, and they have doubts as to the durability of the Windmill, or do not wish to pay for all at one time, we will leave the Windmill and Pump in their possession to be paid for by monthly installments, payments to range from $30 to $50, according to size. By this method any road can have its pumping done at no greater cost per month than the actual expense of steam, horse or hand power, while the payments are being applied as settlement for the goods. Again, this method gives any road ample time to test the power and durability of our Windmills and Pumps before making settlement.

The Halladay Windmill is the favorite with railroad men, and has been adopted by many leading railways of this and foreign contries. Most of these roads have tested the merits of competing mills, both "sectional" and "solid" wheels, and now, as heretofore, give the Halladay Standard the preference above all others.

We also manufacture the celebrated Halladay outlet valves, spouts and fixtures; railway tanks of all sizes; the improved Curtis double-acting hand and power pumps; railway horse powers and pumping attachments; and deal in steam pumps, stand pipes and a full line of railway water station goods.

We would call special attention to the fact that we are not only prepared to furnish all the material for water stations, but that we contract for the erection of stations complete, using steam, wind, horse or hand-power, as may be desired.

Our supplies are in use on over one hundred of the leading railways in the United States and Canada. All interested in these supplies will please send for our railroad catalogue giving full particulars and testimonials.

We Desire The Following Points:

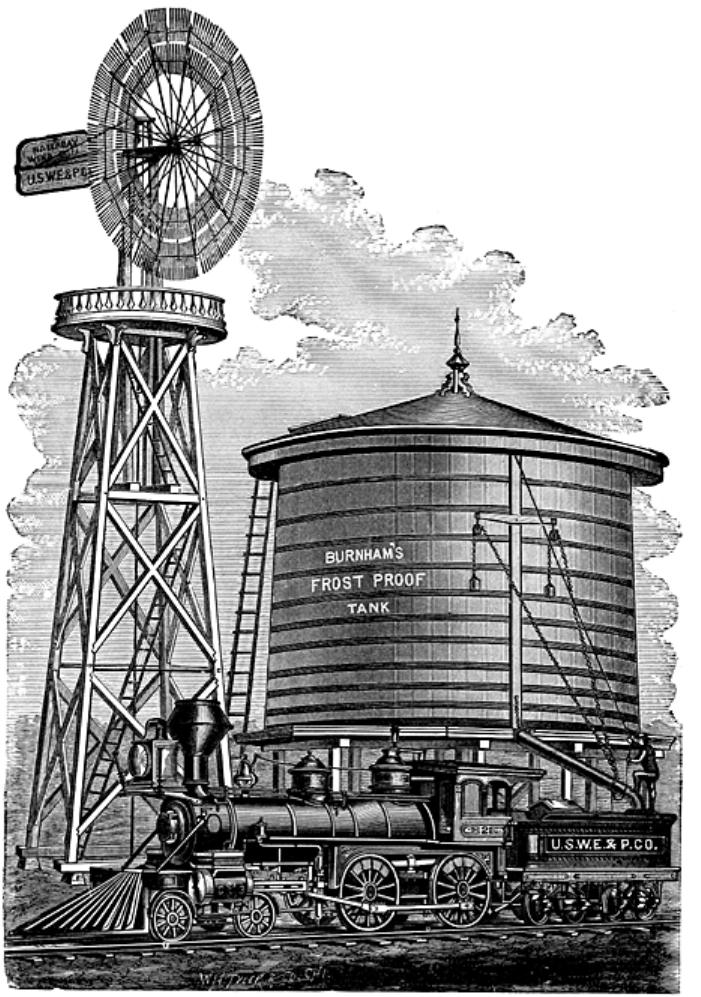
First. Depth and bore of well and least depth of water.

Second. Location of well in reference to tank, giving lateral distance and entire elevation water must be raised.

Third. Number of engines requiring water per day, and average amount taken at each watering.

Fourth. Height tower must be built to give the Windmill a free current of air.

IMPROVED HALLADAY STANDARD WINDMILL.



A Reliable Railway Water Station, consisting of the Improved Halladay Standard Windmill, Curtis Double-Acting Pump, Halladay Outlet Valve, Spout, etc., and Burnham Frost-Proof Tank.

SMALL GEARED WINDMILLS.

FOR FARMERS, DAIRYMEN AND STOCKMEN.

12 to 22 Feet Diameter.

As the utility, convenience, economy and durability of wind power becomes better known, the demand rapidly increases, and the day is not far distant when a majority of the windmills put up will be geared for driving machinery.

It is an established fact that stock of all kinds will thrive much better on ground food than they will on whole grain, and as it is always inconvenient and expensive to haul grain to and from the grist mill and pay tolls, and oftentimes impossible to go on account of bad weather, muddy roads, etc., why not adopt wind power and do work at home? You will notice by reading the testimonials contained in the following pages, that nearly every machine used in the barn, granary and dairy is being successfully operated by wind power, and as the majority of farmers, dairymen and stock raisers require about the same amount of power, and as our small size geared windmills seem to fill the whole bill in nine cases out of ten, we recommend them for use on ordinary dairy and stock farms, and invite attention to the several testimonials recently received, setting forth very minutely what the mill will do, and what the several owners' opinions are as regards its being a suitable and reliable power for farmer's use.

At one time we thought some of these statements must be exaggerated, but we now say we believe every one of them true to the letter.

With each Geared Windmill we furnish all the necessary upright shafting up to and including 40 feet and boxes for same, twelve feet of line shafting and boxes, with suitable pulleys for running sheller, grinder, elevator and countershaft, and pulleys for a pump. The shafting can be fitted up to suit the building in which it will run, and scale drawings and complete printed instructions will be sent free of charge. Or, when preferred, we can send a mechanic to erect the work, charging $3.50 per day and expenses. Our drawings and instructions are very clear, indeed, and ordinary mechanics can do all the work without difficulty.

Line shafting may run one or both sides of the upright to suit the machinery to be operated, and may lead off the upright at any height desired.

In nearly all cases the mill can be placed on the barn, thereby saving the cost of an independent tower, the pump being located in the basement or in a pit where it can be protected from frost. If the well is more than thirty feet deep and at a distance from the barn, the pump can be operated by triangles and wires or by grooved pulleys and wire cable.

A tank may be located on the second floor of the barn, which will give sufficient head to force the water through the pipes laid below frost to any points desired. Sub-tanks for stock to drink out of, fountains in the door-yard and a tank in the kitchen may be fed from the elevated tank in the barn.

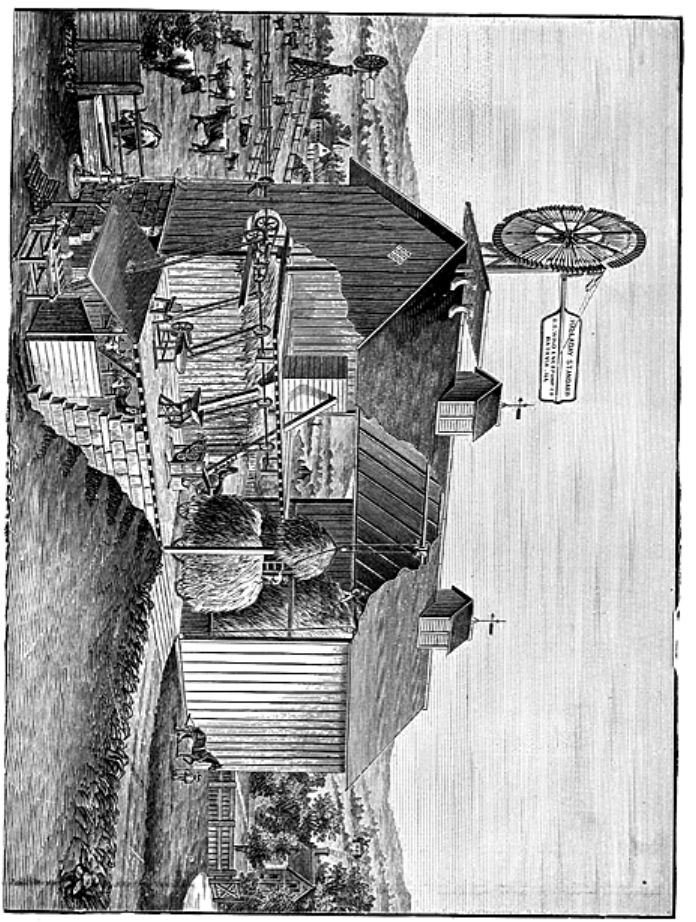
The windmill should in every instance, be high enough to catch the prevailing winds unobstructed. If you cannot place it on the building, you can put up an independent tower and run the shafting into the building, or you can build a good large room around the base of the tower and do your shelling and grinding in that.

Bins and elevators with slides can be arranged so that no attendant need be present while the work is being done.

The cost of such a mill is but little more than for one ordinarily used for pumping, and when the work it will do is taken into consideration, it is really much the cheapest. We build geared mills of different sizes, varying in power from one to forty horse, and they are being used for operating all kinds of farm, workshop and mining machinery, custom flouring grist mills, etc.

We publish a special testimonial circular, containing several hundred testimonial letters received from almost every country on the globe. This circular will be mailed free upon application.

HALLADAY STANDARD GEARED WINDMILL



Halladay Standard Geared Windmill. 10 Sizes, 12 to 30 feet diameter, 1½ to 8 horse power. For Farm and Dairy use. A cheap power for driving Corn Shellers, Feed Mills, Elevators Stalk Cutters, Threshing Machines, Circular Saws, Pumps, etc.

For Prices, See Page 472.

LARGE GEARED WINDMILLS FOR CUSTOM WORK.

Twenty-two to Sixty Feet Diameter.

It is well known that windmills were used for flouring wheat and grinding grain long before the invention of steam engines, but as a general thing, they were rudely built, and required a great deal of time and expense in adjusting them to the varying winds, in consequence of which steam was substituted, and, until quite recently, was used where water-power could not be obtained.

In hundreds of localities, running streams are not to be found, and when they are, as the country roundabout becomes settled, they grow smaller and smaller, and finally dry up altogether. Owners of water mills alone know the number of days in the year they cannot run their machinery on account of "low water" in summer and the stream "freezing up" in winter.

Where steam has been introduced, the cost of fuel, engineer and repairs to boiler and engine have so nearly eaten up the profits that millers and capitalists have become discouraged.

The beauty of having a grist mill run by wind is, that it can be located in the very heart of the wheat-growing sections, or near a railroad, where every convenience may be had for shipping, etc., whereas a water mill is almost always found in some deep ravine or out-of-the-way place, and generally in a location most unhandy for its customers.

To do custom work, only our largest sizes should be used, those having a wind wheel 50 or 60 feet diameter, and possessing from 28 to 40 horse power in a twenty mile wind. With these mills we only furnish the necessary up-right shafting, and the ball and hydraulic regulators. Parties corresponding with us in reference to these large powers for custom flouring grist mills will please state the number of runs of buhrs to be operated, and their diameter; how many for flour, how many for feed, and furnish a complete list of other machinery to be attached.

We manufacture ten sizes of geared wind mills from 12 to 60 feet in diameter, and from ½ to 40 horse power. The smaller sizes are used for operating farm, plantation and other machinery, such as feed grinders, corn shellers, elevators, straw cutters, circular saws, grindstones, churns, cotton gins, etc., etc., and the larger sizes for running custom flouring grist mills, quartz crushers, pulverizers, and other heavy machinery.

For the purpose above stated, wind power is now extensively used, and the demand is increasing every year.

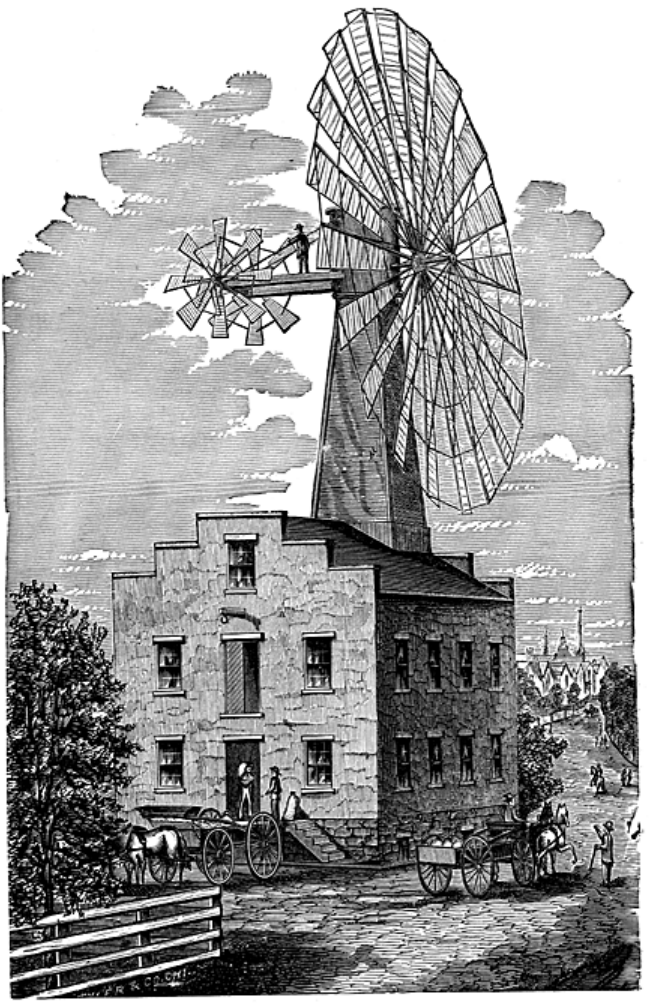
Nine tenths of the stock farmers of the country can grind their own meal and feed, saw their wood and run other machinery by this power and make it pay them well. The first cost is light, the expense of running comparatively nothing, and there is no danger from explosion or fire, as in the case of steam.

The windmill is very easily managed and very durable, and the work may be done on rainy days or at other times when outdoor work is suspended.

In many locations, a geared mill, say 22, 25 or 30 feet in diameter, may be made to pay well for grinding meal and feed for the neighborhood. For running grain and coal elevators, wind power is used with the best of success. Many parties doing a manufacturing business in a small way, where power is not required regularly every day, can use a windmill to good advantage.

With all geared mills 40 feet in diameter and less, we send a counter-shaft and pulleys for working a pump, so that they may be made to pump the water as well as grind feed, saw wood, etc.

HALLADAY & WHEELER'S PATENT CUSTOM WIND GRIST MILL.



36 to 60 feet diameter, 12 to 40 horse power.

For Prices, See Page 472.

TABLES SHOWING CAPACITIES OF THE HALLADAY STANDARD WINDMILLS.

Diameter of Cylinder.	Length of Stroke of Pump, in Inches.											
	3½	4	4½	6	6	7	8	9	10	12	15	18	24
2 inches.	.045	.052	.059	.065	.074	.093	.105	.119	.132	.159	.199	.239	.318
2¼ inches.	.057	.065	.074	.083	.103	.117	.133	.152	.169	.203	.255	.307	.408
2½ inches.	.071	.081	.092	.102	.124	.145	.166	.187	.209	.251	.314	.378	.503
2¾ inches.	.087	.099	.113	.125	.151	.177	.203	.229	.254	.306	.384	.462	.612
3 inches.	.102	.117	.133	.148	.178	.209	.239	.270	.301	.362	.454	.545	.724
3¼ inches.	.120	.134	.150	.174	.210	.246	.282	.318	.355	.427	.535	.643	.854
3½ inches.	.138	.159	.180	.201	.242	.284	.326	.367	.409	.492	.617	.742	.984
3¾ inches.	.159	.182	.207	.231	.278	.326	.374	.422	.470	.565	.709	.853	1.130
4 inches.	.180	.207	.234	.261	.315	.368	.422	.474	.531	.638	.801	.963	1.276
5 inches.	.288	.335	.368	.410	.495	.580	.665	.750	.835	1.005	1.260	1.515	2.010
6 inches.	.407	.468	.539	.593	.713	.835	.958	1.080	1.202	1.447	1.814	2.181	2.894
8 inches.	.720	.828	.936	1.044	1.256	1.472	1.688	1.820	2.124	2.552	3.204	3.856	5.104
10 inches.	1.132	1.300	1.472	1.640	1.980	2.321	2.660	3.000	3.343	4.020	5.044	6.060	8.040

The above table shows the quantity of water discharged at each stroke by a single acting pump of a given diameter and length of stroke; the figures denoting gallons or fractions thereof. For double acting pumps the quantity noted in the table should be doubled.

No.	Diam. of Wheel.	Revolutions per Min.	Different Lengths of Stroke, Inches.	Pump to Use when Elevation is—							
				10 Feet	20 to 25	30 to 40	50 to 60	75 to 80	100	125	150
1	8	54	3½ 4 4½	3½ S. A.	3 S. A.	2½ S. A.	2½ S. A.	2½ S. A.	2 S. A.	.....	.....
1½	9	52	3½ 4 4½	3½ S. A.	3½ S. A.	3 S. A.	2½ S. A.	2½ S. A.	2½ S. A.	2 S. A.	.....
2	10	50	4 5 6	3½ S. A.	3½ S. A.	3½ S. A.	3 S. A.	2½ S. A.	2½ S. A.	2½ S. A.	2 S. A.
3	12	48	5 6 7 8	4 S. A.	3½ S. A.	3½ S. A.	3½ S. A.	3 S. A.	2½ S. A.	2½ S. A.	2½ S. A.
4	13	46	5 6 7 8	5 S. A.	4 S. A.	3½ S. A.	3½ S. A.	3½ S. A.	3 S. A.	2½ S. A.	2½ S. A.
4½	14	44	5 6 7 8	5 S. A.	5 S. A.	4 S. A.	3½ S. A.	3½ S. A.	3 S. A.	3 S. A.	2½ S. A.
5	14	42	6 8 9 10	4 D. A.	4 D. A.	5 D. A.	4 D. A.	3 S. A.	3½ S. A.	3 S. A.	2½ S. A.
6	16	40	8 9 10 12	5 D. A.	5 D. A.	4 D. A.	4 D. A.	4 D. A.	3 D. A.	3½ S. A.	3½ S. A.
7	18	38	8 9 10 12	6 D. A.	6 D. A.	5 D. A.	5 D. A.	4 D. A.	4 D. A.	3 D. A.	3½ S. A.
8	20	34	8 9 10 12	2.5 D. A.	6 D. A.	6 D. A.	5 D. A.	5 D. A.	4 D. A.	4 D. A.	3 D. A.
8½	22	32	8 9 10 12	2.5 D. A.	2.5 D. A.	6 D. A.	6 D. A.	5 D. A.	5 D. A.	4 D. A.	4 D. A.
9	25	30	12 15 18	2.5 D. A.	2.5 D. A.	2.5 D. A.	2.5 D. A.	6 D. A.	5 D. A.	4 D. A.	4 D. A.
9½	28	28	12 15 18	2.10 D. A.	2.5 D. A.	2.5 D. A.	2.5 D. A.	2.5 D. A.	6 D. A.	5 D. A.	4 D. A.
10	30	26	12 15 18	2.10 D. A.	2.10 D. A.	2.5 D. A.	2.5 D. A.	2.5 D. A.	2.5 D. A.	6 D. A.	5 D. A.

"S. A." Single Acting. "D. A." Double Acting.

The above table shows the diameter of wind wheel, revolutions per minute, and different lengths of stroke, together with the size pump that is recommended to use with each for various depths of wells. The three largest size Windmills can be arranged to give 24 inch stroke when required.

It will be noticed in the above table that in some instances the same pump is recommended for different size mills where the elevation is the same. This is because there are so few different sizes of Pumps compared with the number of mills and the several elevations of water named. In such cases, therefore, the smaller mill would be put on a shorter stroke than the larger. For instance, take the 32 feet mill, well 125 feet deep, the pump recommended is 4 inch double acting; and the same for a 25 foot mill. In such a case we should give the 32 feet mill a 12 inch stroke and the 25 foot mill a 18 inch stroke. The length of stroke, however, would, in a measure, depend upon the location for wind. In certain localities where the winds are strong, the mills might be given their longest stroke when attached to the pumps named. All the different sizes of pumps enumerated are of our own manufacture and especially adapted to windmill use. Where water is to be drawn by suction or forced long distances, due allowance should be made for friction on the inside of the pipe. Generally speaking, the bore of the pipe should be one-half that of the pump, but in case of a double acting pump, and long lateral distance, it is advisable to have the bore of the pipe one size larger than one-half the bore of the pump; as for instance, 6 inch double acting pump, 4 inch pipe, etc. Where long suction pipes are necessary, or where the water has to be lifted or forced to a great elevation or lateral distance, air-chambers are indispensible, but as it is always advisable to locate the pump as near the source of supply as possible, they are not as often required on the suction pipe as on the discharge.

PRICES HALLADAY WINDMILLS.

FARM SIZES HALLADAY PUMPING WINDMILLS.

For Dairy and Stock Farms, Water Supply, and Fire Protection for Suburban Residences, etc.

No.	Diameter.	Revolutions.	Length of Stroke, in Inches.	Weight, in Pounds.	Price.
1	8 feet.	54 per minute.	3½, 4 and 4½	440	90.00
1½	9 feet.	52 per minute.	3½, 4 and 4½	440	95.00
2	10 feet.	50 per minute.	4, 5 and 6	500	100.00
3	12 feet.	48 per minute.	6, 7 and 8	700	130.00
4	13 feet.	46 per minute.	6, 7 and 8	870	140.00
4½	14 feet.	44 per minute.	6, 7 and 8	975	160.00

LONG STROKE WINDMILLS.

Especially Adapted to Tubular Wells.

No.	Diameter.	Revolutions.	Length of Stroke, in Inches.	Weight, in Pounds.	Price.
2	10 feet.	50 per minute.	6, 7 and 8	475	105.00
3	12 feet.	48 per minute.	6, 8 and 10	750	135.00
4	13 feet.	46 per minute.	6, 8, 10 and 13	990	150.00
4½	14 feet.	44 per minute.	6, 8, 10 and 12	1,000	175.00

INSTRUCTIONS.

Parties desiring to purchase Pumping Mills are requested to state:

I. The depth of well or spring below the surface of the ground.

II. The least depth of water in it.

III. The height above the platform of the well to where you wish the water discharged.

IV. The lateral or side distance (if any) from the supply to the place where the water is to discharge.

V. The amount or quantity of water wanted, or at least the purpose for which it is to be used; also, the extent or quantity of water afforded by the supply or source.

VI. The height at which the Mill must be erected to secure a free current of air, in order that a sufficient amount of connecting rod may be sent.

VII. In case of a bored well, give the diameter.

VIII. Whether tower has 1, 2 or 4 masts. Unless otherwise instructed, we send bed plates arranged for 2-mast towers.

IX. If a Long Stroke Mill is wanted, do not fail to mention "Long Stroke."

RAILROAD SIZES HALLADAY PUMPING WINDMILLS.

For Railroads, Drainage, Irrigation, etc.

No.	Diameter.	Revolutions.	Length of Stroke, in Inches.	Weight, in Pounds.	Price.
5	14 feet.	42 per minute.	6, 8, 9 and 10	1,410	200.00
6	16 feet.	40 per minute.	8, 9, 10 and 12	1,885	280.00
7	18 feet.	37 per minute.	8, 9, 10 and 12	2,025	325.00
8	20 feet.	34 per minute.	8, 9, 10 and 12	2,500	375.00
8½	22 feet.	32 per minute.	8, 9, 10 and 12	2,820	425.00
9	25 feet.	30 per minute.	12, 15 and 18	3,500	500.00
9½	28 feet.	28 per minute.	12, 15 and 18	3,720	550.00
10	30 feet.	26 per minute.	12, 15 and 18	3,866	575.00

When ordering these Windmills state height of tower, so that a suitable amount of blue wood rod connection and shut-off wire may be sent with each Mill.

The bed-plates to the Nos. 5 and 6 Mills are made for 2-mast towers, other sizes for 4-mast towers.

N. B.—Prices given above do not include any part of the tower, pump or pipe.

GEARED WINDMILLS.

For Driving Machinery and Pumping Water.

With all geared mills under 50 feet diameter, we furnish the necessary upright shafting, up to and including 40 feet, 8 to 12 feet horizontal shafting, pulleys for running sheller, grinder, elevator and countershaft and pulleys for pump.

With 50 and 60 feet mills we furnish nothing except the upright shafting, boxes for same, and regulating apparatus.

No.	Diameter.	Horse Power, Wind 18 Miles per Hour.	Speed of Horizontal Shaft per Minute.	Weight, Pounds.	Price.
3	12 feet.	1½	270	1,300	160.00
4	13 feet.	1¾	260	1,420	170.00
4½	14 feet.	2½	250	1,500	225.00
6	16 feet.	3½	280	2,200	375.00
8½	22 feet.	5	230	3,000	550.00
9	25 feet.	6	240	4,700	700.00
10	30 feet.	8	210	5,200	800.00
11	36 feet.	12	160	7,000	1,000.00
12	40 feet.	18	150	9,500	1,200.00
13	50 feet.	28	160	28,000	2,500.00
14	60 feet.	40	150	32,000	3,000.00

INSTRUCTIONS.

When desiring to purchase geared mills, state:

I. The number and kind of machines to be run, and power required.

II. Whether you wish tower framed into the roof of building, or built independently. If framed in building, give height of same, distance between floors and size of timbers. A rough pencil sketch of building, grounds, etc., giving actual distances, is very convenient for us to refer to in making drawings, and often saves delay.

III. The height at which the mill must be erected to secure a free current of air.

IV. The distance above ground line or floor the horizontal shaft should lead off the perpendicular—and length of horizontal shaft required.

It is important, and should be observed, that a windmill, deriving its force and power from the wind, should have as great an elevation as possible within reasonable limits, so as to obtain steady motion and the full benefit of light winds.

Those wishing Geared Windmills for driving machinery should select a size having sufficient power to do the required work in ordinary winds, or a majority of the whole days in the year.

N. B.—Prices given do not include any part of the tower, pump or pipe.

U. S. SOLID WHEEL PUMPING WINDMILLS.

For Dairy and Stock Farms, Railways, Drainage, Irrigation, etc.

No.	Diameter.	Revolutions.	Length of Stroke, in Inches.	Weight, in Pounds.	Price.
2	10 feet.	52 per minute.	4, 5 and 6	550	90.00
3	12 feet.	48 per minute.	6, 7 and 8	700	120.00
5	14 feet.	43 per minute.	6, 8 and 10	1,200	160.00
6	16 feet.	40 per minute.	6, 8, 10 and 12	1,700	250.00
7	18 feet.	37 per minute.	6, 8, 10 and 12	1,800	280.00
8	20 feet.	37 per minute.	6, 8, 10 and 12	3,000	350.00
8½	22 feet.	35 per minute.	6, 8, 10 and 12	3,300	400.00

LONG STROKE WINDMILLS.

Specially Adapted to Tubular Wells.

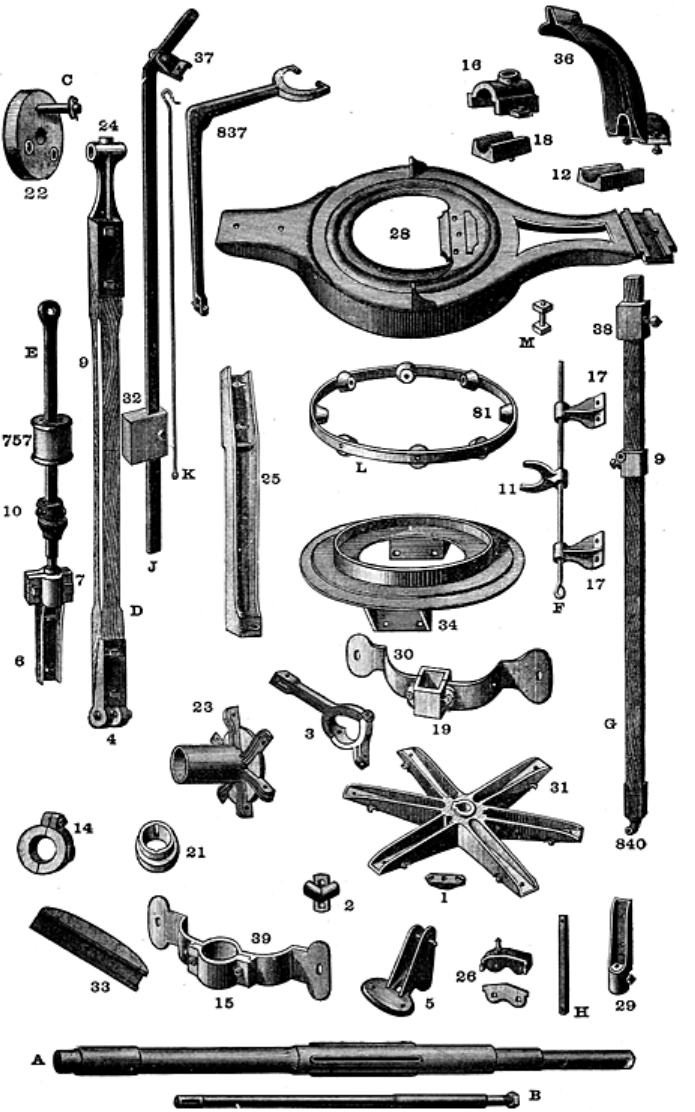
No.	Diameter.	Revolutions.	Length of Stroke, in Inches.	Weight, in Pounds.	Price.
2	10 feet.	50 per minute.	6, 7 and 8	560	95.00
3	12 feet.	48 per minute.	6, 8 and 10	725	125.00
5	14 feet.	43 per minute.	6, 8, 10 and 12	1,250	170.00

See Instructions for ordering pumping windmills, page 471.

N. B.—Prices given do not include any part of the tower, pump or pipe.

CUTS OF REPAIRS FOR 10 FT. HALLADAY MILL.

Giving Numbers of the Castings.



See next Page for Names of Castings.

PLEASE READ CAREFULLY BEFORE ORDERING REPAIRS.

From the outset it has been our policy to make changes in style and pattern when such change promised real improvement. Many changes have thus been made from time to time, making it necessary that our customers ordering repairs use all diligence in giving correct data, thereby insuring the shipment of proper parts.

Where it is possible give us, in addition to the name of the repair desired and the size of the machine to which it belongs, the number on the casting. When it is impossible to give the number of casting or part desired, please furnish us with all possible information in your power, naming date of purchase and factory number of machine if it can be found; if a bored casting, give size of bore; if you cannot do any better, lay the part on paper and carefully mark around it, and send paper to us, as many times this will give us a clue when without it we would not understand the order.

We sell some articles not of our own manufacture, but can always furnish repairs for them on short notice if furnished with proper information, therefore inform us of any marks you may find on any machine, pump, etc., for which you require repairs, giving the name of the manufacturer, number of casting, etc.

Never give us credit for being able to guess at what is wanted. Be explicit, and generally we can make prompt shipment.

NOTICE.

Before ordering repairs, please read over the following instructions and comply strictly with same. Your orders will then have prompt attention.

Instructions for Ordering Repairs for Halladay Wind Mill.

1st. Give diameter of Wind Wheel.

2d. Give the progressive number of the Windmill. In case of a 10 ft. Windmill this number will be found on the top of turntable casting, No. 25. For other sizes the progressive number will be found on the front end of each turntable.

3d. State when Wind Mill was first erected, or in case it was ordered direct from factory, state date of order.

4th. In case of ordering castings, examine the old part carefully and find the number of same, and give this number in your order together with a description of the part.

Since having the illustrations made on the opposite page, some parts of the Mill have been changed, and while the parts may be similar, they would not, in all cases, fit in the place of those shown in the illustrations, and in these cases the numbers will not correspond with the numbers in the illustrations. Be very careful, therefore, to give the number found on the old casting which you wish replaced.

N. B. In case you fail to find a number on the casting of which you wish duplicate part, also fail to find illustration of same on opposite page, take the casting and lay it on a sheet of paper and mark carefully around it and send this diagram to us, giving other particulars asked for above.

1. Cap to Elbow Pin.
2. Angle Box.
3. Elbow.
4. Lower Pitman Box.
5. Tilt Bar Lever.
6. Swivel Box.
7. Swivel Box Cap.
8. Set Iron on Regulating Rod.
10. Sliding Boss on Stub End.
11. Slide Fork.
12. Front Box on Turntable.
14. Shoes on Slide Head Collar.
15. Sleeve Box Cap.
16. Rear Cap on Turntable.
17. Slide Fork Stand.
18. Rear Box on Turntable.
19. Connecting Rod Guide Cap.
21. Slide Head Collar.
22. Crank Plate.
23. Front Plate.
24. Top Pitman Box.
25. Flat Bar Connection.
26. Tilt Bar Socket.
28. Turntable.
29. Force Pump Connection.
30. Connecting Rod Guide.
31. Spider.
32. Top Lever Weight.
33. Counter Balance Weight.
34. Bed Plate.
36. Front Cap on Turntable.
37. Top Lever Fulcrum.
38. Regulating Weight.
39. Sleeve Box.
81. Anti-Friction Rolls.
757. Sleeve on Stub End.
837. Forked Lever.
840. Regulating Rod Strap.
A. Main Shaft.
B. Slide Head Centre Rod.
C. Crank Pin.
D. Pitman.
E. Stub End.
F. Slide Fork Rod.
G. Regulating Rod.
H. Link connecting Front Plate to Elbow.
J. Top Lever.
K. Lever Connecting Rod.
L. Carriage Ring.
M. Clamp Bolt.

FARM PUMPING WINDMILL REPAIR PRICE LIST.

Description of Parts.	Nos. 1 and 1½ Mills. No. of Castg	Price	No. 2 Mill. No. of Castg	Price	No. 3 Mill. No. of Castg	Price	No. 4 Mill. No. of Castg	Price
Arm	.....	1.00	.....	1.00	.....	1.20	.....	1.40
Angle Box	2	.20	2	.20	78	24	78	.20
Angle Box, N. S., 1884	.....	.....	.....	.....	873	.20	.....	.....
Blue Wood Rod	.....	.60	.....	.60	.....	.73	.....	.73
Buck Plate and Shoes	41 / 54 \	2.60	314 / 51 \	2.00	186 / 68 \	3.50	314 / 113 \	3.50
Buck Plate, Long Stroke	.....	.....	542	3.00	.....	.....	.....	.....
Bed Plate	738	5 00	74	5.00	82	7.00	731	7.25
Bed Plate, N. S., 1884	.....	.....	.....	.....	814	7.00	.....	.....
Bed Plate, Long Stroke	.....	.....	702	5.00	.....	.....	.....	.....
Band Rod	.....	.25	.....	.25	.....	.25	.....	.25
Box of Iron Work	.....	25.00	.....	25.00	.....	30.00	.....	26.50
Crank Pin	.....	1.00	.....	1.00	.....	1.30	.....	1.30
Crank Plate, O. S.	48	1.25	53	1.25	689	2.50	689	2.50
Crank Plate, Long Stroke	.....	.....	200	1.50	700	3.00	700	3.00
Crank Plate, N. S.	.....	.....	92	1.25	16 30	2 50	16 33	2 50
Counter Balance Weight	53	.60	53	.60	.....	.75	.....	.75
Connecting Rod Guide	697	.60	698	.60	699	1.00	699	1.00
Clamp	47	.30	103 / 104 \	.30	65	.40	107	.40
Chain Pulley	.....	.70	691 / 692 \	.70	691 / 692 \	.70	691 / 692 \	.70
Elbow, O. S.	45	.35	.....	.35	64	.40	64	.40
Elbow, N. S.	.....	.....	71	.35	878	.40	64	.40
Elbow, Long Stroke	.....	.....	112	.35	.....	.....	.....	.....
Elbow Collar	62	.10	12	.75	114	1.25	115	1.25
Elbow Collar, N. S., 1884	.....	.....	.....	.....	885	1.25	.....	.....
Front Box	44	.50	12	.50	61	.60	105	.60
Front Cap, O. S.	.....	.75	73	.75	76	1 20	589	1.20
Front Cap, N. S.	.....	.....	56	1.25	875	1.50	.....	.....
Front Plate	601	.50	23	.50	126	.65	113	.65
Forked Lever	.....	1.50	857	1.50	869	3.00	869	3.00
Forked Lever Weight	99	1.10	98	1.10	766	2.25	766	2.25
Fork Sleeve	10	.35	13	.35	69	.45	68	.40
Tung Bolt	.....	21 0	.....	21.00	.....	34.00	.....	35 00
Pan, Oak	.....	3.00	.....	3 50	.....	4 25	.....	4.25
Force Pump Connection	99	.70	20	.50	101	.60	101	.60
Guide Box, 2 Post	.....	.40	90	.40	808	.60	808	.80
Guide Cap, Bottom	.....	.40	19	.60	74	.80	74	.80
Joint for Connection Rod	143	.80	143	.60	.....	1.00	.....	1.00
Knuckle	.....	.7	.....	.70	55	.65	65	.80
Lever Set Screws	.....	.10	.....	.10	.....	.12	.....	.12
Lever Connection Rod	.....	.85	.....	.85	.....	.40	.....	.40
Link	.....	.10	.....	.10	.....	.12	.....	.12
Tower Pitman Box	4	.70	4	.70	80	.80	80	.80
Mill Connection	26	.80	26	.80	120	1 00	223	1.00
Mill Connection, Long Stroke	.....	.....	637	1 00	130	1.3	130	1.30
Pitman, Complete	.....	2 20	.....	2 20	.....	2 60	.....	2 60
Pitman, Wood	.....	.80	.....	.80	.....	1.00	.....	1 00
Post Brace, Set	.....	.75	.....	.75	.....	1.1	.....	1.10
Regulating Weight	.....	.25	36	.25	96	.25	38	.25
Regulating Rod	.....	.50	.....	.50	.....	.6	.....	.60
Regulating Rod, Wood	.....	.25	.....	.25	.....	.30	.....	.30
Regulating Rod Strap	.....	.20	840	.20	850	.25	850	.25
Rod Inside of Main Shaft	.....	.....	.....	1.00	.....	.....	.....	.....

Description of Parts.	Nos. 1 and 1½ Mills. No. of Castg	Price	No. 2 Mill. No. of Castg	Price	No. 3 Mill. No. of Castg	Price	No. 4 Mill. No. of Castg	Price
Rear Box on Turntable	.....	.50	18	.50	82	.60	106	.60
Rear Cap on Turntable	.....	.70	16	.70	75	.80	868	.80
Rear Cap on Turntable, L. S	.....	.....	43	.70	.....	.....	.....	.....
Sleeve	.....	.60	805 / 757 \	.60	788	.70	788	.70
Sleeve Box	596	.90	800 / 807 \	.90	816 / 817 \	1.00	70 / 71 \	1.00
Sleeve Box, 4 Post	.....	.....	40	.90	.....	.....	.....	.....
Sleeve Box, O. S	.....	.....	.....	.....	70 / 71 \	1.00	.....	.....
Swivel Box	6 / 7 \	.60	6 / 7 \	.60	67 / 68 \	.70	57 / 58 \	.70
Stub Rod, Complete	.....	5.50	.....	5.70	.....	6 00	.....	6.00
Spider Casting	730	3.00	31	3 00	117	3 00	731	6.00
Spider Casting, N. S., 1884	.....	.....	.....	.....	893	6 00	.....	.....
Spider Casting, L. S	.....	.....	435	3.00	.....	.....	.....	.....
Spider and Shaft, Complete	.....	16 00	.....	16.00	.....	26.00	.....	26 00
Shaft	.....	4.00	.....	4.00	.....	4.75	.....	4 75
Stud Head Collar and Shoes	.....	.....	21	1.50	.....	.....	.....	.....
Shoes	.....	.35	14	.35	60	.45	112	.45
Slide Fork, Complete	11	.90	11	.90	89	.90	90	.90
Slide Fork Stand	46	.20	17	.20	67	.25	67	.25
Slide Fork Stand, L. S.	.....	.....	421	.20	.....	.....	.....	.....
Slide Head Rods	.....	.56	.....	.35	.....	.60	.....	.60
Sheave Case	.....	.....	631	.40	631	.45	631	.45
Sheave	.....	.....	632	.30	632	.30	632	.30
Set Iron in Reg. Rod	87	.20	8	.30	72	.25	72	.25
Sliding Rose	.....	.25	10	.25	89	.30	89	.30
Spiked Iron	.....	.35	35	.25	90	.40	90	.40
Shut-off Rod	.....	.85	.....	.35	.....	.50	.....	.50
Slat, Wood	.....	.10	.....	.10	.....	.12	.....	.12
Truck Roll	63	.25	84	.25	77	.30	116	.30
Truck Rod, Long Stroke	.....	.....	93	.25	.....	.....	.....	.....
Turntable	60	9.00	28	9.00	58	12.00	949	12.50
Turntable, Long Stroke	.....	.....	705	10 00	.....	.....	.....	.....
Top Lever	.....	.45	.....	.45	.....	.50	.....	.50
Top Lever Weight	.....	.75	92	.75	.....	.90	.....	.90
Truss Frame	.....	1.50	.....	1.60	.....	2.40	.....	2 40
Truss Rods	.....	1.50	.....	1.50	.....	1.75	.....	1 75
Tilt Bar, Wood	.....	.50	.....	.50	.....	.5	.....	.50
Tilt Bar, Sockets	96	.10	20	.10	69	.10	63	.10
Tilt Bar Lever, N. S	.....	.....	.....	.....	874 / 58 \	.40	56	.40
Tilt Bar Lever, O. S	.....	.85	92	.85	91	.40	.....	.40
Tilt Bar Lever, Medium	.....	.50	95	.85	.....	.40	.....	.....
Truss Cap Iron	.....	.40	94 / 37 \	.40	.....	.40	.....	.40
Top Pitman Box, L. S	.....	.....	120	.60	.....	.....	.....	.....
Top Pitman Box, O. S	131	.50	121	.50	140	.90	140	.90
Top Pitman Box, N. S	.....	.....	24	.60	123	.90	123	.90
Top Guide Box, 2 Post	19 / 20 \	.60	704	.60	73	.70	639 / 73 \	.70
Top Guide Box, 4 Post	.....	.....	54	.60	.....	.....	.....	.....
Vane	.....	8.00	.....	8 00	.....	11.00	.....	11 00
Vane Bone	.....	1.50	.....	1.50	.....	1.70	.....	1.90
Wood Pump Connection	.....	.80	.....	.80	.....	1.00	.....	1.00

PRICE LIST OF REPAIRS FOR NOS. 4 AND 4½ GEARED WINDMILLS.

	No. 4.	No. 4½.
Arm	$1 20	$1 40
Angle Box	.20	.20
Back Plate and Shoes	3.00	3.00
Back Plate and Shoes, sec'l.	3.50	3.50
Bed Plate	7.25	7.25
Band Rod	.25	.25
Brace Rods	.75	.75
Band Strap	.10	.10
Crank Plate (No. 2)	1.25	1.25
Crank Pin (No. 2)	1.00	1.00
Cross Head, Lower	2.25	2.25
Cross Head, Upper	1.50	1.50
Cross Head Lever and Link	1.50	1.50
Cross Head Shoes	.60	.60
Elbow	.40	.40
Elbow Collar	1.25	1.25
Front Box	.80	.80
Front Cap	1.20	1.20
Front Plate	.85	.85
Forked Lever	3.00	3.00
Fan, One	4.35	4.65
Fans, Set	35.00	36.50
Link	.12	.12
Lever Weight	2.10	2.00
Lower Gear	3.50	3.50
Lower Pinion	1.60	1.50
Main Gear	3.50	3.50
Main Pinion	1.60	1.60
Mill Connection	.50	.50
Post Brass, Set	1.10	1.10
Pump Pitman	2.10	2.20
Regulating Weight	.20	.20
Regulating Rod	.60	.60
Regulating Rod Strap	.25	.25
Rear Box	.60	.60
Rear Cap	.80	.80
Spider, only	6.00	6.00
Spider, complete	26.00	25.00
Shaft, Main	5.50	5.50
Slide Head Rods	.60	.60
Slat, Painted	.12	.12
Shoes	.45	.45
Set Iron on Reg. Rod	.35	.35
Step Box	3.25	3.25
Turntable	14.00	14.00
Truck Roll	.30	.30
Truss Frame	2.00	3.00
Truss Rods, Set	1.75	1.75
Tilt Bar	.30	.30
Tilt Bar Lever	.40	.40
Tilt Bar Socket	.10	.10
Upper Cross Head Connect'n	.50	.50
Vane	10.00	12.00
Weight Lever	1.25	1.25

Fixtures.	Nos. 4 and 4½.
Babbitt Center Box	$1 60
Counter Shaft only	1.50
Pulley, 18 inch diameter, 4 inch face	4.45
Pulley, 20 inch diameter, 4 inch face	5.25
Pulley, 24 inch diameter, 4 inch face	6.00
Pulley, 30 inch diameter, 6 inch face	11.50
Pulley, 24 inch diameter, 3 inch face	5.50
Pulley, 6 inch diameter, 4 inch face	2.35
Pulley, 8 inch diameter, 4 inch face	3.75
Pulley, 4 inch diameter, 2½ inch face	2.00
Mitre Gears, 19 inch diameter, per pair	5.00
Hangers, 18 inch, plain	1 40
Pillow Box	1.50
Shafting, Upright, per foot	.40
Shafting, Horizontal, per ft.	.50
Sprocket Wheel, 24 inch	6.00
Sprocket Wheel, 4 inch	1.50
Sprocket Wheel Chain, per ft.	.38
Set Screw Coupling, short	1.75
Set Screw Coupling, long	2.50
Set Collar	.50

REPAIRS FOR LARGE WINDMILLS.—PUMPING AND GEARED.

Description of Parts.	No. 5 Mill.		No. 6 Mill.		No. 7 Mill.		No. 8 Mill.		No. 8½ Mill.		No. 9 Mill.		No. 9½ Mill.		No. 10 Mill.	
	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price
Arm		1.50		1 88		1.30		1.40		1.30		1.50		1.60		1.70
Arm (woodwork only)		.90		.90		.90		1.00		1.00		1.10		1.20		1.30
Angle Box	97	.80	97	.80	93	.80	96	.80	96	.80		.80		.90	92	.90
Blind Rod Connection		.70		.70		.70		.80		.80		.90		.90		.90
Back Plate and Shoes	601	4.00	594	4.00	207	4.00	591	4.50	591	4.50	342	5.50	342	5.50	342	5.50
do sectional	593	4.50	593	4.50	207	4.50	591	5.00	591	5.00	899 / 342	6.00	899 / 342	6.00	899 / 342	6.00
Bed Plate	278	16.00	980 / 701	12 00	705	12.00	277	15.00	976 / 277 / 262	25.00	284 / 344	20.00	284 / 344	20.00	284 / 344	21.00
Ball Weight	838	1.00	624	1.00	624	1.00										
Band Rod, long		.30		.30		.30		.30		.30		.30		.40		.45
Band Rod, short		.25		.25		.25		.25		.25		.30		.35		.35
Band Strap		.10		.10		.10		.10		.10		.10		.10		.10
Brace		.60		.60		.60		.65		.65		.70		.75		.75
Clamp	891	.40	461	.40	481	.40	461	.40	434 / 461	.50	939 / 463	.75	939 / 462	.75	939 / 462	.75
Crank Pin		1 25		1.25		1.25		1 50		1.50		1.75		2.00		2 25
Crank Plate	280	2.50	281	2 50	281	2.50	281	2.50	281	2 50	734	4.00	734	4.00	737	4.00
Cast Cross Head			511	2.35					511	2 35	496	2.75	936	2.75	936	2 75
Elbow	64	.40	64	.40	183	.40	188	.40	208 / 133	.40	111	.50	708	.50	111	.60
Elbow Collar		1.50		1 50	169	1.75	164	1 80	164	1.80						
Elbow Bolts (3)		.15		.15		.15		.15		.15		.18		.18		.18
Front Box	185	.60	185 / 178	.60	171	.60	176	1.00	176	1.00	902 / 189	1.25	902 / 188	1.25	902 / 183	1.25
Front Cap and Ears	166	1.00	146 / 150	1 00	172	1.00	171	1.20	283 / 177	1.20	183 / 190	1.50	903 / 184	1.50	903 / 184	1.50
Front Plate	123	.75	123	.75	127	.75	162	.80	203	1.00	709 / 209	1.00	709	1.00	203	1.00
Forked Lever		2.00		2.50		2.50		2.75		2.75		3.00		3.00		3.00
Forked Lever Weight	769	2.25	651	2.50	651	2.50	651	2.50	651	2.50	454	3.00	464	3.00	454	3.00
Fans in set		55.00		57.00		60.00		73.00		76.00		85.00		87.00		90.00
Fan (outside section)		4.00		4 00		4 15		4.20		4.25		4.50		4.75		4.75
Fan (inside section)		3.00		3.00		3.25		3.43		3.50		3.75		4.00		4.00
Knuckle	209	.75	210	1.00	210	1.00	211	1.25	211	1.25	211	1.35	211	1.35	211	1.25
Fork Sleeve	479	.40	627	.50	627	.50	478	.60	478	.60	478	.60	478	.60	478	.60
Link		.30		.75		.95		.40		.40		.40		.40		.40
Lower Pitman Box		1.60		2.00		2.00		2.25		2.25		2.50		2.60		2.50
Lower Gear			877 / 839	6.00					877	6.00	395	9.00	395	9.00	395	9.00
Lower Pinion			876	2.25					876	2.25	327	4.00	327	4.00	327	4.00
Main Gear			736 / 316	6.00					884 / 318	8.75	396	12.00	396	12.00	396	12.00
Nose Piece	134	1.00	134	1.00	900	1.20	205	1.30	205	1.30	204	1.50	204	1.50	204	1.50

REPAIRS FOR LARGE WINDMILLS.—PUMPING AND GEARED.—Continued.

Description of Parts.	No. 5 Mill.		No. 6 Mill.		No. 7 Mill.		No. 8 Mill.		No. 8½ Mill.		No. 9 Mill.		No. 9½ Mill.		No. 10 Mill.	
	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price	No. of Castg	Price
Pitman, complete		2.95		3.50		3.80		4.00		4.30		5.00		5.40		5.90
Pulley	654	1.00	654	1.00	654	1.00	654	1.00	654	1.00	654	1.00	654	1.00	654	1.00
Regulating Weight	36	.30	635	.35	635	.35	636	.35	635	.35	635	.35	635	.35	635	.40
Regulating Rod		1.00		1.20		1.30		1.25		1.25		1.30		1.30		1.30
Regulating Rod Hinge		.25		.30		.30		.35		.35		.40		.40		.40
Regulating Rod Strap	650	.25	650	.25	699	.25	699	.25		.30		.30		.30		.30
Rear Box	167	.55	168	.50	169	.50	191	.60	781	.60	969 / 173	1.00	969 / 173	1.00	969 / 173	1.00
Rear Cap	103	.50	167	.60	170	.75	192	.80	193	.80	961 / 175	1.00	961 / 175	1.00	961 / 175	1.00
Sleeve Coupling			651	3.00					914	3.00	444	4.50	444	4.50	444	4.50
Sleeve	759	.60	C15	.70	C15	.70	760 / 774	1.00	761 / 774	1.00	762 / 774	1.00	760 / 774	1.00	760 / 774	1.00
Sleeve Box	153 / 151	.60	C93	.70	C93	.70	775	1.25	775	1.25	775	1.25	775	1.25	775	1.25
Spider only	731	7.00	731	7.00	849	7.50	793	8.00	285 / 723	8.00	707 / 220	10.00	286	10.00	286	10.00
Spider, complete		35.00		40.00		40.00		50.00		50.00		60.00		65.00		65.00
Spider, " geared				45.00						55.00		75.00		75.00		75.00
Shaft, Main		13.00		14.00		16.00		18.00		18.00		20.00		20.00		20.00
Slide Head Rods, set		1.00		1.00		1.30		1.30		1.30		1.50		1.50		1.50
Slide Fork and Rod	136	.60	579 / 136	.75	136	.75	228	.80	228	1.00	256	1.25	256	1.25	256	1.25
Sliding Hose	479	.40	627	.50	627	.50	478	.60	478	.60	478	.60	478	.60	478	.60
Skf., Painted		.10		.10		.11		.12		.12		.12		.12		.13
Stub End, complete		5.00		5.50		5.50		5.00		5.00		5.50		6.50		6.50
Swivel Box	147 / 148	.50	149 / 150	.60	149 / 150	.60	135 / 149	.70	147 / 149	.70	151 / 152	.80	151 / 152	.80	151 / 152	.80
Stem-off Lever		1.00		1.00		1.00		1.25		1.25		1.50		1.50		1.50
Shut-off Rod		.75		.75		.76		1.00		1.00		1.25		1.25		1.25
Suction or Back Plate	135	.60	195	.50	131	.60	131	.80	464	.70	197	1.00	197	1.00	197	1.00
Set Collar				1.00						1.40		1.60		1.60		1.60
Set Iron on Rec. Rod	72	.25	72	.25	102	.30	102	.30	102	.30	32	.35	89	.35	89	.35
Step Box, extension			231	3.50					784	3.50		5.00		5.00		5.00
Step Box, adjustable			486 / 489	4.75					486 / 489	5.00		6.00		6.00		6.00
Turntable, complete	275	40.00	275	30.00	275	30.00	274	40.00	274	40.00	278	45.00	279	45.00	279	45.00
Turntable, geared			271	35.00					271 / 281	50.00	364	75.00	964	75.00	964	75.00
Top Pinion			589 / 591	2.25					323	2.75		4.50		4.50	329 / 830	5.00
Truck Roll		.45	847	.45		.45	587	.50	587	.60	575 / 483	.60	575 / 483	.60	575 / 483	.60
Top Lever		.50		.60		.60		.75		.75		1.00		1.00		1.00
Top Lever Weight		.80		1.30		1.20		1.20	235	1.20		1.20		1.30		1.30
Top Lever Fulcrum		.25		.25		.25		.25	1004	.25	564	.30	564	.30	564	.30
Top Pitman Box	C20	.80	C21	1.00	C21	1.00	C21	1.75	C21	2.00		2.50		2.50		2.50
Truss Frame		3.50		3.75		3.25		3.50		3.50		4.00		4.00		4.00
Truss Rods, set		2.50		2.75		3.10		3.40		3.40		4.00		4.20		4.20
Truss Rod, Front		.90		1.10		1.15		1.25		1.25		1.50		1.60		1.60
Truss Rod, long		1.70		1.80		2.00		2.20		2.20		2.50		2.60		2.60
Tilt Bar, Wood		.40		.50		.55		.60		.60		.65		.70		.75
Tilt Bar Socket	86	.15	86	.15	85	.15	64	.10	85	.12	85	.12	85	.12	63	.12
Tilt Bar Lever	56	.45	56	.45	119	.50	119	.60	119	.60	100	.60	100	.60	100	.60
Vane		15.00		18.00		20.00		22.50		23.00		25.00		25.00		27.00
Vane Bows		3.00		3.50		4.00		4.50		4.50		5.00		5.00		5.00
Vane Braces, set		5.50		6.00		6.50		6.50		6.50		7.00		7.25		7.50
Wood Band		.03		.03		.03		.03		.03		.03		.03		.03

REPAIR PRICE LIST 10 FEET U. S. SOLID WHEEL WINDMILL.

No. of Casting	Description of Parts.	Price.
D 38	Angle Box, Outside	.30
E 30	Angle Box, Inside	.30
	Arm, Wood only	.80
	Arm, with Angle Bolts	1.40
	Blue Wood Rod	.80
40	Bed Plate	5.00
	Box Iron Work	16 50
	Crank Pin	1.00
E 37	Crank Plate	1 25
D 47	Clamp and Bolt	.25
53	Counter Balance Weight	.60
A 20	Connection End Guide	.30
	Connection Rod Caps	.30
	Yarn, set	18.00
	Fan, one	3.00
D 44	Front Box	.50
E 36	Front Cap	.50
25	Flat Bar Connection	.80
E 43	Fulcrum Iron	1.00
	Front Truss Rods (3)	.90
	Lever Connection Hook	.40
4	Lower Pitman Box	.70
Z 48	Main Weight	1.80
	Main Angle Lever	3 60
	Pitman, Wood only	2.20
D 44	Rear Box	.50
E 36	Rear Cap	.50
	Rear Truss and Brace Rods	1.50
E 40	Stem Bolt	.90
	Shut-off Lever	1 10
	Shut-off Rod	.50
	Shaft, Main	2.50
	Spider and Shaft	5 50
F 34	Spider only	3.00
35	Splice Iron	.25
	Stub End	3.50
805	Sleeve	.60
806	Sleeve Box	.90
E 49	Sliding Hose	.25
	Slat	.10
D 29	Truss Cap Hinge	.40
F 31	Swivel Box	.60
F 45	Turntable	2.00
	Top Lever	.60
E 41	Truss Cap, Iron	1.00
D 71	Top Lever Weight	1.30
	Top Pitman Box	.60
	Truss Legs (2)	1.00
H 11	Vane Socket	1 80
	Vane Shaft	2.00
	Vane, large	5.00
	Vane, small	1.50
E 46	Vane Tie Casting	.40
	Vane Clip and Bolt	.25
	Vane Bows	1.50

PATENT IMPROVED WELL-DRILLING AND PROSPECTING MACHINE.

This cut represents one of our Improved Well-Drilling Machines. These Machines are thoroughly well made, none but the very best material being used in their construction. We make a speciality of these drills and carry a good stock of them and all their parts. They are especially adapted to the needs of the country for well making and mineral prospecting. One span of horses is sufficient to transport both drill and horse power from place to place.

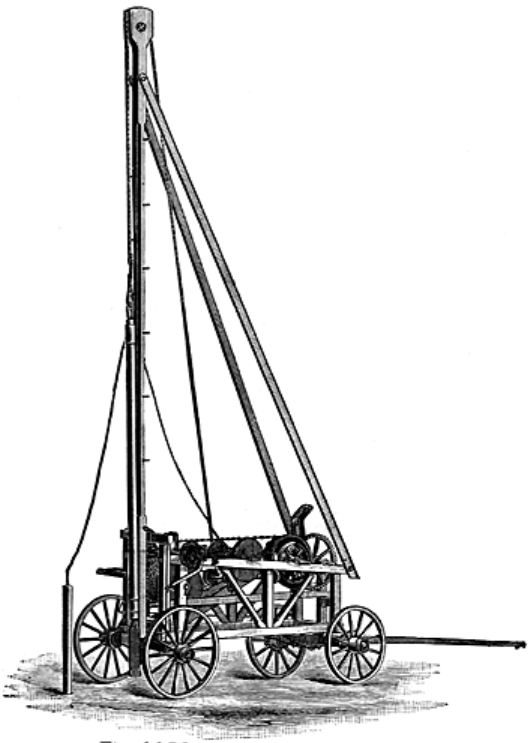


Fig. 1189.

PRICE LIST NO. 1 DRILLING MACHINE.

For horse or steam power, for drilling from 200 to 350 feet deep; 200 feet hawser laid drill rope 1¼ inch; 200 feet ½ inch bucket rope; two 6 inch "Z" drills; one drill rod, 10 feet long 3 inches in diameter; two drill wrenches; one loop; one sand-bucket; one horse power; two tumbling rods; one sweep; one lead pole; four links to stake down horse power; one tool-box; one sledge; one monkey wrench; one hammer; one oil-can; one cold-chisel; three extra chain links; six ½ inch nuts; three ⅜ inch nuts; three ½ inch box bolts; two ⅜ inch bolts; six washers.

Price,	complete, for horse power, not mounted	430.00
"	complete, for horse power, mounted	480.00
"	add for engine	340.00
"	complete, with steam engine and boiler, including belt, both drill and engine mounted	820.00

☞No. 1 Drilling Machine can be used to drill 500 feet deep or more by adding rope.

NO. 2 DRILLING MACHINE.

For drilling from 350 to 500 feet deep; 350 feet hawser laid drill rope, 1¼ inch; 350 feet bucket rope, ½ inch; two 6 inch "Z" drills; one drill rod 10 feet long, 3 inch; one loop; one horse power, with tools and extras; same as No. 1.

Price,	complete, for horse power, not mounted	460.00
"	complete, for horse power, mounted	510.00
"	complete, with steam engine and boiler, both engine and drill mounted	850.00

Send for Special Catalogue.