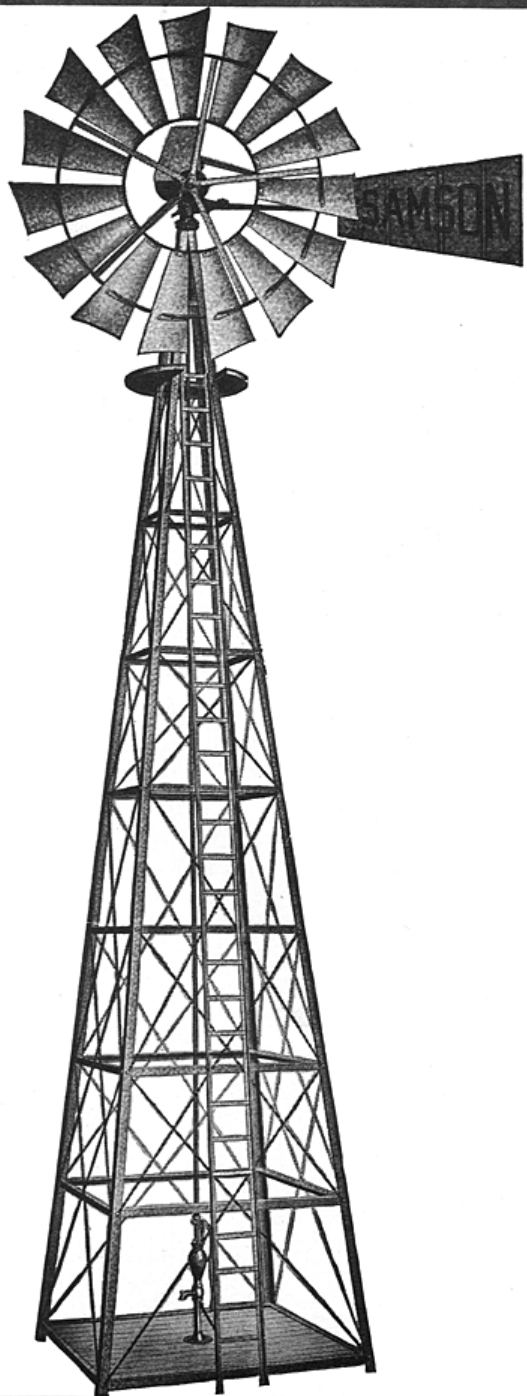


SAMSON

Oil Rite Windmills

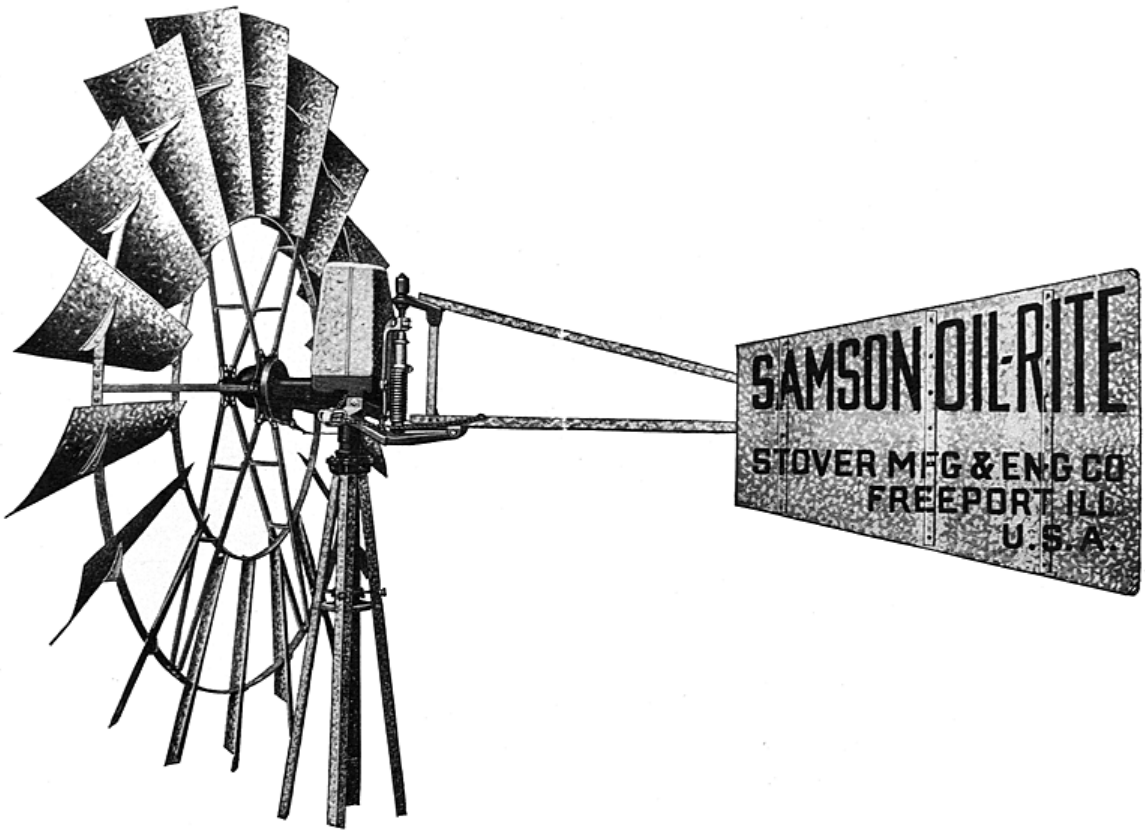
and

Ideal Towers

STOVER MFG. and ENGINE CO.
Freeport, Ill.
U.S.A.

Catalog
No. 41

★ Samson Oil-Rite Windmills ★

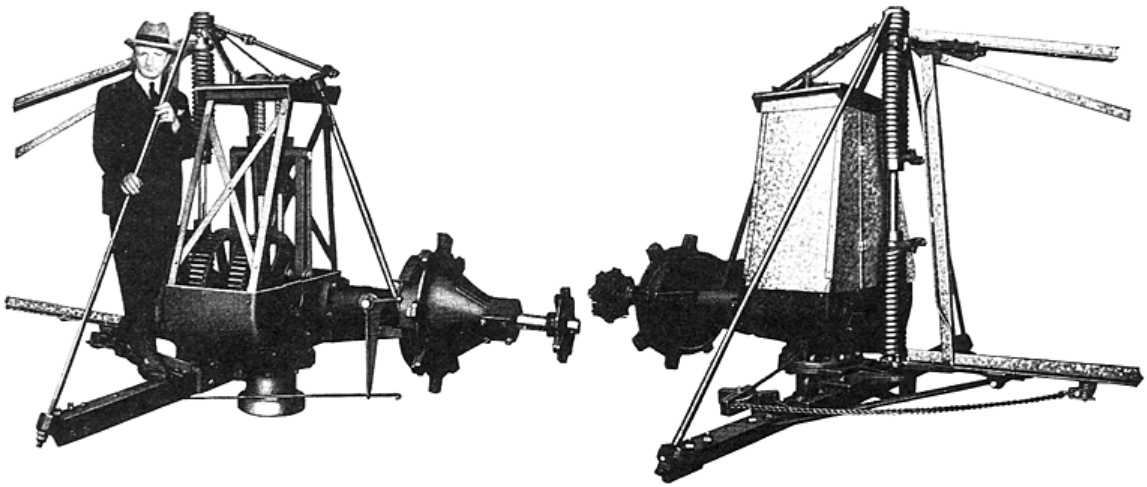


Specifications for 6, 8, 9, 10 and 12 foot Samson Oil-Rite Windmills

Ranch Type-Model "S" with Timken Roller Bearings

No. of Mill	Size of Mill	Back Geared	No. of Arms	No. of Sections	Stroke in Inches	No. of Fans	Approximate Ship. Weight in Pounds	Approximate Gr. Wt. Packed For Export	Code
6-S	6 ft.	3 6/10 to 1	4	4	6	12	335	425	Adder
8-S	8 ft.	3⅓ to 1	5	5	6-8	15	450	550	Ace
9-S	9 ft.	3⅓ to 1	5	5	6-8	15	475	580	Abba
10-S	10 ft.	3⅓ to 1	6	6	8-10	18	625	650	Acre

★ Samson Oil-Rite Windmills ★



12, 14, 16, 18 and 20 ft. Samson Oil-Rite Windmills Model "S"-Ranch Type with Timken Roller Bearings

The above illustrations actually represent two views of the 20 ft. Model "S" Samson, which are of the same general construction as all other Samson Model "S" Mills, therefore, the descriptions in the following pages apply to the larger as well as the smaller sizes.

All Samson Mills from 12 to 20 foot inclusive are of the same design as the 20 foot shown above, which are all equipped with truss construction for the governor and vane rail support.

The interchangeable feature upon the old and present models is of decided importance since it permits converting old Mills into the present modern type at a nominal expense where the interchangeable parts can be salvaged.

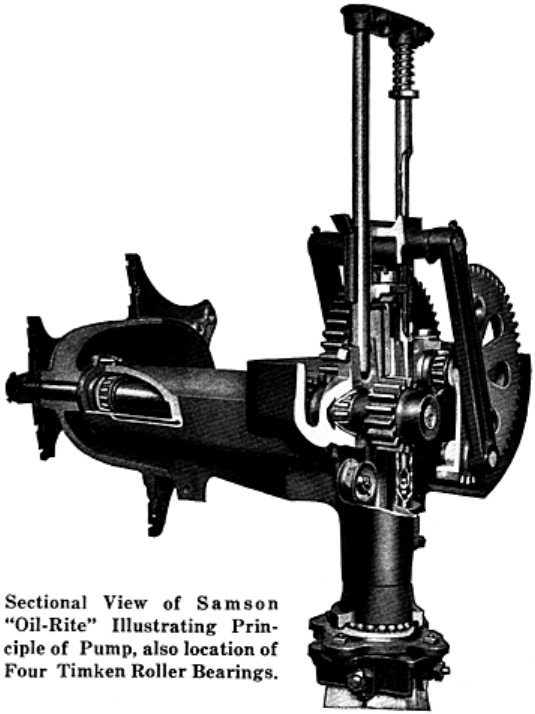
Under the heading of INTERCHANGEABILITY upon the lower left hand corner of page 9 we have explained in detail the interchangeable parts upon the old and present types of Mills.

SPECIFICATIONS

No. of Mill	Size of Mill	Back Geared	No. of Arms	No. of Sections	Stroke in Inches	No. of Fans	Approximate Ship. Weight in Pounds	Approximate Gr. Wt. Packed for Export	Code
12-S	12 ft.	3⅓ to 1	7	7	8-10-12	21	1215	1350	Aden
14-S	14 ft.	3 1/5 to 1	8	8	10-12-14	24	1775	2000	Abel
16-S	16 ft.	3 to 1	8	8	12-14-16	24	2435	2710	Andre
18-S	18 ft.	3 to 1	8	8	12-14-16	24	2845	3095	Argo
20-S	20 ft.	*3 to 1	8	8	14-18-20	24	4875	5700	Abbot

*Can be furnished back geared 2½ to 1 upon special order.

★ Samson Oil-Rite Windmills ★



Sectional View of Samson "Oil-Rite" Illustrating Principle of Pump, also location of Four Timken Roller Bearings.

AUTOMATIC OILING SYSTEM

The lubrication of the various parts is accomplished as follows: The oil is poured into the gear case, which submerges the lower part of the double gears, including the wrist pins when at the bottom of stroke. The rotation of the gears carries the oil up and floods the pinions, and the oil running down over the inside of the gears floods the gear shaft.

OIL PUMP

One of the outstanding features of the SAMSON "OIL-RITE" is the extreme simplicity, efficiency, and practicability of the oil pump.

One of the guide rods consists of a hollow steel tube which forms a pump cylinder. The plunger is equipped with a pin that travels in a slot in the steel tube and the plunger is raised by the pin in the plunger coming in contact with the cross-head upon the up stroke.

The collar attached to the pump plunger is of the correct weight to carry the plunger downward fast enough to force the oil out of both sides of the slot in the top of the pump cylinder.

The 20 foot Mill is equipped with a double pump; in other words, each guide rod forms a pump as described above. All other sizes are supplied with a single pump as shown in the accompanying illustration.

The object of the pump is to keep the top of the cross head that acts as a reservoir constantly filled with oil which lubricates the guide rods and upper pitman bearings.

The combination cross head and reservoir in passing over the guide rods floods the rods with oil and the upper pitman bearings are lubricated from channels in the cross head leading to the pitman bearings.

The oil discharged from the pump after filling the cross-head reservoir flows into a trough that surrounds the casting into which the crosshead guides are anchored and flows forward to the front Timken Roller Bearing through a channel pitched toward the spider.

AUXILIARY OILING SYSTEM

12, 14, 16 and 18 Foot MILLS

The oil works through the bearing, and is returned to the gear case through a channel beneath the wheel shaft pitched toward the gear case.

Upon the 12, 14, 16 and 18-foot Mills an auxiliary oil pump is located upon the bottom of the crosshead, which provides, for complete auxiliary lubrication, if, for any reason, the pump in the cross-head guide should fail to operate.

The incorporation of the Timken Bearings gives the purchaser a free running Mill, the life of which is practically indefinite, as well as one that will pump water in unusually light breezes.

Castelated nuts are used upon the shaft carrying the large gears. The pinions are held in position upon the shaft with half-moon keys and taper pins.

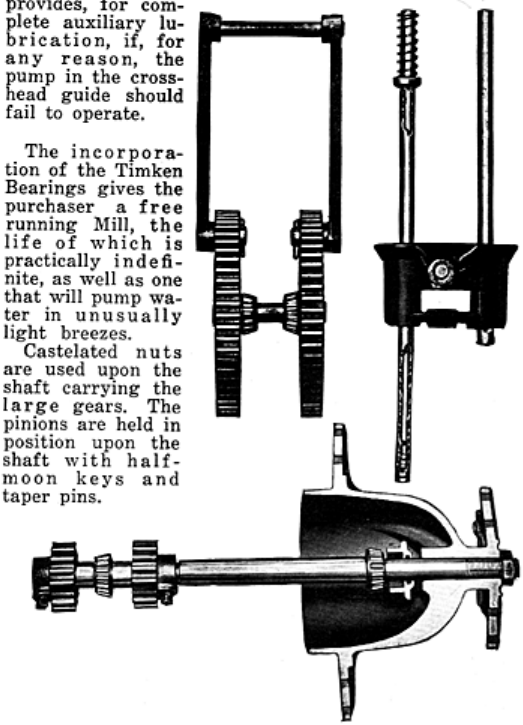
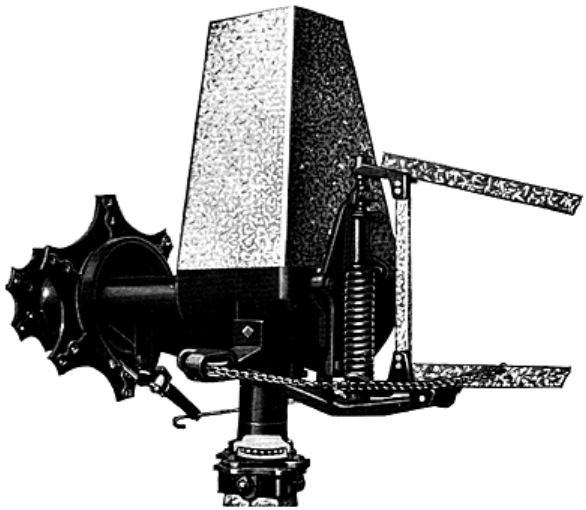


Illustration showing comparatively few working parts upon the Samson Oil-Rite Mill as well as the location of the four Timken Roller Bearings

★ Samson Oil-Rite Windmills ★



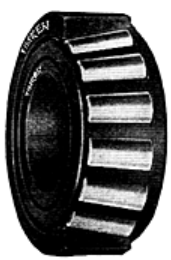
Assembled head of Samson Oil-Rite showing the location and detail of the governor

THE GOVERNOR

One of the most important features of a windmill is the governor. The governor must be carefully and correctly designed to perfectly regulate the speed of the wheel and keep the mill pumping in varying and shifting winds. The governor on the Samson is adjustable and can be set to perfectly regulate the speed in any wind velocity.

The governor on the SAMSON "OIL-RITE" Model "S" mill is so efficient that it operates equally as well in high and varying winds as in moderate winds.

It consists of a steel coiled spring, one end of which engages with the vane head and the other with the mill head. It not only performs the work of a perfect regulator for the mill, but acting with spring buffer between the wheel and vane, protects the mill and tower from injury in violent storms.

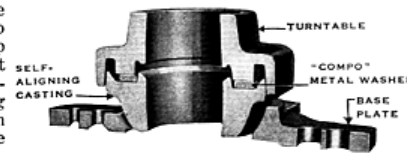


TIMKEN ROLLER BEARINGS

The Timken Bearing differs essentially from other types of anti-friction bearings in that it consists of tapered rolls which roll between the outer tapered surface of a cone and the inner tapered surface of the cup. A one-piece cage is used to retain the rollers in position and to preserve the assembly. This construction has been followed with only minor refinements for more than 25 years.

Timken roller bearings are made of special steel to conform with the severe conditions under which they must sometimes operate. They carry the thrust load without thrust washers and will never need replacement as they will last as long as the mill, as they operate continuously in a bath of oil. The adoption of Timken roller bearings contributes in a large way toward the smooth easy running of the mill and is one of the features that helps to make the Samson pump water in light breezes. The slight wear that occurs is confined to the bearing only with no wear whatever on the main shaft.

TURNTABLE (Sectional View) Ball and Socket Type



The base plate which is bolted to the tower cap forms a socket and the self-aligning casting that oscillates in the base plate forms the ball.

Between the machined surface of the oscillating casting and the turntable is an impregnated bronze ring of special "Compo" metal which is submerged in oil carried in a recess in the oscillating casting which serves as a lubricating washer, eliminating friction and binding.

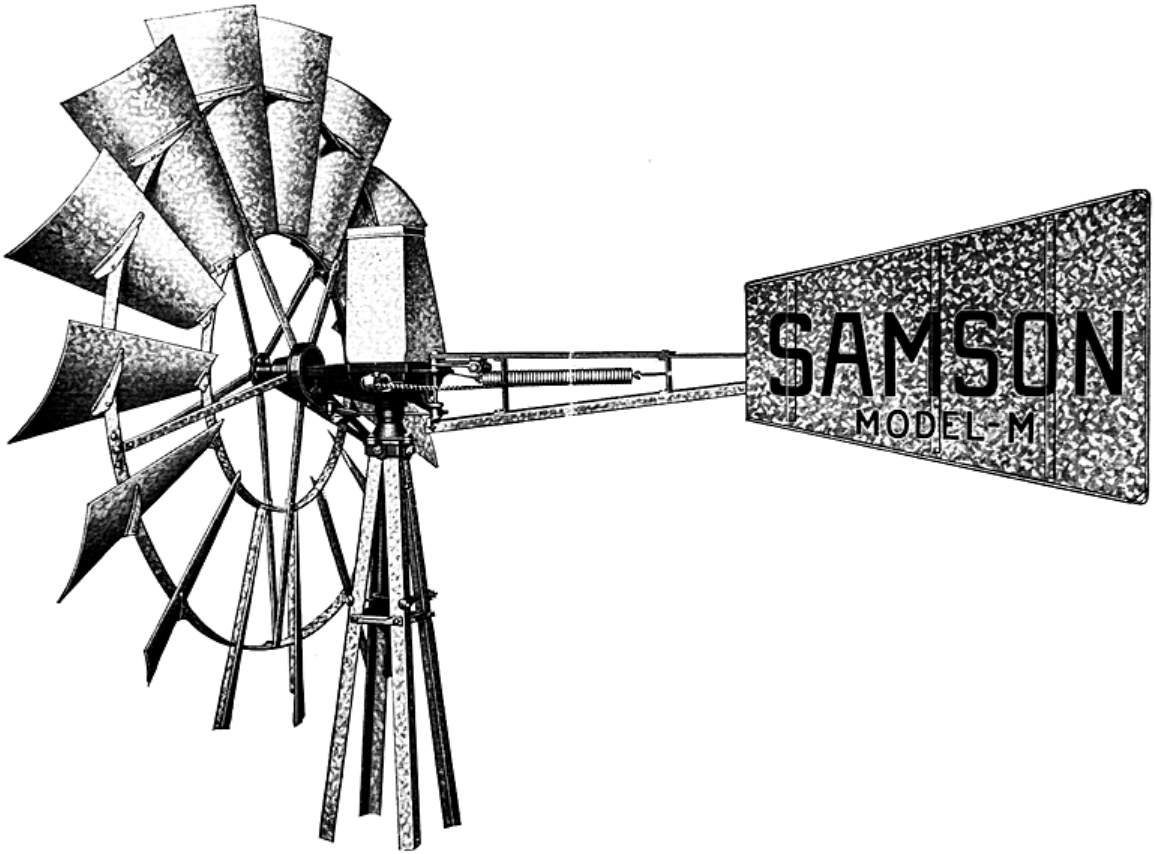
The turntable shroud prevents rain, sleet and snow from entering the turntable, and it is provided with a spring oiler for replenishing oil in the ring casting recess that carries the "Compo" metal washer.

The principle provides a smooth, free-operating, self-aligning turntable which insures the mill will respond to the slightest wind and also insures the mill setting level at all times and avoids binding irrespective of the fact the tower may be slightly out of plumb.

DOUBLE GEARS MOUNTED UPON TIMKEN ROLLER BEARINGS

The illustration of the double gears that have been distinctive on the famous SAMSON since it was originally designed are shown herewith. This illustration shows the sharp and clean cut teeth always affording perfect meshing with the double pinions with which they engage. Shows also the end of the shaft or bolt used to connect the two gears, and which is supplied with castellated nuts and cotter key, which positively insures a permanent installation which cannot be disturbed and which will not need adjustment even after years of service.

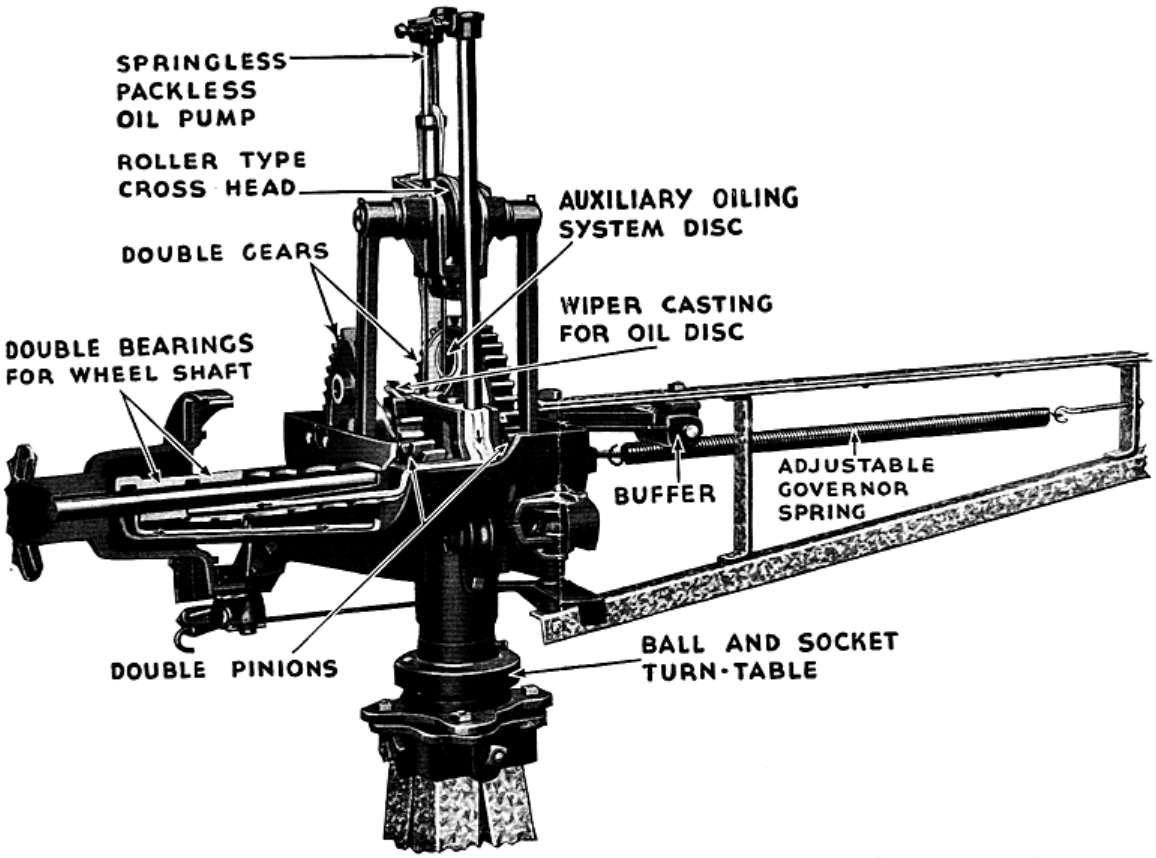
★ Samson Oil-Rite Windmills ★



Specifications for 6, 8, 9, 10 and 12 foot Samson Oil-Rite Windmills (Model M) with Plain Bearings

No. of Mill	Size of Mill	Back Geared	No. of Arms	No. of Sections	Stroke in Inches	No. of Fans	Approximate Ship. Weight in Pounds	Approximate Gr. Wt. Packed for Export	Code
6 M	6 ft.	3⅓ to 1	4	4	6	12	275	400	Manse
8 M	8 ft.	3⅓ to 1	5	5	6-8	15	350	450	Malay
9 M	9 ft.	3⅓ to 1	5	5	6-8	15	380	550	Malta
10 M	10 ft.	3⅓ to 1	6	6	8-10	18	525	740	Marne
12 M	12 ft.	3⅓ to 1	7	7	10-12	21	1050	1250	Manit

★ Samson Oil-Rite Windmills ★



AUTOMATIC LUBRICATION

Since the principal mechanism is located high in the air and out of easy observation, a Windmill with a positive and dependable automatic oiling system is an important factor.

The main frame forms a reservoir that holds a sufficient amount of oil to lubricate the Mill for one year. A hot galvanized sheet metal helmet completely encloses the reservoir and covers all working parts, making it dirt, rain, sleet and snow proof. No water can creep in to dilute the oil, no dust can blow in to grind out the bearings.

The automatic lubricating system starts to function as soon as the Mill is placed in operation and continues until the Mill is stopped. There is a constant and positive supply of oil flooding every movable part at all times. The oil after being delivered to the desired parts of the Mill returns to the reservoir to be re-circulated.

THE PRINCIPLE OF LUBRICATION

The lubrication of the various parts is accomplished as follows: The oil is poured into the gear case, which submerges the lower part of the double gears, including the wrist pin when at the bottom of stroke. The rotation of the gears carries the oil upward and floods the pinions.

One of the outstanding features of the SAMSON Model "M" is the extreme simplicity, efficiency and practicability of the oil pump.

One of the guide rods consists of a hollow steel tube which forms a pump cylinder. The pump plunger is equipped with a pin that travels in a slot in the top of the steel tube and the plunger is raised by the pin in the plunger coming in contact with the crosshead upon the up stroke.

The collar attached to the pump plunger is of the correct weight to carry the plunger downward fast enough to force the oil out of both sides of the slot in the top of the pump cylinder.

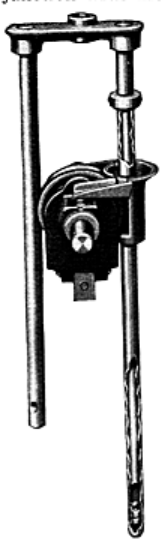
★ Samson Oil-Rite Windmills ★

The object of the pump is to keep the top of the crosshead that acts as a reservoir constantly filled with oil. The combination crosshead and reservoir by passing over the pump guide rod floods the rod with oil and the crosshead roller carries oil to the opposite guide rod.

The oil discharged from the pump after filling the crosshead reservoir flows into the two channels in the crosshead and is delivered to two small cups directly under the channels where it overflows to lubricate the top crosshead bearings and drops down into a trough around the guide rods, lubricating the bearings between the large gears and pinions, flows forward through a channel pitched toward the spider to lubricate the two forward bearings; all oil working out of either end of the two spider shaft bearings, returns to the frame in a channel in the bottom of the spider bearing casting pitched toward the gear case or main reservoir. (See explanatory view of oil travel on page 7.)

AUXILIARY LUBRICATING SYSTEM

If for any reason the pump should fail to function, the auxiliary lubricating system which operates in conjunction with the pump will positively furnish lubrication for the Mill, therefore, with this dual system the Model "M" Windmill is positively assured of lubrication as soon as placed in action. The principle of the auxiliary system is as follows:



Cross Section View Showing Principle of Auxiliary Oil Pump, Oil Reservoir, Oil Delivery Channels—Located on Both Sides and the Roller Crosshead.

Two loosely attached round sheet metal discs operate upon shoulder studs located on the inside of both large gears. As the gears revolve, the metal discs are submerged in oil carried in the main frame and the oil picked up by the discs is removed by the disc coming in contact with a wiper casting attached to the main frame.

The oil travels from the wiper casting into the trough around the guide rods to provide lubrication in the same manner as when furnished by the pump as described above. (See explanatory illustration on page 7.)

ROLLER TYPE CROSS HEAD

The roller type crosshead shown in the illustration to the left, operates with the least friction possible, reduces wear at that point to a minimum, avoids any possibility of cutting out, eliminates frequent replacements, increases the life of the Mill and reduces operating costs.

TURNTABLE

The base plate which is bolted to the tower cap forms a socket and the self-aligning casting that oscillates in the base plate forms the ball.

Sectional View, Ball and Socket Type Turntable

Between the machined surface of the oscillating casting and the turntable is an impregnated bronze ring of special "Compo" metal which is submerged in oil carried in a recess in the oscillating casting which serves as a lubricating washer, eliminating friction and binding.

The turntable shroud prevents rain, sleet and snow from entering the turntable, and it is provided with a spring oiler for replenishing oil in the ring casting recess that carries the "Compo" metal washer.

THE GOVERNOR

One of the most important features of a windmill is the governor. The governor must be carefully and correctly designed to perfectly regulate the speed of the wheel and keep the mill pumping in varying and shifting winds. The governor on the Samson is adjustable and can be set to perfectly regulate the speed in any wind velocity.

The governor on the SAMSON Model "M" OIL-RITE" mill is so efficient that it operates equally as well in high and varying winds as in moderate winds.

It not only performs the work of a perfect regulator for the mill, but acting with spring buffer between the wheel and vane, protects the mill and tower from injury in violent storms.

DOUBLE GEARS

The illustration of the double gears that have been distinctive on the SAMSON since it was originally designed are shown herewith. This illustration shows the sharp and clean cut teeth always affording perfect meshing with the double pinions with which they engage. Shows also the end of the shaft or bolt used to connect the two gears, and which carries a cotter key that positively holds the gear shaft in position.

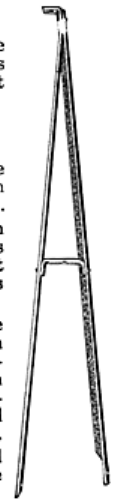
Enlarged View of Double Gears Showing Provision for two Strokes

★ Samson Oil-Rite Windmills ★

THE BUFFER

The accompanying illustration shows the style of Buffer used upon the Samson Model "M" Oil-Rite Mill. The purpose of which is to avoid breakage by sudden closing or throwing of the Mill into gear.

The Buffer or steel spring is placed upon the vane rail near the hinge of the vane and absorbs the shock and jar which otherwise might result in either damage to the wheel or vane rail.



WHEEL ARMS

The wheel arms upon the Samson Oil-Rite Model "M" Mill are made up of a combination of angle and flat steel securely riveted together.

The wheel arms rest in a recessed bed upon the spider which reinforces the wheel arms which are held in position with galvanized bolt and lock washers. The size of the Mill governs the number of wheel arms used.

The two rims that carry the wheel sails, are bolted to the wheel arms and the outer rim encompasses the arms where the best opportunity for bolting is afforded. The inner rim is bolted to the bridge nearest the spider. Galvanized bolts and heavy lock washers are used upon the wheel sections to prevent loosening.

The distance the rims are placed apart and the number of bridges used is governed by the size of the Mill.

INTERCHANGEABILITY

Samson Babbitt or Hyatt Roller Bearing Windmills in the field can be converted into either the Samson Oil-Rite Model "S" or Samson Oil-Rite Model "M", by salvaging the following parts.

The wheel sections, wheel arms, vane, vane-rail, wood pump rod and governor spring upon the Samson Babbitt, Samson Hyatt Roller-Bearing and Samson Oil-Rite Model "S" Mills are interchangeable, therefore, to convert either the Samson Babbitt and Hyatt Roller-Bearing Mill into the Samson Oil-Rite Model "S" it is necessary to purchase only the complete head as assembled, plunger, pull-out wire and box of fixtures.

The wheel sections and vane of the Samson Babbitt, Samson Hyatt Roller Bearing, and Samson Oil-Rite Model "S," are the only parts that are interchangeable upon the Samson Oil-Rite Model "M."

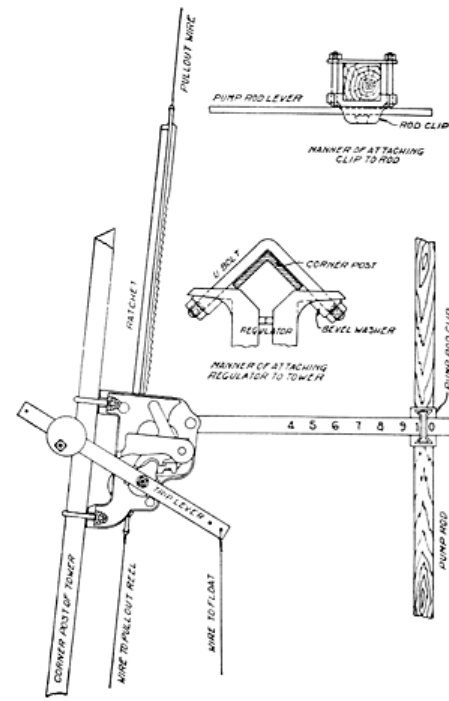
Ball bearing turn tables are not furnished upon replacement heads.

The interchangeable feature upon the old and present types of mills is one that will be appreciated by the present owner of an old mill, upon which the parts can be salvaged, since it gives him an opportunity to convert his mill into the present type at a nominal cost.

STOVER WINDMILL REGULATOR

Automatic Ratchet Type

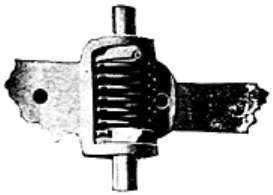
The Stover Regulator is a simple device for use in connection with a windmill to automatically regulate or control the supply of water in the tank. When the tank is filled with water it pulls the mill out of gear and stops the pump, thus preventing an overflow, a mud hole, waste of water and unnecessary wear to both mill and pump. When a few inches of water have been taken from the tank it throws the mill in gear and allows it to run just long enough to refill the tank and no more. The tank is thus kept full of water, affording abundant supply for stock, and preserves the tank against shrinkage from becoming empty. The man or boy may forget to put the mill in gear in time, allowing the stock to suffer and the tank to go dry, or to throw it out when tank is full, thus wasting water, creating a mud hole, unnecessary wear, etc. **The Stover Regulator never fails.** No windmill is complete without it and no other equals the Stover.



No. 1 Stover Windmill Regulator for 8 and 10 foot Mills, weight 35 pounds

No. 2 Stover Windmill Regulator for 12, 14, 16 and 18 foot Mills, weight 65 pounds

★ Samson Oil-Rite Windmills ★



THE BUFFER

The Buffer illustrated is the style with which the Samson Model "S" Mill is equipped. Its purpose is to avoid possible breaking by the sudden closing or throwing the Mill into gear. The Buffer or steel wire spring is placed upon the vane rail near the hinge of the vane. It absorbs the shock or jar, which otherwise might result in damage to vane rail or wheel.

The Buffer for the Model "M" Mill is illustrated upon page 9.

THE PULL-OUT DEVICE

The Pull-Out Device as illustrated, is supplied with the Samson Model "S" Mill is of the ratchet type with large swivels and heavy wire for connecting to the upper pullout chain. This device is designed so that it does not pass through the oil well but down through the mast pipe eliminating complications and giving the greatest possible efficiency.

The Pull-Out Device upon the Model "M" Mills is of different design.

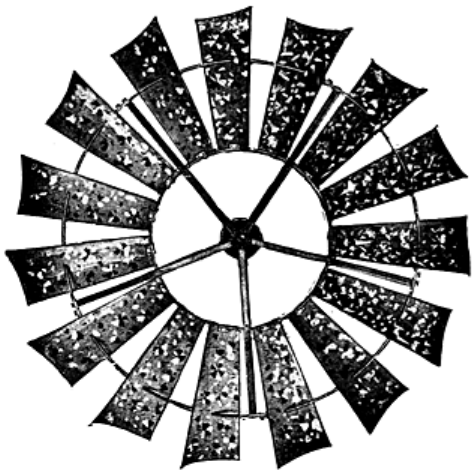
THE WHEEL

Comparatively few people outside of those engaged in windmill manufacture appreciate the difficulties to be overcome in constructing a perfect wind wheel. Considering it by itself and independently of the parts to which it delivers its power, it embodies many vital principles, the ignoring of any one would greatly lessen the value of the entire machine.

Primarily, it partakes of the nature of the sails of a ship on the water. But in that case the sailor is ever present to trim and tack for each veering breeze and changing of the wind.

The wheel must be made once for all, its sails ready set to be propelled by the lightest zephyr, or to do duty and shield itself from destruction at the same time in the violent storms. It must automatically shift for position, while its counterpart upon the sea is directed by human intelligence.

Passing over the matter of strength, which, of course, must be ample for great resistance in time of need, it must be light, to avoid strain and unnecessary wear, the happy medium must be found in the amount and shape of



sail or wind surface, too much or too little rendering it alike ill adapted to securing efficient service; and the sails must have a definite curvature and be set to a definite angle for any particular duty they are required to do.

It will readily be seen that the making of a wheel which yields the highest possibilities is not a haphazard piece of work, and can only be accomplished by comprehensive experiments to reveal exact requirements upon every particular point.

THE WHEEL'S SAILS

Upon the peculiar cutting, the requisite size, the shape, exact curvature and setting at a certain designated angle of the fan or sail depends, in large part, the special pre-eminence which the Samson wheel enjoys. Every feature that could contribute to the single purpose of appropriating the power of the air has been subjected to crucial tests, the elements of value retained and applied in their proper form and positions. Our exhaustive tests have convinced us there is not a wheel that will anywhere near approach the merits of the Samson.

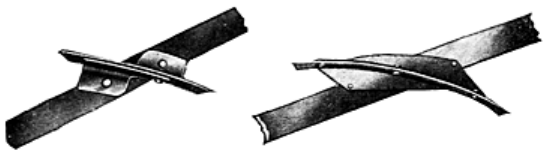
THE BRAKE

It is a flexible steel band, encircling about three-quarters of the flange of spider or hub, and holds with a positive grip so that the wheel stands still when out of gear. Turning the mill out of gear applies the brake, the connection is made adjustable, so that much or little tension can be applied to suit. To properly adjust, loosen the nut on the bolt that connects the brake-lever and band. Pull the mill out of gear, then adjust the tension on brake-band tight enough so that the wheel cannot be turned by hand.

★ Samson Oil-Rite Windmills ★

SAIL FASTENINGS

Notice how securely the sails are fastened to the rim and bracket in position. The sail clips which fasten the sails to the rims are of extra length and there are two of



them, one on either side, giving double strength at that particular point. It should be remembered that in each case a second clip of the same size and form as the one appearing is similarly placed on the opposite side of the fan.

WHEEL ARMS, RIMS AND BRIDGES

For Samson Model "S"

The design of the wheel arms are in keeping with the remainder of the mill, are securely attached to the spider with galvanized bolts and lock washers in a recessed bed that supports and reinforces the arm. The size of the mill governs the number of wheel arms, arm bridges and sections.

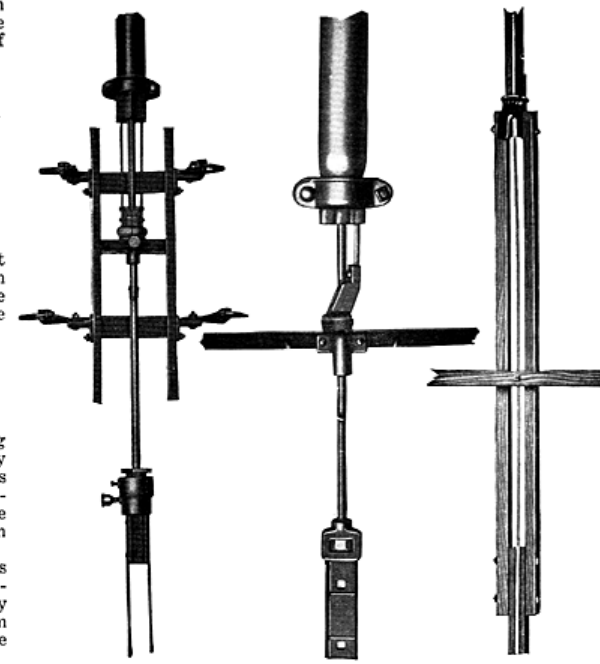
Securely bolted to the arms are the two rims which carry the sails. The outer one encompasses the arms, where the best opportunity for secure bolting is afforded. The inner rim is fastened in like secure manner to one of the bridges near the spider.

The distance the rims are placed apart and the number of bridges used is governed by the size of the wheel. Heavy lock washers are used on all nuts to avoid any possibility of nuts loosening.

See special illustration for wheel arms upon Model "M" as shown upon page 9.

THE VANE

The vane on the Samson Mills will not sag or twist out of shape, are of the proper size and design to control and regulate the wheel under all conditions.



PLUNGERS AND WOOD ROD CONNECTION

Illustration of round plunger and wood pump rod connection furnished upon 12-M, 12-S, 14-S, 16-S, 18-S and 20-S type "S" Samson Oil-Rite Windmills.

Round plunger and wood pump rod connection with which 8-S, 9-S and 10-S type "S" Samson Oil-Rite, and 8-M, 9-M and, 10-M Samson Oil-Rite Type "M" Windmills are equipped.

Angle steel plunger and wood pump rod connection as used upon 6-S 6-foot Samson Oil-Rite.

The Samson Mill can be mounted upon any foreign make of tower. It is only necessary to know the make of the tower, and whether it is of the three or four-post type. The necessary tower cap can be furnished at fixed extra charge.

★ Samson Oil-Rite Windmills ★

STOVER CABLE BRACED TOWERS

Are Better—There is a Reason.

The cross girts and braces, especially the braces, are the life of a windmill or radio tower, and the braces upon our towers being of twisted wire brace (cable) type twisted from the center toward each end, "give" just enough under heavy strains and stresses, so that each and every brace holds like the roots and tendons upon a strong tree.

Upon towers braced by flat or round members, where bending and punching is done in order to secure correct length, unless such bending and punching is absolutely 100% accurate, very few of the braces help hold at one time, with the result that bolts or brace ends shear off and a wreck ensues.

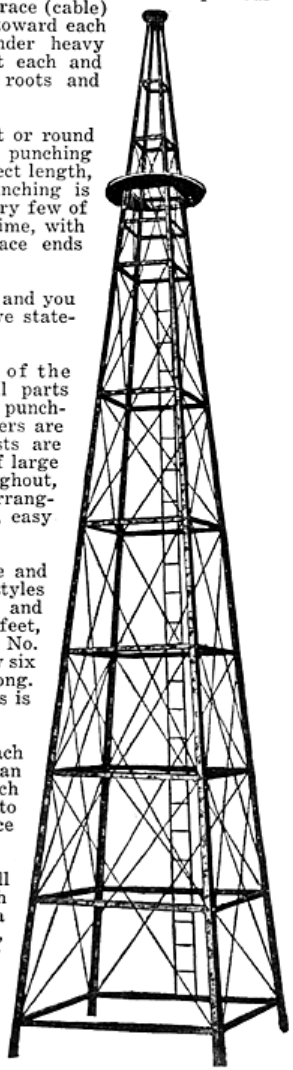
Just study this proposition and you will see how true is the above statement.

Stover steel towers are of the double girted type, with all parts thoroughly galvanized after punching; all nuts, bolts and washers are cadmium plated; anchor posts are long and anchor plates are of large area, hot galvanized throughout, and the climbing ladder is arranged in the side of the tower, easy to climb.

For windmills of 10 ft. size and smaller, we manufacture two styles of towers—No. 1 with girts and diagonal braces every five feet, corner posts 10 feet long, and No. 2 with girts and braces every six feet, corner posts 12 feet long. The steel work in both towers is of the same weight.

Upon the Stover towers, each diagonal brace is fitted with an individual tightener, and each brace is securely clamped to the cross girt where brace crosses same.

When purchasing a windmill outfit quite naturally you wish to have it installed upon a reliable and well built tower, and we ask of you to consider well STOVER CABLE BRACED TOWERS before making a purchase.

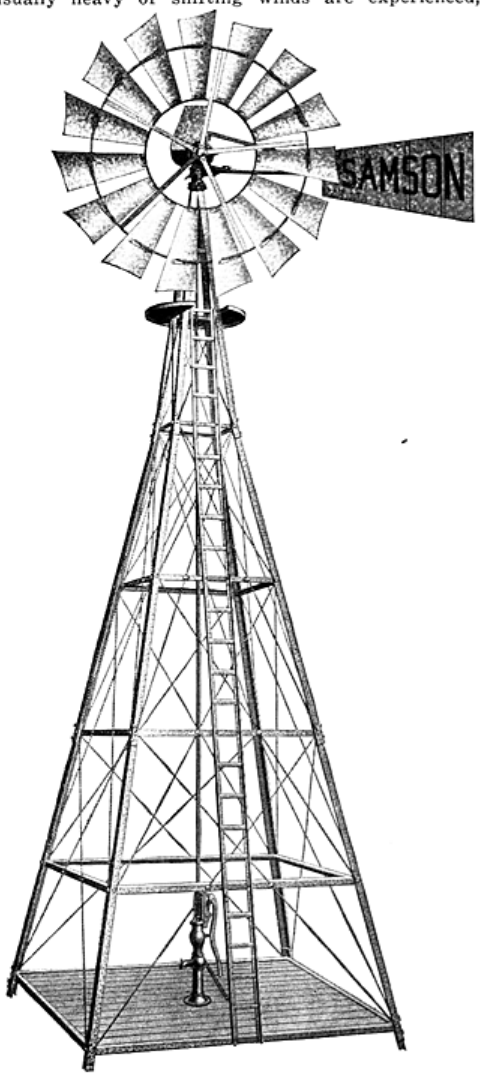


REGULAR SPREAD

SPECIAL SPREAD TOWER

The Special Spread Tower as illustrated is of the same construction as Regular Spread, therefore, the detailed description of the Regular Spread Tower also applies to the Special Spread.

The Special Spread Tower is recommended where unusually heavy or shifting winds are experienced, or where the outfit is to be placed over a well with a large opening. The advantage of the Special Spread Tower for the above referred to installations are obvious.



★ Samson Oil-Rite Windmills ★

Stover Taper Tank Towers

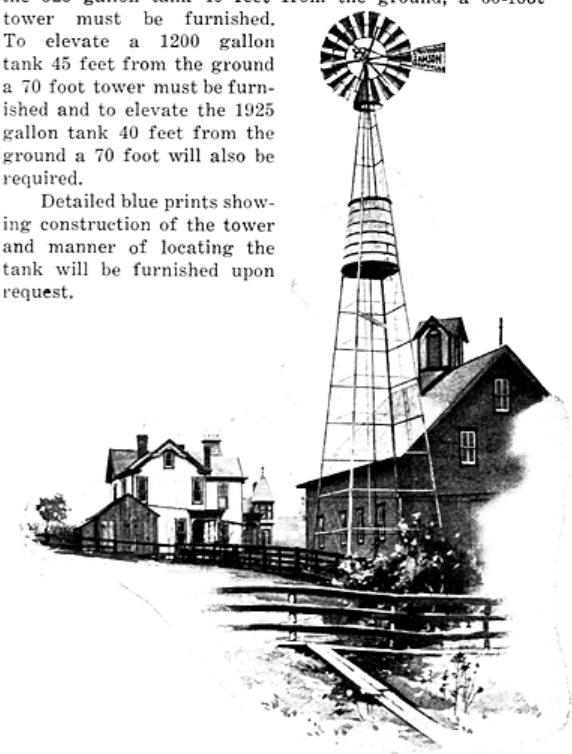
The taper tank unit is a practical installation for many purposes where an overhead supply of water is required and where the capacity of the tanks that can be supplied is sufficient.

Built in three sizes. For tanks with approximate capacities of 525, 1200 and 1925 gallons. For 6, 8, 10 and 12-foot Mills. The 525 gallon tank sets in the second section of the tower; the 1200 gallon tank in the top half of the third section; and the 1925 gallon tank in the third section.

The towers are built in 10-foot sections; therefore, the bottom of the tanks can be raised, 10, 20, 30 feet, etc., from the ground, with the exception of the 1200 gallon tank which sets in the top half of the third section; therefore, that particular tank can be elevated 5, 15, 25, 35, 45 feet, etc., above the ground.

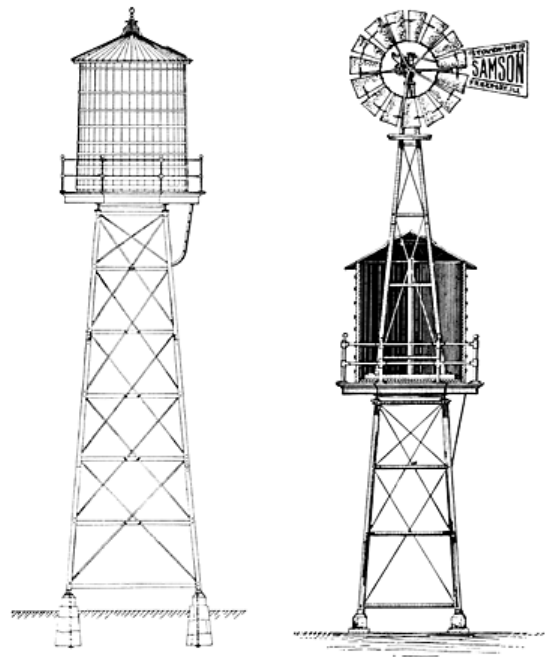
The above must be taken into consideration when figuring the height of the tower. As an illustration, to elevate the 525 gallon tank 40 feet from the ground, a 60-foot tower must be furnished. To elevate a 1200 gallon tank 45 feet from the ground a 70 foot tower must be furnished and to elevate the 1925 gallon tank 40 feet from the ground a 70 foot will also be required.

Detailed blue prints showing construction of the tower and manner of locating the tank will be furnished upon request.



Stover Sub-Structures

CLASS A1 AND C



Stover sub-structures are manufactured in two sizes described as Class "A" which is capable of carrying a tank measuring 8 feet in diameter and 10 feet in height, which has a capacity of 3600 gallons and the Class "C" which is capable of carrying a tank measuring 12 feet in diameter and 14 feet in height, which has a capacity of 10,000 gallons.

Both sub-structures are of the butt-splice type of construction, are manufactured in 12-foot sections and can be furnished up to and including 84-foot in height.

Both sub-structures can be furnished with either wood or steel joists for supporting the tank.

Shown above to the left is an illustration of a complete sub-structure installation, and to the right a sub-structure with a Windmill anchored upon the interior of the tank which is a practical installation for many purposes.

Either type can be supplied with or without the balcony or balcony railing, as illustrated and with anchorage to be buried in the ground or for mounting the sub-structure upon cement piers.

★ Samson Oil-Rite Windmills ★

IDEAL GALVANIZED STEEL TOWERS
(In Detail)

A Few of the Prominent Features Singled Out and Emphasized

Clamps: To further strengthen and stiffen the Ideal Towers, each cable wire brace is securely clamped to the steel girts at the point near the center where they pass over the same. This is done to keep the girts always in line and to prevent any possible springing under any lateral or side pressure. This prevents any possibility of a girt buckling, as is often the case in other towers, and keeps the corner posts in line so they can not spring and give way.

Pump-Rod Guide. At every other girt in the No. 1, and every girt in the No. 2 tower, a swinging guide, as illustrated, is used to keep the pump-rod in line. This form of guide is simple and allows the rod to move up and down with practically no friction. It is adjustable making the alignment of rod an easy matter. Clamps connect guides to tower at one end and pump-rod at the other.

Straining Point. Every five feet in Ideal No. 1, and six feet in No. 2 Towers, is found a girt and two sets of wire braces arranged as shown in the cut. In the loop of the brace on the outside of the post is an eccentric washer for straining the braces. The eccentric has its bearing upon the bolt that holds the girt in place, which serves as an axis for the nut on the bolt holding the eccentric in position and keeping the braces tight.

Eccentric. The little cut shown with this description illustrates the Eccentric washer or straining device used for tightening the braces in constructing the Ideal Towers. One eccentric is furnished for each brace. It has its bearing on the bolt which holds the girt in place, which acts as an axle for it to rotate upon. A circular flange eccentric to the hole is upon one side, and this flange is placed inside the loop formed at end of brace. The square of eccentric is for wrench. By turning it according to directions the brace is made tight and all the parts of the tower are securely held in place.

Cast Anchor Plate

Steel Anchor Plate. The cut shown herewith is that of our Steel Anchor Plate, which is fastened securely to the bottom of the steel anchor post, and the whole planted securely at the desired depth in the ground. With the use of this steel anchor plate it is simply impossible for a tower to become insecure or blow over. The most severe windstorms have not been sufficient to affect our towers when thus securely anchored

We show here another form of anchor which we are using with great success. The cut shows the obvious advantages. The surface is large and the pattern is well designed and very strong. We make these in numerous sizes, from 12 to 22 inches in diameter, being somewhat governed by the height and weight of tower.

★ Samson Oil-Rite Windmills ★

SPREAD AT ANCHOR POST SPLICE OF 4-POST STOVER IDEAL REGULAR AND TAPER TANK TOWERS

4-Post, No. 1, 4 to 18 ft. Mills and Taper Tank Towers

Height of Tower	Spread
20 Foot	4 ft. 2 in.
30 Foot	6 ft. 2 in.
40 Foot	8 ft. 1 in.
50 Foot	10 ft. 1 in.
60 Foot	12 ft. 1 in.
70 Foot	14 ft. 1 in.
80 Foot	16 ft. 1 in.
90 Foot	18 ft. 1 in.
100 Foot	20 ft. 1 in.

4-Post, No. 2, 4 to 10 ft. Mills

Height of Tower	Spread
12 Foot	2 ft. 10 in.
18 Foot	4 ft. in.
24 Foot	5 ft. 2 in.
30 Foot	6 ft. 4 in.
36 Foot	7 ft. 7 in.
42 Foot	8 ft. 9 in.
48 Foot	9 ft. 11 in.
54 Foot	11 ft. 1 in.
60 Foot	12 ft. 4 in.
66 Foot	13 ft. 6 in.
72 Foot	14 ft. 9 in.
78 Foot	15 ft. 11 in.
84 Foot	17 ft. 1 in.

4-Post, for 20 ft. Mills only

Height of Tower	Spread
24 Foot	6 ft. 8 in.
36 Foot	9 ft. 8 in.
48 Foot	12 ft. 8 in.
60 Foot	15 ft. 7 in.
72 Foot	18 ft. 7 in.
84 Foot	21 ft. 7 in.

SPREAD AT ANCHOR POST SPLICE OF 4-POST STOVER IDEAL SPECIAL SPREAD TOWERS

4-Post, No. 2
4 to 10 ft.

Height of Tower	Spread
18 Foot	5 ft. in.
24 Foot	7 ft. in.
30 Foot	9 ft. in.
36 Foot	11 ft. 10 in.

4-Post, No. 1
4 to 18 ft.

Height of Tower	Spread
20 Foot	6 ft. 4 in.
30 Foot	10 ft. 5 in.
35 Foot	12 ft. 6½ in.
40 Foot	14 ft. 6½ in.

CLASS "A" SUBSTRUCTURE

Height of Tower	Spread Center to Center of Anchor Bolts when anchored on cement piers	Spread of Posts at Anchor Post Splice
12 Foot	7 ft. 0 in.	7 ft. 5 in.
24 Foot	9 ft. 0 in.	9 ft. 5 in.
36 Foot	11 ft. 0 in.	11 ft. 5 in.
48 Foot	13 ft. 0 in.	13 ft. 5 in.
60 Foot	15 ft. 0 in.	15 ft. 5 in.
72 Foot	17 ft. 0 in.	17 ft. 5 in.
84 Foot	19 ft. 0 in.	19 ft. 5 in.

CLASS "C" SUBSTRUCTURE

12 Foot	8 ft. 6 in.	8 ft. 11 in.
24 Foot	11 ft. 6 in.	11 ft. 11 in.
36 Foot	13 ft. 6 in.	13 ft. 11 in.
48 Foot	15 ft. 6 in.	15 ft. 11 in.
60 Foot	17 ft. 6 in.	17 ft. 11 in.
72 Foot	19 ft. 6 in.	19 ft. 11 in.
84 Foot	21 ft. 6 in.	21 ft. 11 in.

TEXAS TYPE SUBSTRUCTURE

6 Foot	3 ft. 8¼ in.	4 ft. 1½ in.
11 Foot	4 ft. 8½ in.	5 ft. 1 in.
16 Foot	5 ft. 8½ in.	6 ft. 1 in.
21 Foot	6 ft. 8¼ in.	7 ft. 1¼ in.

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities

6 FT. WINDMILL

Diam. of Cylinder	Wind Velocities per Hour: 6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
1¾	55 ft. 26 gal.				
2	42 ft. 34 gal.	56 ft. 46 gal.			
2¼	33 ft. 43 gal.	44 ft. 58 gal.	55 ft. 72 gal.		
2½	27 ft. 54 gal.	36 ft. 71 gal.	45 ft. 89 gal.	54 ft. 107 gal.	
2¾		30 ft. 86 gal.	37 ft. 108 gal.	44 ft. 130 gal.	55 ft. 162 gal.
3			31 ft. 129 gal.	37 ft. 154 gal.	47 ft. 193 gal.
3¼			26 ft. 151 gal.	32 ft. 181 gal.	40 ft. 226 gal.
3½				27 ft. 210 gal.	34 ft. 262 gal.

8 FT. WINDMILL

Diam. of Cylinder	Wind Velocities per Hour: 6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
1¾	108 ft. 41 gal.				
2	83 ft. 41 gal.	111 ft. 55 gal.			
2¼	65 ft. 52 gal.	87 ft. 69 gal.	109 ft. 87 gal.		
2½	53 ft. 64 gal.	71 ft. 86 gal.	89 ft. 107 gal.	106 ft. 129 gal.	
2¾	44 ft. 78 gal.	58 ft. 104 gal.	73 ft. 130 gal.	88 ft. 155 gal.	109 ft. 194 gal.
3	37 ft. 93 gal.	49 ft. 123 gal.	61 ft. 154 gal.	74 ft. 185 gal.	92 ft. 231 gal.
3¼	31 ft. 109 gal.	42 ft. 143 gal.	53 ft. 181 gal.	63 ft. 217 gal.	79 ft. 272 gal.
3½	27 ft. 126 gal.	36 ft. 168 gal.	45 ft. 210 gal.	54 ft. 252 gal.	68 ft. 316 gal.
3¾		31 ft. 193 gal.	39 ft. 241 gal.	47 ft. 289 gal.	59 ft. 362 gal.
4		28 ft. 219 gal.	35 ft. 274 gal.	41 ft. 329 gal.	52 ft. 411 gal.
4½		25 ft. 248 gal.	31 ft. 310 gal.	37 ft. 371 gal.	46 ft. 464 gal.
4½			27 ft. 347 gal.	33 ft. 416 gal.	41 ft. 521 gal.
4¾				29 ft. 464 gal.	37 ft. 580 gal.
5				27 ft. 514 gal.	33 ft. 642 gal.
5½					27 ft. 778 gal.

The capacities listed in the above tables are very conservative, therefore, the mills will readily deliver the amount of water specified under ordinary conditions.

★ Samson Oil-Rite Windmills ★

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by a

10 FT. WINDMILL

Diam. of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
1¾	212 ft. 31 gal.	282 ft. 41 gal.			
2	162 ft. 41 gal.	216 ft. 55 gal.	270 ft. 69 gal.		
2¼	128 ft. 52 gal.	171 ft. 69 gal.	213 ft. 87 gal.	256 ft. 104 gal.	
2½	104 ft. 64 gal.	138 ft. 86 gal.	173 ft. 107 gal.	207 ft. 129 gal.	259 ft. 161 gal.
2¾	86 ft. 78 gal.	114 ft. 104 gal.	143 ft. 130 gal.	171 ft. 155 gal.	214 ft. 194 gal.
3	72 ft. 93 gal.	96 ft. 123 gal.	120 ft. 154 gal.	144 ft. 185 gal.	180 ft. 231 gal.
3¼	61 ft. 109 gal.	82 ft. 145 gal.	102 ft. 181 gal.	123 ft. 217 gal.	153 ft. 272 gal.
3½	53 ft. 126 gal.	71 ft. 168 gal.	88 ft. 210 gal.	106 ft. 252 gal.	132 ft. 315 gal.
3¾	46 ft. 145 gal.	61 ft. 193 gal.	77 ft. 241 gal.	92 ft. 289 gal.	115 ft. 362 gal.
4	41 ft. 165 gal.	54 ft. 219 gal.	68 ft. 274 gal.	81 ft. 329 gal.	101 ft. 411 gal.
4¼	36 ft. 186 gal.	48 ft. 248 gal.	60 ft. 310 gal.	72 ft. 371 gal.	90 ft. 464 gal.
4½	32 ft. 208 gal.	43 ft. 277 gal.	53 ft. 347 gal.	64 ft. 416 gal.	80 ft. 521 gal.
4¾	29 ft. 232 gal.	37 ft. 309 gal.	48 ft. 387 gal.	57 ft. 464 gal.	72 ft. 580 gal.
5	26 ft. 257 gal.	35 ft. 343 gal.	43 ft. 428 gal.	52 ft. 514 gal.	65 ft. 643 gal.
5½		29 ft. 415 gal.	36 ft. 519 gal.	43 ft. 622 gal.	54 ft. 778 gal.
5¾		26 ft. 453 gal.	33 ft. 567 gal.	39 ft. 680 gal.	49 ft. 850 gal.
6			30 ft. 617 gal.	36 ft. 740 gal.	45 ft. 925 gal.
8					25 ft. 1645 gal.

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by a

12 FT. WINDMILL

Diam. of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
1¾	365 ft. 31 gal.				
2	280 ft. 41 gal.	373 ft. 55 gal.			
2¼	221 ft. 52 gal.	295 ft. 69 gal.	369 ft. 87 gal.		
2½	179 ft. 64 gal.	239 ft. 86 gal.	299 ft. 107 gal.	359 ft. 129 gal.	
2¾	148 ft. 78 gal.	197 ft. 104 gal.	247 ft. 130 gal.	296 ft. 155 gal.	370 ft. 194 gal.
3	124 ft. 93 gal.	166 ft. 123 gal.	208 ft. 154 gal.	249 ft. 185 gal.	311 ft. 231 gal.
3¼	106 ft. 109 gal.	141 ft. 145 gal.	177 ft. 181 gal.	212 ft. 217 gal.	265 ft. 272 gal.
3½	91 ft. 126 gal.	122 ft. 168 gal.	152 ft. 210 gal.	183 ft. 252 gal.	229 ft. 315 gal.
3¾	80 ft. 145 gal.	106 ft. 193 gal.	133 ft. 241 gal.	159 ft. 289 gal.	199 ft. 362 gal.
4	70 ft. 165 gal.	93 ft. 219 gal.	117 ft. 274 gal.	140 ft. 329 gal.	175 ft. 411 gal.
4¼	62 ft. 186 gal.	83 ft. 248 gal.	103 ft. 310 gal.	124 ft. 371 gal.	155 ft. 464 gal.
4½	55 ft. 208 gal.	74 ft. 277 gal.	92 ft. 347 gal.	110 ft. 416 gal.	138 ft. 521 gal.
4¾	50 ft. 232 gal.	66 ft. 309 gal.	83 ft. 387 gal.	100 ft. 464 gal.	125 ft. 580 gal.
5	45 ft. 257 gal.	60 ft. 343 gal.	75 ft. 428 gal.	90 ft. 514 gal.	112 ft. 643 gal.
5½	37 ft. 311 gal.	49 ft. 415 gal.	62 ft. 519 gal.	74 ft. 622 gal.	93 ft. 778 gal.
5¾	34 ft. 340 gal.	45 ft. 453 gal.	57 ft. 567 gal.	68 ft. 680 gal.	85 ft. 850 gal.
6	31 ft. 370 gal.	42 ft. 493 gal.	52 ft. 617 gal.	62 ft. 740 gal.	78 ft. 925 gal.
8			29 ft. 1097 gal.	35 ft. 1316 gal.	44 ft. 1645 gal.
10					28 ft. 2570 gal.

The capacities listed in the above tables are very conservative, therefore, the mills will readily deliver the amount of water specified under ordinary conditions.

★ Samson Oil-Rite Windmills ★

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by a

14 FT. SAMSON WINDMILL

Diam. of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
2	400 ft. 46 gal.				
2¼	316 ft. 58 gal.	422 ft. 77 gal.			
2½	256 ft. 71 gal.	342 ft. 95 gal.	427 ft. 119 gal.		
2¾	212 ft. 86 gal.	282 ft. 115 gal.	353 ft. 144 gal.	423 ft. 173 gal.	
3	178 ft. 103 gal.	237 ft. 137 gal.	297 ft. 171 gal.	356 ft. 206 gal.	445 ft. 257 gal.
3¼	152 ft. 121 gal.	202 ft. 161 gal.	253 ft. 201 gal.	303 ft. 241 gal.	379 ft. 302 gal.
3½	131 ft. 140 gal.	174 ft. 187 gal.	218 ft. 233 gal.	261 ft. 280 gal.	327 ft. 350 gal.
3¾	114 ft. 161 gal.	152 ft. 214 gal.	190 ft. 268 gal.	228 ft. 321 gal.	285 ft. 402 gal.
4	100 ft. 183 gal.	133 ft. 244 gal.	167 ft. 305 gal.	200 ft. 366 gal.	250 ft. 457 gal.
4¼	89 ft. 206 gal.	118 ft. 275 gal.	148 ft. 344 gal.	177 ft. 413 gal.	222 ft. 516 gal.
4½	79 ft. 231 gal.	105 ft. 308 gal.	132 ft. 386 gal.	158 ft. 463 gal.	198 ft. 578 gal.
4¾	71 ft. 258 gal.	95 ft. 344 gal.	118 ft. 430 gal.	142 ft. 516 gal.	177 ft. 644 gal.
5	64 ft. 286 gal.	85 ft. 381 gal.	107 ft. 476 gal.	128 ft. 571 gal.	160 ft. 714 gal.
5½	53 ft. 346 gal.	71 ft. 461 gal.	88 ft. 576 gal.	106 ft. 691 gal.	132 ft. 864 gal.
5¾	48 ft. 378 gal.	65 ft. 504 gal.	81 ft. 630 gal.	97 ft. 755 gal.	121 ft. 944 gal.
6	44 ft. 411 gal.	59 ft. 548 gal.	64 ft. 685 gal.	89 ft. 823 gal.	111 ft. 1028 gal.
8	25 ft. 731 gal.	33 ft. 975 gal.	42 ft. 1219 gal.	50 ft. 1462 gal.	63 ft. 1827 gal.
10			27 ft. 1904 gal.	32 ft. 2285 gal.	40 ft. 2856 gal.
2-8				25 ft. 2925 gal.	31 ft. 3656 gal.
1-12				22 ft. 3290 gal.	28 ft. 4113 gal.

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by a

16 FT. SAMSON WINDMILL

Diam. of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
2¼	472 ft. 58 gal.				
2½	382 ft. 71 gal.	510 ft. 95 gal.			
2¾	316 ft. 86 gal.	421 ft. 115 gal.	527 ft. 144 gal.		
3	266 ft. 103 gal.	354 ft. 137 gal.	443 ft. 171 gal.	531 ft. 206 gal.	
3¼	226 ft. 121 gal.	302 ft. 161 gal.	377 ft. 201 gal.	453 ft. 241 gal.	560 ft. 302 gal.
3½	195 ft. 140 gal.	260 ft. 187 gal.	325 ft. 233 gal.	390 ft. 280 gal.	487 ft. 350 gal.
3¾	170 ft. 161 gal.	227 ft. 214 gal.	283 ft. 268 gal.	340 ft. 321 gal.	425 ft. 402 gal.
4	149 ft. 183 gal.	199 ft. 244 gal.	249 ft. 305 gal.	299 ft. 366 gal.	373 ft. 457 gal.
4¼	132 ft. 206 gal.	176 ft. 275 gal.	221 ft. 344 gal.	265 ft. 413 gal.	331 ft. 516 gal.
4½	118 ft. 231 gal.	157 ft. 308 gal.	197 ft. 386 gal.	236 ft. 463 gal.	295 ft. 578 gal.
4¾	106 ft. 258 gal.	141 ft. 344 gal.	177 ft. 430 gal.	212 ft. 516 gal.	265 ft. 644 gal.
5	96 ft. 286 gal.	127 ft. 381 gal.	159 ft. 476 gal.	191 ft. 571 gal.	239 ft. 714 gal.
5½	79 ft. 346 gal.	105 ft. 461 gal.	132 ft. 576 gal.	158 ft. 691 gal.	198 ft. 864 gal.
5¾	72 ft. 378 gal.	96 ft. 504 gal.	121 ft. 630 gal.	145 ft. 755 gal.	181 ft. 944 gal.
6	66 ft. 411 gal.	89 ft. 548 gal.	111 ft. 685 gal.	133 ft. 823 gal.	166 ft. 1028 gal.
8	37 ft. 731 gal.	50 ft. 975 gal.	62 ft. 1219 gal	75 ft. 1462 gal.	93 ft. 1827 gal.
10		32 ft. 1523 gal.	40 ft. 1904 gal.	48 ft. 2285 gal.	60 ft. 2856 gal.
2-8		25 ft. 1950 gal.	31 ft. 2437 gal.	37 ft. 2925 gal.	47 ft. 3656 gal.
1-12			28 ft. 2742 gal.	33 ft. 3290 gal.	42 ft. 4113 gal.
2-10			20 ft. 3808 gal.	24 ft. 4570 gal.	30 ft. 5712 gal.
1-10 1-12					25 ft. 6069 gal.

The capacities listed in the above tables are very conservative, therefore, the mills will readily deliver the amount of water specified under ordinary conditions.

★ Samson Oil-Rite Windmills ★

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by an

18 FT. SAMSON WINDMILL

Diam of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
2½	454 ft. 86 gal.				
2¾	375 ft. 104 gal.	500 ft. 138 gal.			
3	315 ft. 123 gal.	420 ft. 165 gal.	525 ft. 206 gal.		
3¼	269 ft. 145 gal.	358 ft. 193 gal.	448 ft. 241 gal.	537 ft. 290 gal.	
3½	231 ft. 168 gal.	309 ft. 224 gal.	386 ft. 280 gal.	463 ft. 336 gal.	
3¾	202 ft. 193 gal.	269 ft. 257 gal.	336 ft. 321 gal.	403 ft. 386 gal.	504 ft. 482 gal.
4	177 ft. 219 gal.	236 ft. 292 gal.	295 ft. 366 gal.	355 ft. 439 gal.	443 ft. 548 gal.
4¼	157 ft. 248 gal.	209 ft. 330 gal.	262 ft. 413 gal.	314 ft. 495 gal.	393 ft. 619 gal.
4½	140 ft. 278 gal.	187 ft. 370 gal.	235 ft. 463 gal.	280 ft. 555 gal.	350 ft. 694 gal.
4¾	126 ft. 309 gal.	168 ft. 412 gal.	210 ft. 516 gal.	251 ft. 619 gal.	314 ft. 773 gal.
5	113 ft. 343 gal.	151 ft. 457 gal.	189 ft. 571 gal.	227 ft. 685 gal.	284 ft. 857 gal.
5½	93 ft. 415 gal.	125 ft. 553 gal.	156 ft. 691 gal.	187 ft. 829 gal.	234 ft. 1037 gal.
5¾	86 ft. 453 gal.	114 ft. 604 gal.	143 ft. 755 gal.	172 ft. 906 gal.	214 ft. 1133 gal.
6	79 ft. 494 gal.	105 ft. 658 gal.	131 ft. 823 gal.	158 ft. 987 gal.	197 ft. 1234 gal.
8	44 ft. 877 gal.	59 ft. 1170 gal.	74 ft. 1462 gal.	89 ft. 1755 gal.	111 ft. 2193 gal.
10	28 ft. 1371 gal.	38 ft. 1828 gal.	47 ft. 2285 gal.	57 ft. 2742 gal.	71 ft. 3427 gal.
2-8		30 ft. 2340 gal.	36 ft. 2925 gal.	44 ft. 3510 gal.	55 ft. 4387 gal.
1-12		26 ft. 2632 gal.	34 ft. 3290 gal.	39 ft. 3948 gal.	49 ft. 4935 gal.
2-10			24 ft. 4570 gal.	28 ft. 5484 gal.	35 ft. 6854 gal.
1-10 1-12				23 ft. 6090 gal.	29 ft. 8362 gal.
2-12					25 ft. 9870 gal.

Table Showing Gallons Per Hour and Total Elevation that Water can be Raised with Different Sized Pump Cylinders with Different Wind Velocities by a

20 FT. SAMSON WINDMILL

Diam. of Cylinder	Wind Velocities Per Hour				
	6 Miles	8 Miles	10 Miles	12 Miles	15 Miles
2½	498 ft. 107 gal.				
2¾	412 ft. 130 gal.	549 ft. 173 gal.			
3	346 ft. 154 gal.	461 ft. 205 gal.	576 ft. 257 gal.		
3¼	295 ft. 181 gal.	393 ft. 241 gal.	491 ft. 302 gal.	590 ft. 362 gal.	
3½	254 ft. 210 gal.	339 ft. 280 gal.	423 ft. 350 gal.	508 ft. 420 gal.	
3¾	221 ft. 241 gal.	295 ft. 321 gal.	368 ft. 402 gal.	442 ft. 482 gal.	552 ft. 602 gal.
4	195 ft. 274 gal.	259 ft. 366 gal.	321 ft. 457 gal.	389 ft. 548 gal.	486 ft. 685 gal.
4¼	172 ft. 310 gal.	230 ft. 413 gal.	287 ft. 516 gal.	345 ft. 619 gal.	431 ft. 774 gal.
4½	154 ft. 347 gal.	205 ft. 463 gal.	256 ft. 578 gal.	307 ft. 694 gal.	381 ft. 868 gal.
4¾	138 ft. 387 gal.	184 ft. 516 gal.	230 ft. 644 gal.	276 ft. 773 gal.	345 ft. 967 gal.
5	124 ft. 428 gal.	166 ft. 571 gal.	208 ft. 714 gal.	249 ft. 857 gal.	311 ft. 1071 gal.
5½	103 ft. 518 gal.	137 ft. 691 gal.	171 ft. 864 gal.	206 ft. 1037 gal.	257 ft. 1296 gal.
5¾	91 ft. 567 gal.	126 ft. 755 gal.	157 ft. 944 gal.	188 ft. 1133 gal.	235 ft. 1416 gal.
6	86 ft. 617 gal.	115 ft. 823 gal.	144 ft. 1028 gal.	173 ft. 1234 gal.	216 ft. 1542 gal.
8	49 ft. 1097 gal.	65 ft. 1462 gal.	81 ft. 1828 gal.	97 ft. 2194 gal.	122 ft. 2742 gal.
10	31 ft. 1714 gal.	42 ft. 2285 gal.	52 ft. 2856 gal.	62 ft. 3427 gal.	78 ft. 4284 gal.
2-8	24 ft. 2193 gal.	33 ft. 2925 gal.	41 ft. 3656 gal.	49 ft. 4387 gal.	61 ft. 5484 gal.
1-12		29 ft. 3290 gal.	36 ft. 4113 gal.	43 ft. 4935 gal.	54 ft. 6169 gal.
2-10			26 ft. 5712 gal.	31 ft. 6854 gal.	39 ft. 8568 gal.
1-10 1-12				26 ft. 8362 gal.	32 ft. 10453 gal.
2-12				22 ft. 9870 gal.	27 ft. 12338 gal.
3-10				20 ft. 10282 gal.	26 ft. 12852 gal.

The capacities listed in the above tables are very conservative, therefore, the mills will readily deliver the amount of water specified under ordinary conditions.

⋆ Samson Oil-Rite Windmills ⋆

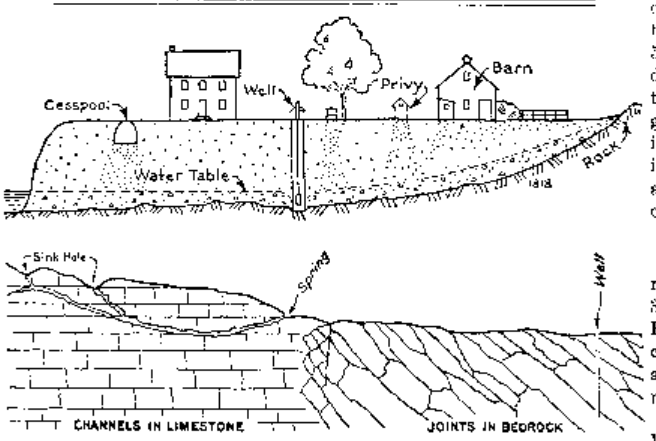
Excerpts from U.S. Department of Agriculture Bulletin No. 1448 Entitled "Farmstead Water Systems"

INTRODUCTION

Farm women say their greatest need is to have water piped into a house, especially to the kitchen sink. To draw water by turning a faucet does wonders to lighten the work and revive the spirits of the housewife. Farm men find running water no less convenient. No other utility is so often used. If the water is pure, no other utility does so much to promote the health of both man and stock.

PURITY OF FARM WATERS

Purity of the water supply should be the first consideration of the farmer, though the fact is seldom realized until sickness or death visits some loved one. Disease germs can not be seen with the naked eye and thousands may lurk in a drop of water or in a particle of waste matter the size of a pinhead. From specific germs or parasites that may at any time exist in contaminated water there may result typhoid fever, dysentery, diarrhea, or intestinal worms, of which the hookworm, roundworm, whipworm, eelworm, tapeworm, and seatworm are the more common. Contaminated water may contain also the causative agents of numerous ailments common to livestock, such as tuberculosis, hog cholera, anthrax, glanders, and stomach and intestinal worms. Disease germs are carried by many agencies and are unsuspectingly received into the body.



How Foul Drainage Reaches Wells and Streams

Below: Characteristic openings in rock formations; sink holes and channels dissolved in limestone; jointed or broken condition in the upper portion of granite and other kinds of bedrock; the farm wastes should never be thrown or discharged in sink holes or other rock openings.

Surveys indicate that three out of four farm water supplies are sufficiently polluted to be unsafe. Streams, ponds, irrigation ditches, and other surface supplies are sure to receive pollution, either directly or from surface wash. Wells and springs are polluted through the open or loose top and by foul drainage underground.

CHARACTERISTICS OF GOOD WATER

Water for domestic use should be clear, colorless, odorless, soft, neither strongly acid nor alkaline, and its temperature for general farm purposes should be about 50° F. These characteristics, however, must never be deemed proof of purity, for a glass of water may possess them all and yet contain millions of disease-producing germs. Any suspicious water should be rejected or disinfected until both the water and the surroundings where it is obtained are passed upon by competent sanitation authority, such as the town, city, county, or state board of health.

CONSUMPTION OF WATER

Higher standards of living are everywhere creating new and increased demands for water. A bath requires 30 gallons, and each flush of a toilet takes 4 to 6 gallons. Heavily worked horses and mules and milk cows may consume 20 to 25 gallons per day in hot weather, and with all farm animals conditions of weather, food, and living may double or halve the ordinary requirements.

Hand power is unsuited to large supplies or high lifts. Windmills are more extensively used for pumping water than any other source of power, and if well installed and maintained give good low-cost service. In selecting an outfit, the prevailing wind velocity, the size of the wheel, the diameter of the cylinder, and the lift should be considered to avoid overloading. Windmills are generally loaded in the Middle West to operate in 15-mile winds, starting to pump in a 6 to 8-mile wind, doing excellent work in a 15-

mile wind, and reaching the maximum in a 25 to 30-mile wind. In mountainous regions windmills are generally loaded for a 10-mile wind. With the exception of Kansas and a few other states the most desirable wind velocities for pumping rarely prevail as much as one-third of the time. The most common cause of overloading comes from using a cylinder excessively large in diameter. The longer periods of operation by small cylinders as compared to large cylinders, enables the former, in the course of a season or year, to pump more water. Cylinders and mills which have long, slow strokes are recommended. Recommendations and claims as interpolated from the catalogs of different manufacturers of back-geared windmills are given in Table 9.

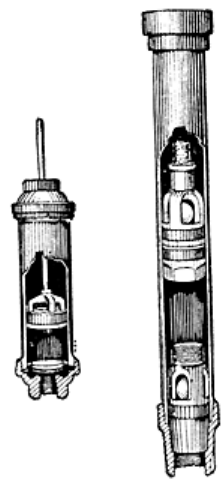
Horsepower required to pump water (based on overall efficiency of 25 per cent).

Gallons per minute	Lift in Feet									
	50	60	70	80	90	100	125	150	175	200
	Horsepower Required									
2	0.10	0.12	0.14	0.16	0.18	0.20	0.25	0.30	0.35	0.40
3	.15	.18	.21	.24	.27	.30	.38	.45	.53	.60
4	.20	.24	.28	.32	.36	.40	.50	.60	.70	.80
5	.25	.30	.35	.40	.45	.50	.63	.75	.88	1.00
6	.30	.36	.42	.48	.54	.60	.75	.90	1.05	1.20
7	.35	.42	.49	.56	.63	.70	.88	1.05	1.23	1.40
8	.40	.48	.56	.64	.72	.80	1.00	1.20	1.40	1.60
9	.45	.54	.63	.72	.81	.90	1.13	1.35	1.58	1.80
10	.50	.60	.70	.80	.90	1.00	1.25	1.50	1.75	2.00

LOCATION AND STYLE OF CYLINDER

Submergence is best because it keeps the cylinder primed and the pump leathers pliable. Deep-well pumps are usually single-acting; that is, water is lifted on the up stroke.

It is a great convenience, especially in wells 75 or more feet in depth, to use an open-type cylinder fitted for drop pipe one size larger, to facilitate pulling up the lower plunger for renewal of leathers or other parts. A closed-type cylinder with smaller drop pipe requires drawing cylinder, pump rod, and drop pipe. The two types of cylinder are shown herewith. The size of the cylinder should always be determined from the size, depth, and yielding power of the well, the hours within which the daily requirements are to be pumped, and the available power. Ordinarily the day's pumping is done in one to three hours. Deep wells and hand and windmill outfits take the smaller cylinders; the advice of a reliable dealer or manufacturer whose product is to be used should always be obtained.



Pump Cylinders

STORAGE OF WATER

Elevated Tanks

Water may be stored in wood, steel, or masonry tanks, and to secure gravity delivery the tank must be elevated above all faucets. Tanks placed in attics, barn lofts, and upon light trestles are unsatisfactory. The objections relate to insecurity and leakage, lack of pressure, and unwholesomeness in summer and freezing in winter. Masonry tanks may be placed on a hill, silo, or masonry tower. Where possible, an underground concrete tank on a hill is very desirable, avoiding trouble with frost and giving a tempered and sure supply. Tanks should hold more than one day's supply. For windmill supplies the requirements of a week or more may be needed at times. Tanks should be provided with a waste pipe and valve to facilitate emptying and cleaning, and without fail should be covered tightly for protection against heat, cold, dust, vermin, and sunlight. Where exposed to light, ground and filtered waters are liable to develop growths which impart objectionable odor, taste, or appearance.

Hydropneumatic Tanks

Water may be stored and delivered to the faucet by the use of a hydropneumatic (water-air) tank. The tank need not be elevated and usually is conveniently located in a utility room, basement, or cellar. Hydropneumatic tanks must be absolutely air-tight. Air being lighter than water occupies the upper portion of the tank, and it presses with increasing force against the water as either more water or more air is pumped into the tank. When air and water are under pressure the latter gradually absorbs the former, and this absorption is the more rapid the higher the pressure. From time to time, therefore, the air supply must be replenished, or the tank becomes water-logged. Maintenance of the air supply is a vital factor. Inlet and outlet pipes must enter at the bottom of the tank. Hydropneumatic tanks are made of three-sixteenths inch or thicker steel with riveted and welded or calked joints.

★ Samson Oil-Rite Windmills ★

PLANNING A SYSTEM

Sufficient information has been given to enable the farmer to outline his plans. An example will be helpful. Suppose a plant is desired to meet the needs of 5 persons, 25 cattle (including horses or mules), 50 sheep, and 50 hogs. The average daily requirements would be as follows:

	Gallons
5 persons at 40 gallons each	200
25 cattle at 12 gallons each	300
50 sheep at 1 gallon each	50
50 hogs at 1 gallon each	50
Total	600

If electric current costs 15 cents per kilowatt hour the cost of pumping 600 gallons would approximate 14 cents per day.

Table 9

Approximate capacity of windmills
(from manufacturers' ratings)

Lift	Velocity of wind per hour	Diameter of Wheel: 6 feet		8 feet		10 feet		12 feet	
		Diameter of cylinder	Capacity per hour	Diameter of cylinder	Capacity per hour	Diameter of cylinder	Capacity per hour	Diameter of cylinder	Capacity per hour
Feet	Miles	Inches	Gals.	Inches	Gals.	Inches	Gals.	Inches	Gals.
25	10	2½	140	3½	320	4¼	420	5½	1,010
35	10	2	120	3	270	4	360	5	675
50	10	1¾	110	2¾	180	3½	305	4	520
75	10	.....	.....	2½	135	3	235	3	365
100	10	.....	.....	2	105	2½	160	2¾	265
125	10	.....	.....	1¾	90	2	125	2½	200
25	15	3½	250	5	560	7	1,190	9	2,190
35	15	3	175	4	400	6	880	7	1,595
50	15	2½	125	3½	280	5	610	6	1,165
75	15	2	85	2¾	190	4	375	5	760
100	15	1⅞	60	2½	140	3½	305	4½	565
125	15	.....	.....	2¼	115	3¼	250	3¾	450

To find the capacity of square or rectangular cisterns and tanks: Multiply the inside length by the breadth and the product by the height, each dimension being in feet. Multiply the result (cubic feet) by 7½ to find the gallons. Gallons divided by 31½ give barrels. Table 2 shows the capacity of round cisterns of certain dimensions.

Table 2
Capacity of Round Cisterns and Tanks

Depth in Feet	Diameter in Feet: 4	5	6	7	8	9	10	11	12
	Capacity in Gallons								
4	376	588	846	1,152	1,504	1,904	2,350	2,844	3,384
5	470	735	1,058	1,439	1,880	2,380	2,938	3,555	4,230
6	564	881	1,269	1,727	2,256	2,855	3,525	4,265	5,076
7	658	1,028	1,481	2,015	2,632	3,331	4,113	4,976	5,922
8	752	1,175	1,692	2,303	3,008	3,807	4,700	5,687	6,768
9	846	1,322	1,904	2,591	3,384	4,283	5,288	6,398	7,614
10	940	1,469	2,115	2,879	3,760	4,759	5,875	7,109	8,460
11	1,034	1,616	2,327	3,167	4,123	5,235	6,463	7,820	9,306
12	1,128	1,763	2,537	3,455	4,512	5,711	7,050	8,531	10,152

Yearbook Separate 824, Securing a Dry Cellar, Farmers' Bulletin 1279, Plain Concrete for Farm Use, and Department Bulletin 230, Oil-Mixed Portland Cement Concrete. The first two are mailed free on request by the U. S. Department of Agriculture and the last may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. Also Bulletin 1448, Farmstead Water Supply.

A Large SAMSON in Service

★ Samson Oil-Rite Windmills ★

POWER OF WINDMILLS

The velocity of the wind determines its pressure, and the pressure of the wind against the sails of the windmill determines the power developed by the mill. A mill of small diameter acted upon by a high pressure develops as much power as a large mill working under a lower pressure.

AVERAGE HOURLY VELOCITY OF THE WIND AT FOLLOWING STATIONS OF THE U. S. WEATHER BUREAU GIVEN IN MILES PER HOUR

Albany, N. Y.	7
Alpena, Mich.	9
Amarillo, Texas	11
Atlanta, Ga.	9
Atlantic City, N. J.	10.3
Augusta, Ga.	4.2
Baltimore, Md.	6
Bismarck, N. D.	9.4
Boise City, Idaho	4.2
Boston, Mass.	10.2
Brownsville, Texas	7.4
Buffalo, N. Y.	10
Cairo, Ill.	7.6
Cape Henry, Va.	12.7
Charleston, S. C.	8
Charlotte, N. C.	5.6
Chattanooga, Tenn.	5.5
Cheyenne, Wyo.	10.5
Chicago, Ill.	10.5
Cincinnati, Ohio	6.3
Cleveland, Ohio	9.6
Columbus, Ohio	7.6
Davenport, Iowa	8.5
Denver, Colo.	6.7
DesMoines, Iowa	7
Detroit, Mich.	8.7
Dodge City, Kan.	11.8
Duluth, Minn.	7
Eastport, Me.	9.6
El Paso, Texas	6.3
Fort Grant, Ariz.	7
Fort Sill, I. T.	10.7
Galveston, Texas	10.3
Grand Haven, Mich.	10.7
Hatteras, N. C.	14
Havre, Mont.	8
Helena, Mont.	6.7
Huron, S. D.	11
Indianapolis, Ind.	6
Jacksonville, Fla.	6.7
Kansas City, Mo.	8.5
Keokuk, Iowa	8
Key West, Fla.	9.8
LaCrosse, Wis.	7.3
Leavenworth, Kan.	7.1
Little Rock, Ark.	5.6
Los Angeles, Cal.	4.7
Louisville, Ky.	7.3
Lynchburg, Va.	4
Madison, Wis.	10.2
Marquette, Mich.	8.7
Memphis, Tenn.	5.8
Mobile, Ala.	6.7
Montgomery, Ala.	5.1
New Haven, Conn.	8
New Orleans, La.	7.6
North Platte, Neb.	10.3
New York City	8
Olympia, Wash.	3.3
Omaha, Neb.	8.5
Oswego, N. Y.	9.6
Pensacola, Fla.	8.2
Philadelphia, Pa.	10
Pittsburg, Pa.	6
Portland, Me.	8
Portland, Ore.	5.3
Prescott, Ariz.	6.5
Red Bluff, Cal.	7
Roseburg, Ore.	5.3
Sacramento, Cal.	6.7
St. Louis, Mo.	10.3
St. Paul, Minn.	7.6
St. Vincent, Minn.	9.4
Salt Lake City, Utah	5.3
Sandy Hook, N. J.	14.5
San Diego, Cal.	5.6
San Francisco, Cal.	9.4
Santa Fe, N. M.	7
Savannah, Ga.	7
Shreveport, La.	5.6
Spokane Falls, Wash.	4.7
Springfield, Ill.	8.7
Vicksburg, Miss.	5.8
Washington, D. C.	6.5
Yuma, Ariz.	6
Yankton, S. D.	9

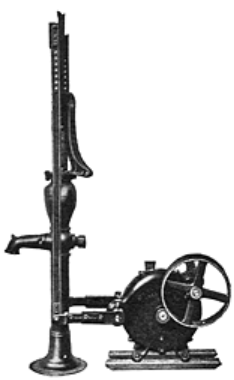
★ Samson Oil-Rite Windmills ★

Maximum Capacities of SAMSON "Oil-Rite" Windmills Pumping Water Various Total Elevations
SAMSON "Oil-Rite" Windmills Run Maximum Number of Strokes in About 20 Mile Winds

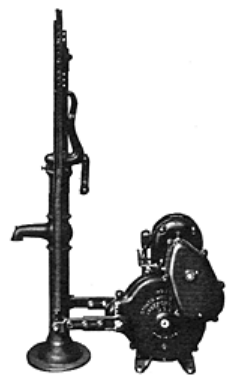
	6 Foot Maximum Stroke 6 In.		8 Foot Maximum Stroke 8 In.		10 Foot Maximum Stroke 10 In.		12 Foot Maximum Stroke 12 In.		14 Foot Maximum Stroke 14 In.		16 Foot Maximum Stroke 16 In.		18 Foot Maximum Stroke 16 In.		20 Foot Maximum Stroke 20 In.	
Total Elev. Feet	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour	Dia. Cyl. In.	Gals. Per Hour
20	3	400	4	1050	4½	1475	7	3850	8	5100	10	6550	12	8500	14	12000
30	3	400	3½	800	4	1100	6	2300	7	3500	10	6500	12	8000	14	11500
40	2½	275	3¼	775	4	1100	5	1550	6	2400	8	3900	10	6500	12	9000
50	2½	250	3	650	3	650	4½	1325	5	1800	7	3250	10	6000	12	8500
75	2	175	2½	400	2½	450	4	1090	4½	1450	6	2325	8	3700	10	6200
100			2	275	2¼	375	3	600	4	1150	5	1650	7	3100	8	4000
125			2	250	2¼	350	3	625	3¼	750	4¾	1475	5¾	2200	7	3000
150			1¾	200	1⅞	250	2¾	495	3¼	750	4¾	1450	4¾	1350	6	2200
200					1¾	200	2¼	330	2¾	550	4¼	1175	4¾	1300	5¾	2000
300							1¾	200	2¼	350	3¾	900	4¼	1000	4¾	1400
400									1¾	225	3¼	675	3¾	850	4¼	1100
500											2¾	500	3¼	600	3¾	875
600											2¼	375	2¾	475	3¼	650
700											1⅞	225	2¼	350	3¼	625
800													1⅞	200	2¾	475
900													1¾	175	2¾	450
1000															2¼	400
1100															1⅞	300
1200															1¾	200

Maximum number of strokes per minute for Samson Mills—6 and 8 ft., 38 to 40; 10 ft., 33 to 36; 12 ft., 20 to 32; 14 ft., 24 to 28; 16 ft., 18 to 22; 18 ft., 17 to 20; 20 ft., 12 to 16.

See tables on previous pages for more detailed information. Never use smaller discharge pipe than is recommended by cylinder manufacturer. We consider tubular well equipment best for deep wells.



A complete line of Pump Jacks in both open and enclosed type

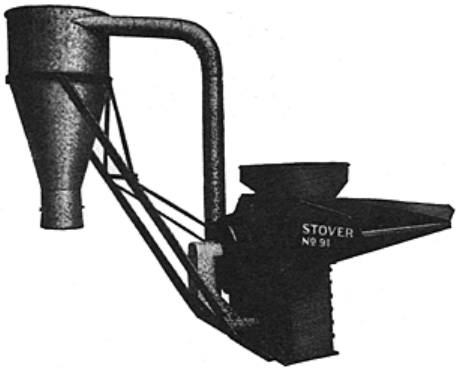


Direct Connected Motor Driven Pump Jack. Can also be furnished for belt drive.

No. 7 Siphon Stock Fountain Can also furnish Gravity Feed Type

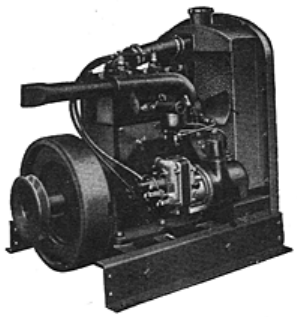
We will gladly furnish descriptive bulletins upon any of the above products to any one interested, if only requested.

STOVER MFG. & ENGINE CO., FREEPORT, ILLINOIS

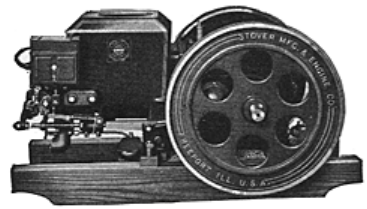


STOVER HAMMER MILLS
Manufactured in Five Sizes

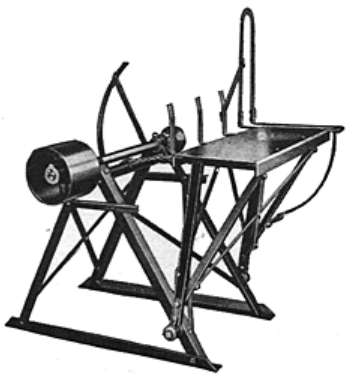
STOVER Cylinder Corn Shellers
Manufactured in Three Styles
A practical Sheller for the Individual



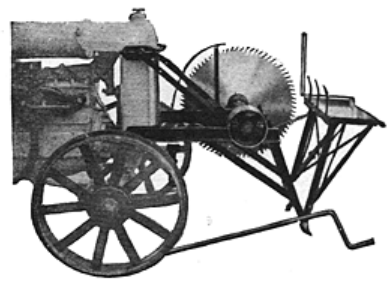
STOVER VERTICAL ENGINES
¾ to 22 H. P. Single, Double, 4-Cylinder
Air, Radiator, Hopper Cooled



STOVER GOOD ENGINES
1½ to 15 H. P. for Gasoline or Kerosene



Stover Stationary Saw Frames, Steel Constructed
For Cord and Pole Wood



Stover Front End Tractor Saw Frames
For Fourteen Popular Tractors

We will gladly furnish descriptive bulletins upon any of the above products to any one interested, if only requested.