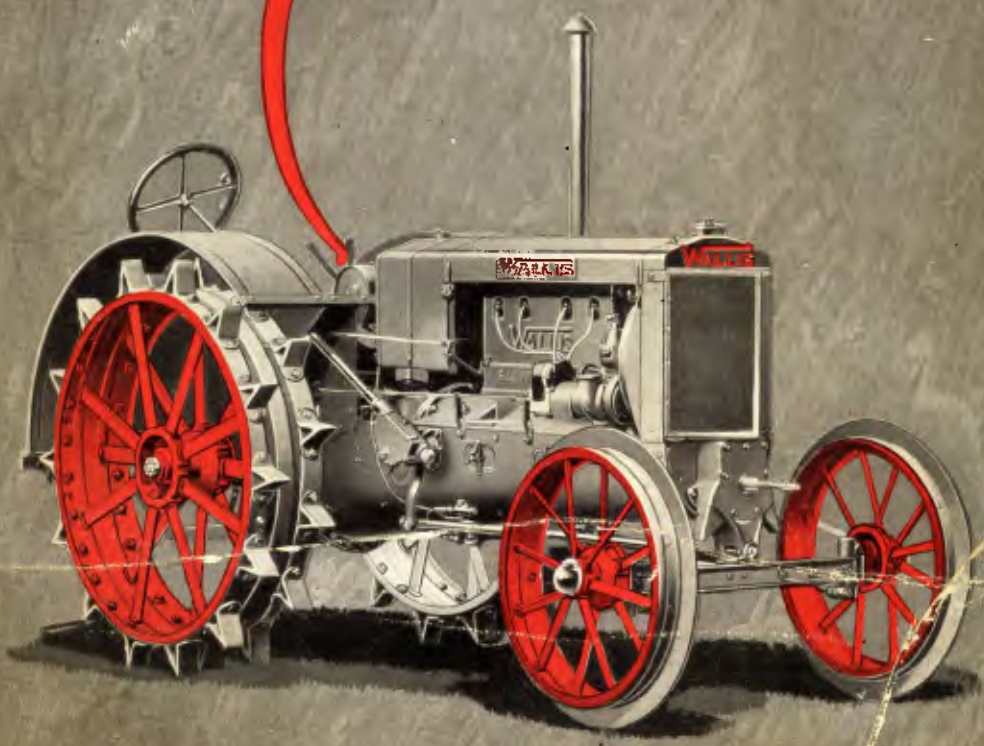
MASSEY-HARRIS

WALLIS

Certified

20-30 TRACTOR



History of the WALLIS

IN the year 1902, realizing the advantages of the 4 cylinder, fast moving tractor over the heavy, slow, steam or single cylinder type, a tractor was built, later to be known as the WALLIS BEAR—it pulled ten fourteen-inch plows.

After a few years' work in the field with the Bear, Wallis Engineers could see the coming demand for a lighter weight enclosed 4 cylinder tractor.

In 1912 the WALLIS CUB was built, weighing 8350 lbs. and pulled four to six plows. It was on this model that the first WALLIS—*Patented Boiler Plate U-Shaped Combination Frame and Crank Case* was first used.

Little did the Industry realize, at that time, that from this Tractor would come the basic design which would give to it the light weight, thoroughly enclosed tractor recognized as

"America's Foremost Tractor" The WALLIS

By 1915 Wallis Engineers were convinced that the majority of the farmers would demand a farm tractor of the four cylinder, enclosed gear type, weighing about 4,000 lbs. and to pull three plows. With the famous Wallis Patented Boiler Plate U-Shaped Frame as a base, the life of the present day Wallis began and was known as the Wallis Cub Junior or Model J—of the three wheel type. It met the requirement—in an industry which was new, refinements were a natural result. So in harmony with the recommendation of Wallis Owners the Cub Junior was converted to a four wheel type known as the Model K. Progress in the field of experience developed the Model OK, which became

"The Measuring Stick of the Tractor Industry"

Having reached the point where throughout 11 years of continuous economical performance the Wallis has proved itself Supreme, we turn to our President's statement in 1927—

"Our job is to continue keeping the Wallis Supreme . . ." with the result, we offer with pride and confidence as detailed in the following pages—

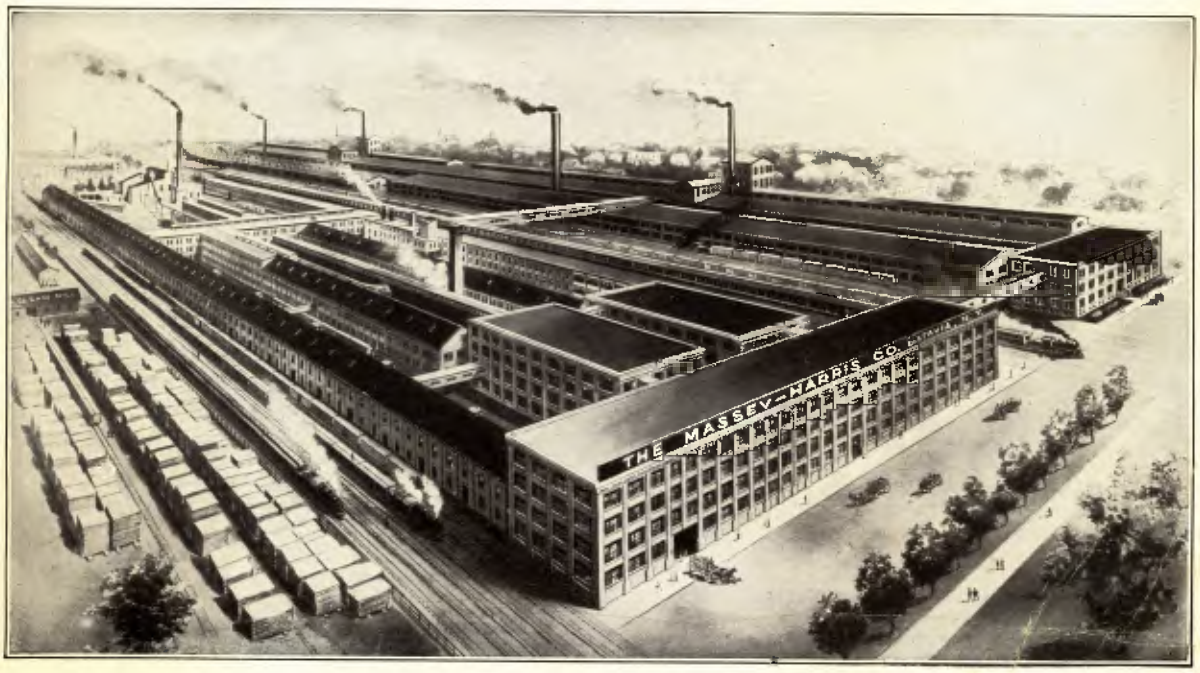
WALLIS Certified
20-30 TRACTOR

WALLIS

Certified

America's Foremost Tractor

The Massey-Harris, Racine, Wisconsin, Factory



The Massey-Harris, Batavia, New York, Factory

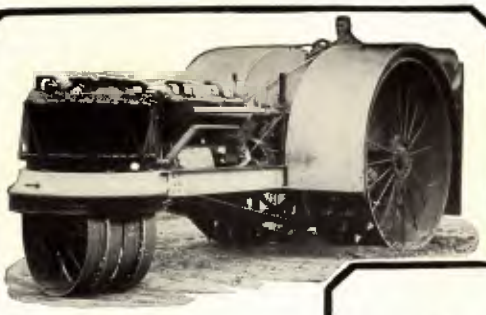
THE MASSEY-HARRIS COMPANY

Incorporated

General Offices: RACINE, WISCONSIN

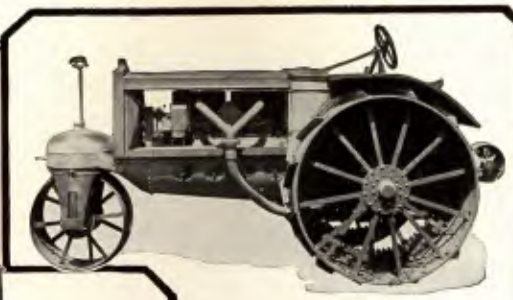
Factories at Racine, Wisconsin—Batavia, New York

Branch Houses and Distribution at Leading Trade Centers

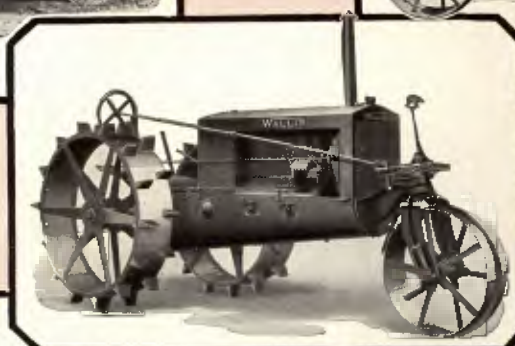


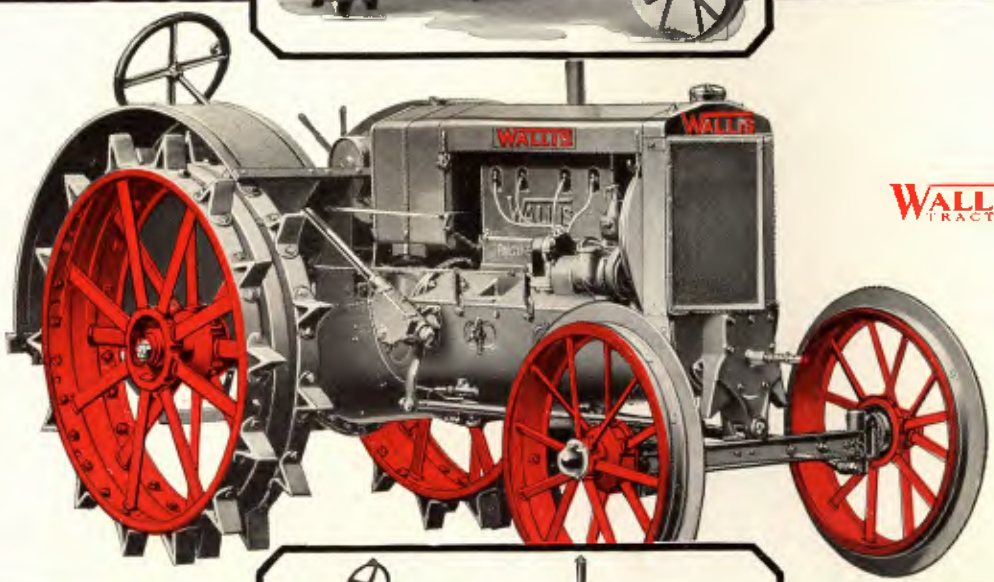
1902—"Bear"

1915
"Model J"



1912 "Cub"

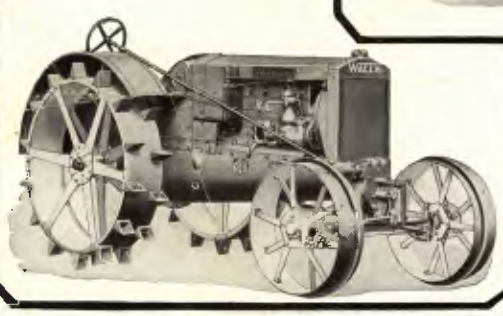




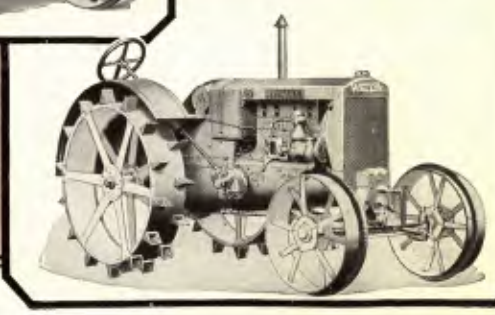
WALLIS Certified TRACTORS

1922 "Model OK"

1927-28 "Certified"



1919
"Model K"



Certified

Certificate

Wallis Tractor No. 99,000

I hereby certify that every engineering detail on this Wallis Tractor has been thoroughly tested and that every part is made of the best material for the purpose based on my twelve years' experience engineering Wallis Tractors.

Wallis Chief Engineer

I hereby certify that this Wallis Tractor has been carefully manufactured and meets every detail of the engineer's specifications, in material, precision and assembly.

Wallis Factory Superintendent

I hereby certify that every part used in this Wallis Tractor has been inspected and conforms to the rigid requirements of the management.

Wallis Chief Inspector

I hereby certify that this Wallis Tractor has been fully inspected and satisfactorily passed a five hour motor and transmission running test, and is now capable of giving many years of dependable, economical service.

Chief of Final Inspection

Based upon my belief that tractor users are chiefly interested in "More Acres per Hour" for "MORE YEARS" and at the "lowest upkeep cost," I have instructed that "THE CERTIFIED" Wallis Tractors be engineered, manufactured, inspected and tested to meet the high ideals of the thousands of Wallis users, and based on the above assurances of my associates, our Company cheerfully offers it, believing it will make the purchaser more prosperous and happy.

President

The conference which created the Wallis "Certified"

Cer'ti-fy—to give certain knowledge of, make evident, vouch for the truth of, attest.

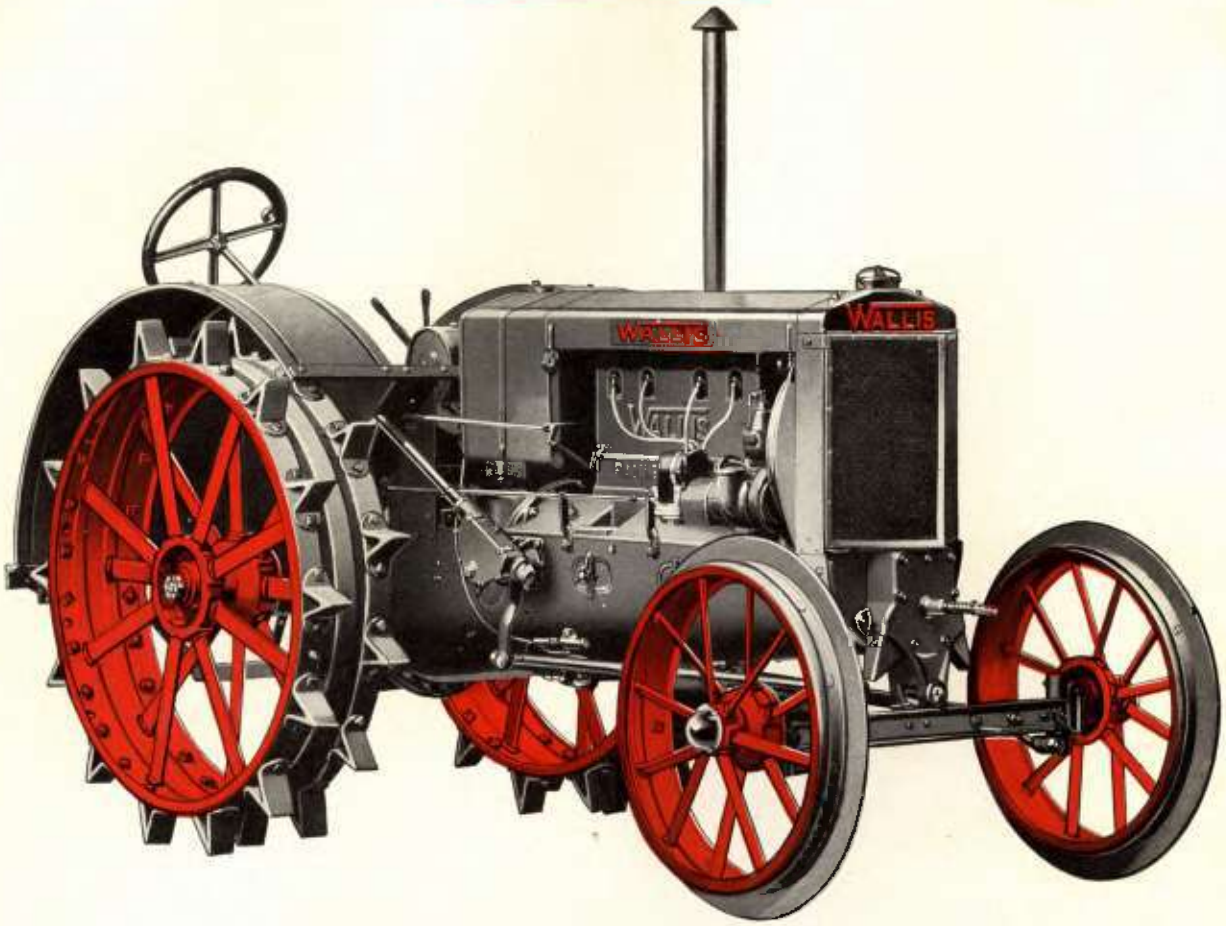
A "Certificate" signed by the men responsible for the High Quality Standard, which has made possible the remarkable Performance—Long Life and Economical Operation of the Wallis Tractor, is attached to each tractor just before shipment.

The "Certificate" is a personal assurance from the men who build to the men who purchase the Wallis that from the raw material to the shipping platform Wallis Tractor Construction has been thorough.

Each Wallis "Certified" Tractor receives 100% Inspection under the strict observation of high-grade mechanics, who are thoroughly trained and equipped with accurate gauges and the finest calibrating tool equipment for this purpose.

Close working limits are established by the Engineering Department and maintained by the Inspection Department who "Certify" to the correctness of each individual part.

WALLIS

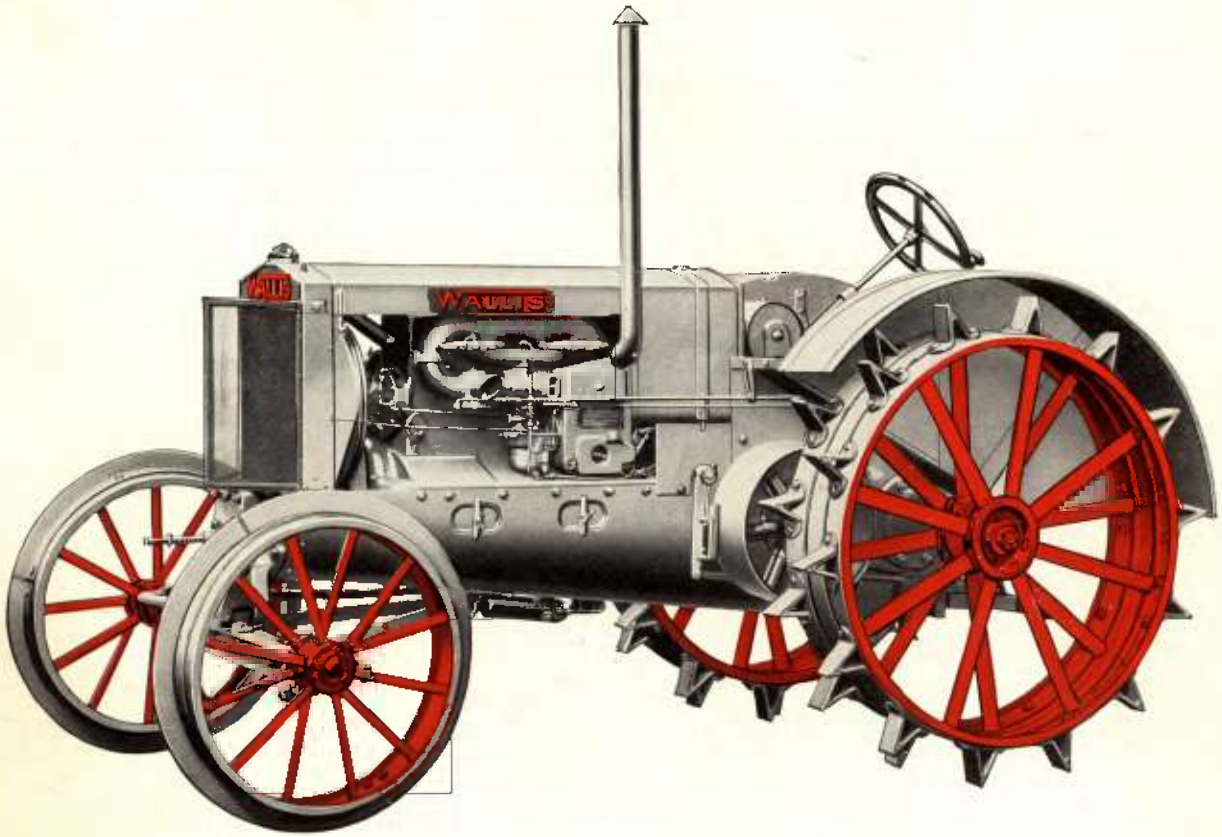


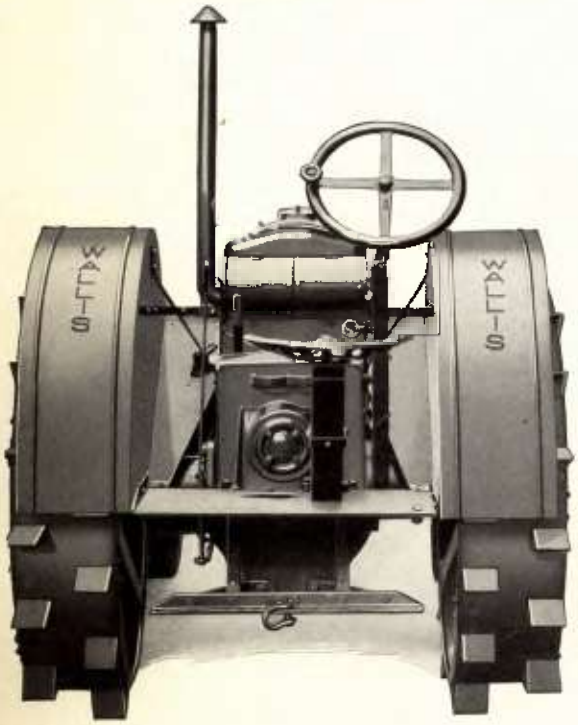
WALLIS 20-30 TRACTOR

Certified

Speed—Low 2¾ M.P.H. High 3⅛ M.P.H.
Type of Engine—Vertical 4-cylinder, 4 cycle, valve-in-head. Cast in block, with removable honed cylinder sleeves machined to an even wall thickness. Bore 4⅜ inches. Stroke 5¾ inches.
Motor Speed—Normal R.P.M. 1,050.
Crank Shaft—Balanced chrome vanadium steel, heat treated—all bearings 2¼″ diameter.
Oiling System—Positive gear driven pump and splash.
Ignition—High tension Magneto, with impulse starter.
Carburetor—Gasoline, Kerosene or Distillate.
Vaporizer—Rodger's Fuel Saving.
Governor—Fly Ball, Variable speed
Cooling System—Tubular Type Radiator, enclosed. Water capacity—6¾ gallons.
Circulation—by centrifugal pump.
Clutch—Three plate type.
Belt Pulley—19″ diameter by 7″ crown face, balanced, steel, running 475 R.P.M. Located on left hand side, running forward.
Transmission—Wallis special, enclosed; two speeds forward, one reverse. Gears all drop forged, machine cut teeth and hardened.
Bearings—Timken adjustable bearings and ball bearings throughout.
Drive Wheels—48″ diameter by 12″ face.
Frame—Wallis patented, boiler plate, "U" shape.
Wheel Base—84 inches. Tread 49 inches.
Weight—4136 pounds.
Power—S.A.E. Recommended Rating, Drawbar 20 H.P., Belt 30 H.P.
Height Over All—55 inches.
Length Over All—131½ inches.
Fuel Tank Large—20 gallons.
Auxiliary Gas Tank—1¾ gallons.
Vaporizer Water Tank—1¾ gallons.
Traction Lugs—Special Massey-Harris two bolt 5″ drop forged steel spade lugs are standard; 6″ also available at slight additional cost.
Turning Radius—14 feet.

Certified





Results Drawn from Official Test No. 134

(Printed in full on page 24)

The Official Test No. 134 shows that—

The Wallis "Certified" Tractor pulled 75% of its weight on the drawbar at 2.98 M. P. H.

It delivered 76.55% of its maximum belt power to the drawbar—

It delivered One Horse Power at the drawbar for each 168 lbs. of its Lincoln Test Weight—

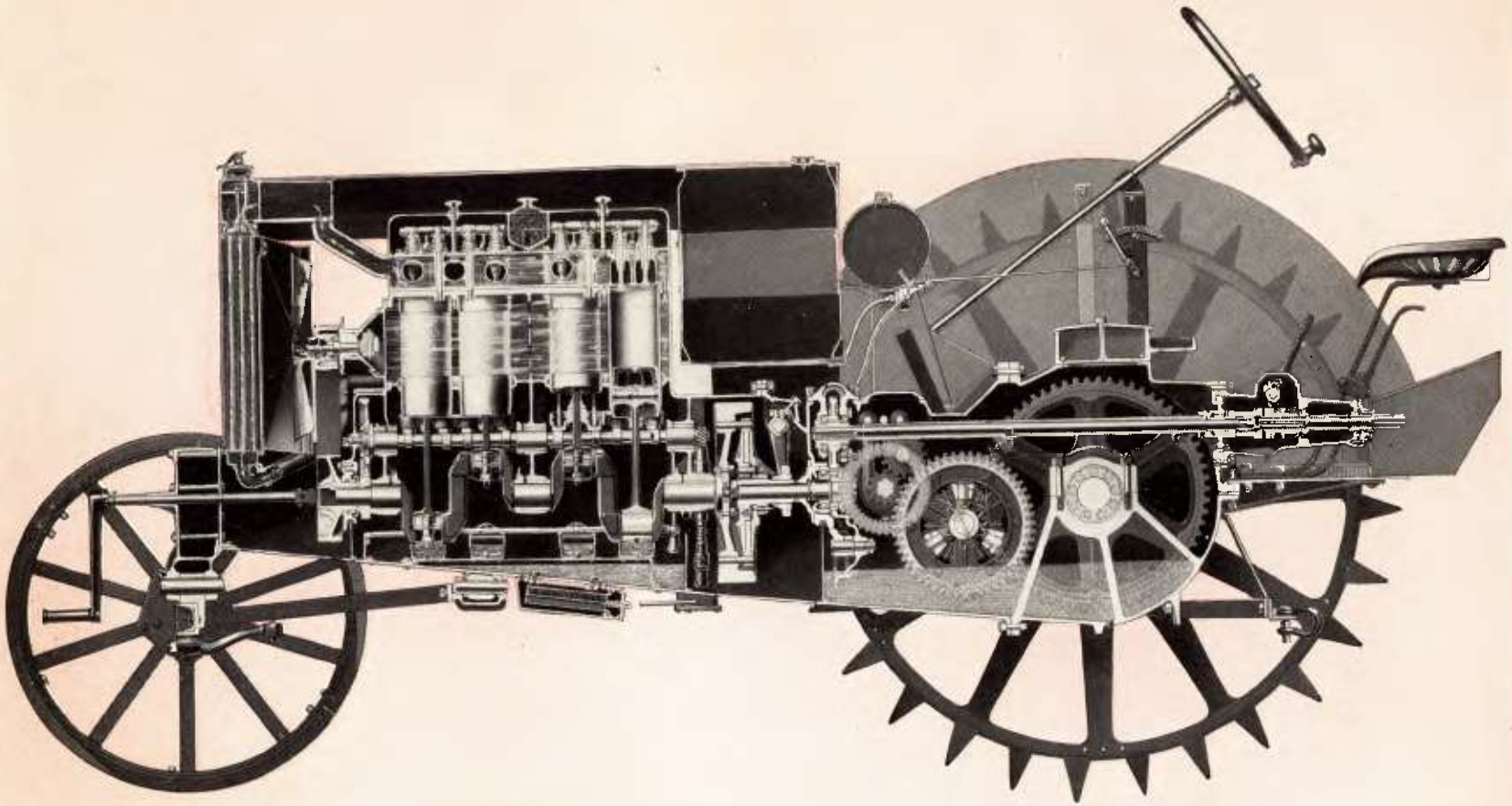
It developed One Horse Power at the drawbar for each 12.8 cubic inches of piston displacement—

It developed 7.68 Horse Power with each gallon of Distillate used per hour—(which was the highest fuel economy ever officially recorded for any wheel tractor approaching it in weight and piston displacement).

It accomplished all of this burning DISTILLATE with a perfect score.

Gallons, as noted above and elsewhere herein, refer to U. S. gallons of 128 ounces.

Light Simple Durable



Three Plow Power with Two Plow Weight

Certified

WALLIS 20-30 TRACTOR

Certified

Let us, at this point, emphasize—that Wallis Engineers never developed a single cylinder or two cylinder tractor—they started and continued to build our present modern type of 4 cylinder motor and saw other manufacturers build and abandon the one and two cylinder tractors. Vibration, the enemy of all motors, is at its highest point of destructiveness in the single and two cylinder types of motors. Wallis Engineers never employed excessive weight for the work to be done. They were the first to thoroughly enclose all the moving parts, including the master spur gear—they were the first to use the removable cylinder sleeve—they were the first to give the public a three plow tractor that weighed less than 4,000 pounds. They were the first to build a "Certified" tractor.

DURABILITY

Many other features are attributed to Wallis Engineering, but here is the answer—Correspondence indicates that practically all the Wallis Tractors ever built are in operation today. The work "Wallis" means more than "Tractor"—it means more than just "A" Tractor—it means "The Tractor"—"The Measuring Stick of the Tractor Industry," as is evidenced by owners' statements and engineers' vain attempts to copy it. No used tractor commands the high proportionate price of the Wallis—this means that the depreciation charge per acre against the Wallis is the very minimum.

RENEWABILITY

The wearing parts can be replaced with ease—Repair and production parts received the same careful inspection in every case.

ACCESSIBILITY

One look at the Wallis will impress one with the ease of reaching and adjusting the wearing parts.

Just remove the cylinder head to grind the valves—Pistons removed from top without disturbing the cylinder block—Oil screen removed and cleaned by removing two cap screws—oil pressure adjusted outside the case. Thru the hand holes in the Patented U-Frame the connecting rod bearings may be inspected, adjusted or removed—The crank shaft bearings inspected—The crank case cleaned—The clutch adjusted—The oil pump adjustment is on outside of frame.

ECONOMY

The Wallis "Certified" is economical in fuel consumption and due to its design—material and workmanship, it delivers more power at the drawbar than any other tractor approaching it in weight and piston displacement. When working over hilly or loose ground the light weight Wallis "Certified" is especially economical.

A minimum number of parts are used in the Wallis "Certified"—Those used are of the utmost simplicity and of an exceptionally efficient class of material and "Certified" workmanship.

REMOVABLE HOOD

The hood protects from dust and dirt, but being quickly removable affords easy access to the motor and other parts.

The hood over the motor is secured by four latches and can be removed in a few seconds.

COOLING SYSTEM

The radiator is tubular type, especially made for the Wallis. The core is suspended from the upper tank while felt pads are provided between the lower portion of the core and the radiator sides, thus affording protection against leaks which might be caused by jars or expansion and contraction.

Large water passages insure against clogging. The radiator is easily and quickly dis-assembled as the upper tank and the side members can be quickly removed leaving the core separate. This guards against the necessity of purchasing a whole new radiator should necessity require, as any of the integral parts can be ordered separately. The upper tank may be readily removed to expose the tubes for cleaning.

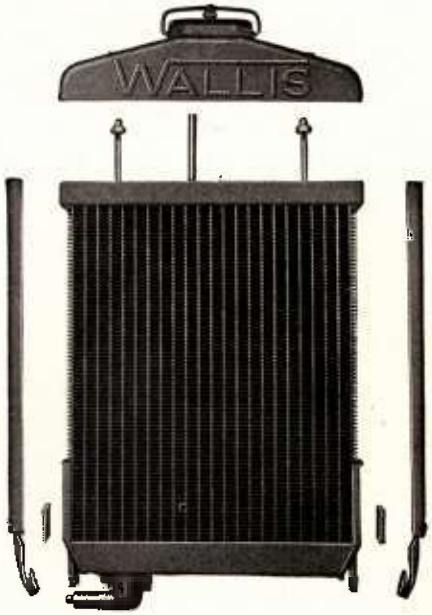
A pet cock at the bottom of the radiator, on the outside of the frame, facilitates draining and cleaning and also drains the centrifugal pump.

Large Capacity Tubular Radiator

The cooling system, which has a capacity of 6¾ gallons, consists of a radiator, water pump, connections, motor water jackets and fan. The water placed in the radiator is pumped from the radiator by a *centrifugal pump*, into the lower part of the cylinder block water jacket where it rises into the cylinder head and flows into the top of the radiator.

COOLING FAN

Cooling is assisted by a fan back of the radiator, which is driven by belt directly offthe fan drive pulley which is fitted to the crank shaft. The fan is mounted on a roller bearing and means are provided to allow taking up of slack in the driving belt. The capacity of this fan is 4800 cubic feet of air per minute, which air being drawn through the radiator is assurance that water is properly cooled even under the most adverse conditions.



WATER CIRCULATING PUMP

Water circulation is assured by means of an improved *centrifugal type pump* located on right side of motor between the magneto gear housing and the radiator. The drive is direct off the magneto gear through a positive and rigid connection. The capacity of this pump at normal motor speed is 15¾ gallons a minute, so that the entire water supply, when full, passes through the entire system approximately 3 times every minute.

Gallons, as noted above and elsewhere herein, refer to U. S. gallons of 128 ounces.

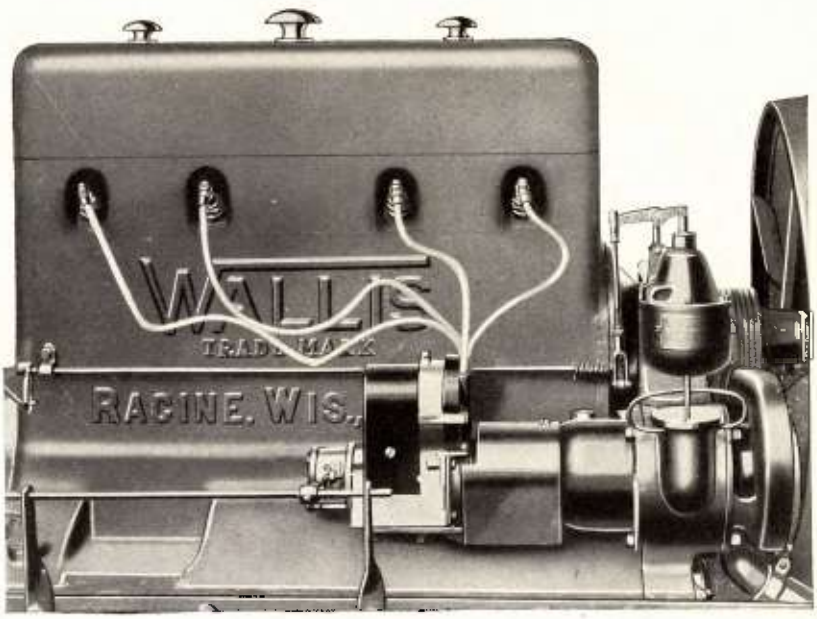
EASE OF OPERATION

There is no more work in operating a Wallis "Certified" than there is in running an automobile—it is self guiding when set for direction. The Wallis can turn within a radius of 14 feet.

Other tractors approaching it in piston displacement weigh about 50% more than the "Certified" Wallis.

OIL TIGHT AND DUST PROOF

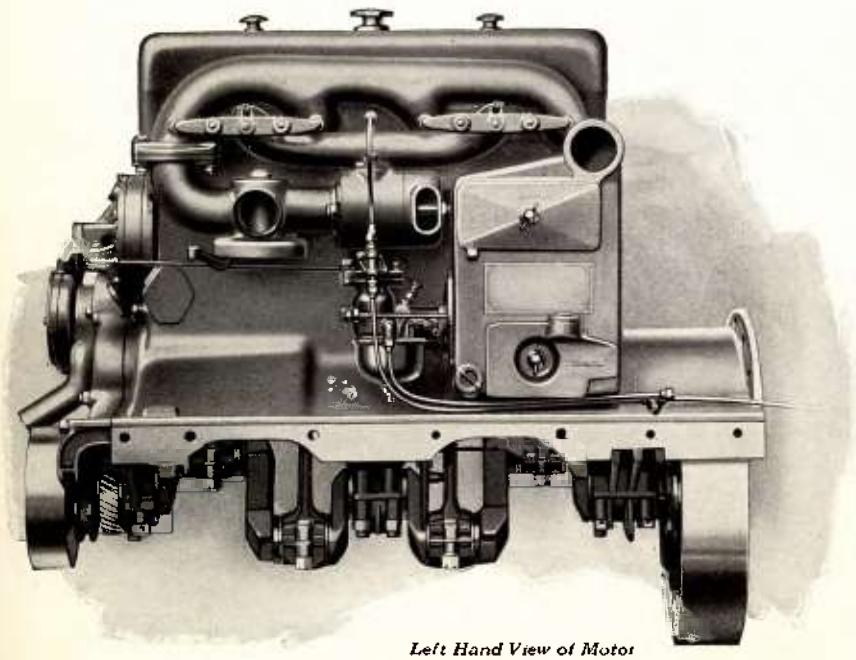
Dust being the cause of so much expense in tractor upkeep, the Wallis Engineers have made it a rule to run everything possible in oil because anything that will keep oil in will keep dust out.



Magneto and Governor Side of Motor

BALANCE

The Wallis "Certified" Tractor will pull a full load on the belt all day with a glass of water sitting on the hood and not spill a drop, because the reciprocating parts are balanced—because the pistons are the Famous DeLuxe Make, which are lighter and stronger than other makes—because the cylinder walls of the removable sleeves are honed which gives and maintains a closer piston fit—because the gases are both vaporized and atomized in passing through the Rodgers Fuel-Saving Vaporizer to the cylinders and balances the charge to each cylinder.



Left Hand View of Motor

The Wallis Delivers

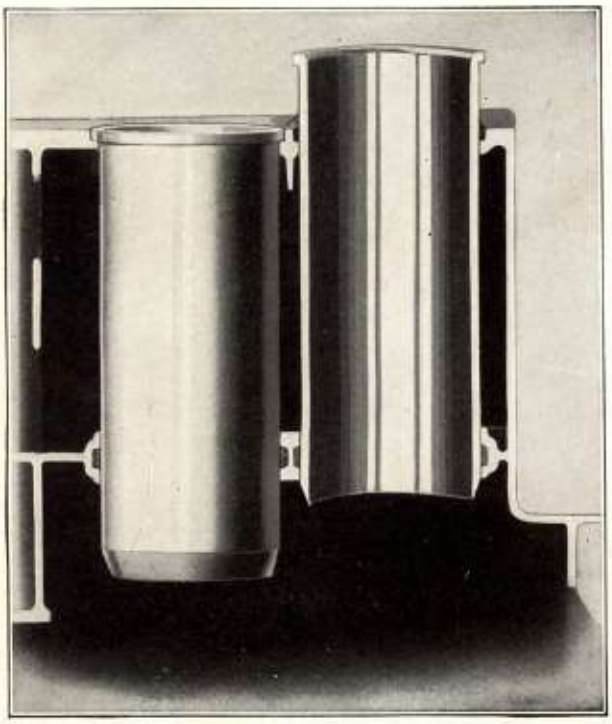
More Power
for
More Years
and at
Less Expense

Than any other tractor approaching it in weight and Piston Displacement

REMOVABLE CYLINDER SLEEVES

The cylinder sleeves in the Wallis Motor are the same design and type today and are interchangeable with those used in the first Wallis Motor built 13 years ago.

The grade of material used—the design of—the inspection received by the cylinder sleeves in a Wallis "Certified" Tractor Motor such as—machined inside and out to an even thickness of wall—honed to a high polish equal in smoothness of a cylinder which has run for months—tested under high water pressure, has established another standard for the Tractor industry in Motor construction.



CLUTCH

The clutch in the Wallis "Certified" is extremely simple in design and even more simple in adjustment and above all operates as smoothly as any automobile clutch. Control is by means of a hand lever conveniently located near the operator's seat. Disc plates are provided with twelve case hardened inserts in the disc plate, protecting against wear when clutch fingers are operating.

All parts that have to do with the adjustment of clutch are readily accessible thru hand hole in "U" frame. Adjustment can easily be made to 5-1000 of an inch. A grease cup provides means of lubricating clutch operating collar while discs do not require oiling.

PISTONS

Special Wallis Pistons — Light in weight — Heat treated—Rib braced—Perfectly round—Ground to a high polish—Balanced to within one quarter of an ounce of each other, are used. By using these pistons, we obtain—Increased power—Added strength—Less bearing pressure—Increased life—Added cooling—Reduced lubrication cost—Reduced fuel consumption—Reduced carbon—Elimination of vibration—Less up-keep cost—More flexibility. Piston pins are hardened, ground and polished.

Compare the weight of pistons used in Wallis tractors which average 50 ounces, with pistons in any other tractor and find out how many more pounds other tractor motors are required to move per minute, per hour and per day.

CONNECTING RODS

Drop forged, heat treated, specially ribbed high carbon steel—Exceptionally light with a surplus of strength.

This type of connecting rod has been used in the motor for 13 years. It is light and requires very little power to propel it.

"Certified" Wallis reciprocating parts are all light in weight but of superior design and quality.

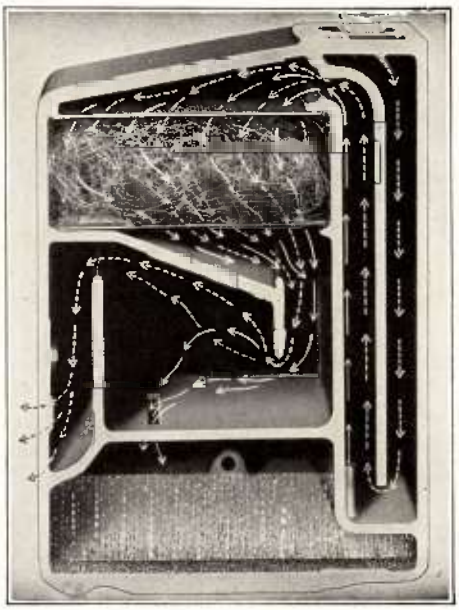
The connecting rod bolts are of Alloy Steel and heat treated using long castellated nuts with S. A. E. threads for strength and a cotter pin prevents them from backing up.

Every rod is the same weight—this eliminates vibration.

Wallis "Certified" Oil Air Cleaners

When air is being drawn by motor, it enters chamber here and passes thru oily wool which removes dust and dirt.

On outward pulsations, oil mist from overhead mechanism of motor is forced thru wool, cleansing it and leaving it oily.



Sectional views showing oil air cleaners used to prevent dust entering either thru carburetor intake or breather.

Air is passed through an oil mist and filter, which completely removes all dust and grit. Only clean air enters the motor. This insures long motor life, minimum repair expense and economy in lubrication. The University of California, after a rigid test of the WALLIS oil Air Cleaner, gave it an efficiency rating of 98.8%.

Carburetor

The carburetor is of improved type, so designed as to supply the proper fuel and air mixture, under varying conditions, as will render maximum results using minimum amount of fuel.

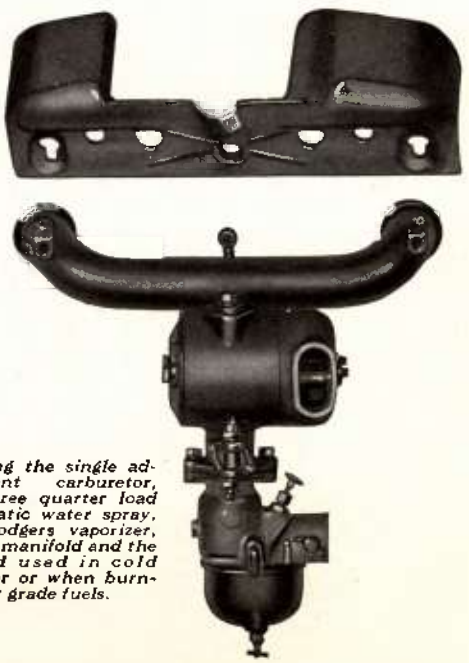
The bearings on the butterfly valve shaft are both sealed, thus eliminating the possibility of dust entering the carburetor at this point.

CARBURETOR CHOKE

A wire choke fastened to the radiator aids in starting.

A carburetor choke has been provided to enrich the fuel mixture when desired. This is within easy reach from the tractor seat and acts the same as a choke on an automobile. This eliminates the necessity for tampering with the single carburetor adjustment and has proved to be a real fuel saver.

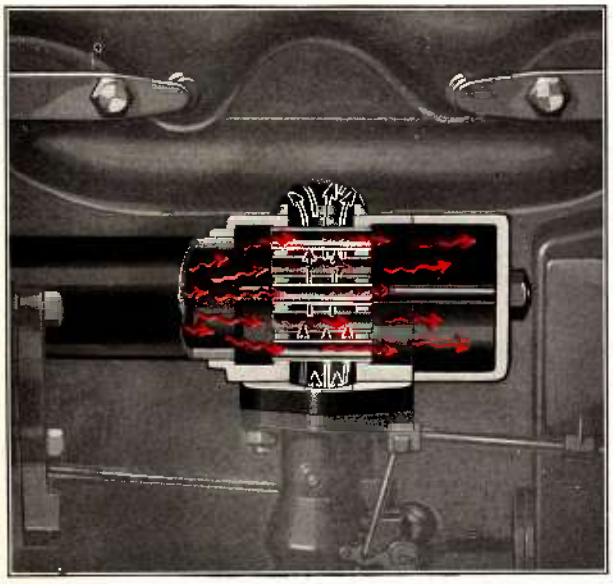
The simplicity and effectiveness of the Wallis "Certified" carburetion system is one of the outstanding features of the Wallis.



Showing the single adjustment carburetor, the three quarter load automatic water spray, the Rodgers vaporizer, intake manifold and the shield used in cold weather or when burning low grade fuels.

THE RODGERS PATENTED FUEL SAVING VAPORIZER

The red arrows, in the drawing below, indicate exhaust, heating a series of staggered tubes over and around which all fuel must pass. In so doing the fuel becomes thoroughly vaporized and further atomized.



So efficient is the new vaporizer that when kerosene or distillate is used for fuel the tractor will idle indefinitely.

Everyone familiar with the burning of kerosene knows more or less about the use and value of water—and the use of a hot spot against which the fuel strikes on its way to the cylinder in the contact of which the vaporization takes place.

The Rodgers vaporizer consists of a series of tubes thru which the exhaust heat is directed in any amount necessary to get the correct temperature, to properly vaporize the fuel. The operator has full control of the heat from his seat and once adjusted to the load no further attention is necessary.

The water supply is automatic—it comes on at ¾ load or over. The water does not cool the vaporizer nor scale it over because it does not go thru the heater at all—it enters above the vaporizer and only at ¾ or more load which is when the most heat is generated. This is one secret of the flexibility of the Wallis "Certified" when burning kerosene or distillate.

The vaporizer is a fuel saver even when burning gasoline as just the amount of heat can be used to vaporize the heavier ends of the fuel which ordinarily are sucked in and pass by to the crank case to thin the oil. The Rodgers vaporizer, when adjusted, is always just hot enough to vaporize the amount of fuel required for the load.

FLY BALL VARIABLE SPEED GOVERNOR

The motor speed can be set where desired and accurately maintained by operator from the seat.

WALLIS IGNITION

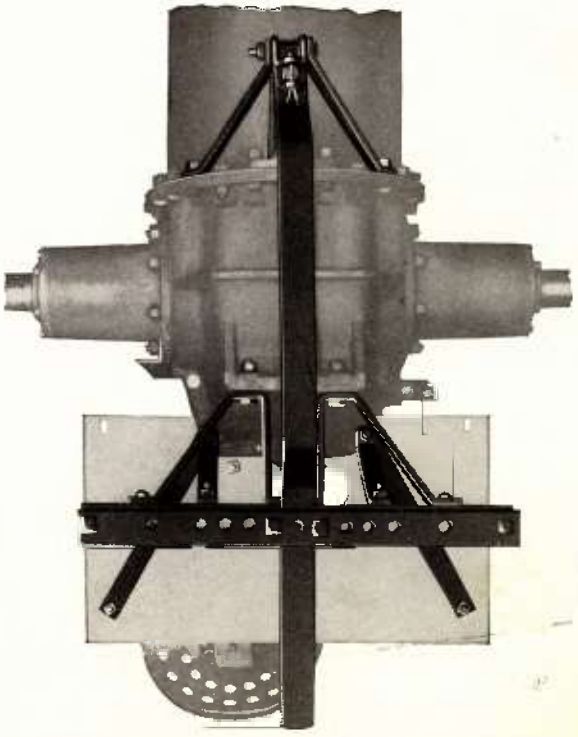
We use a high-tension magneto of the finest make, equipped with the Wallis impulse starter, which makes starting easy. The impulse starter is built into a separate housing which relieves all strain on the magneto. High grade spark plugs easily accessible for testing and cleaning when required. Being thoroughly water and dust-proof, the magneto is not affected by weather.

REMOVABLE CYLINDER HEAD

With this method of construction the operator or any mechanic can quickly and easily remove the nuts from the bolts that hold it in place, remove it to a bench, grind the valves, remove the carbon from pistons and cylinder head, and remove the cylinder sleeves when necessary.

SWINGING DRAW BAR

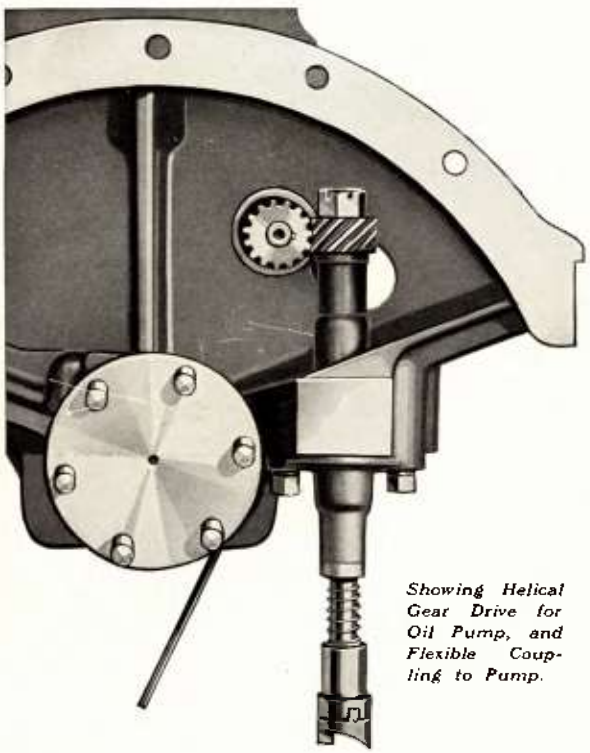
(Extra Equipment)



Bottom View of Rear Axle Showing Swinging Draw Bar Hitch

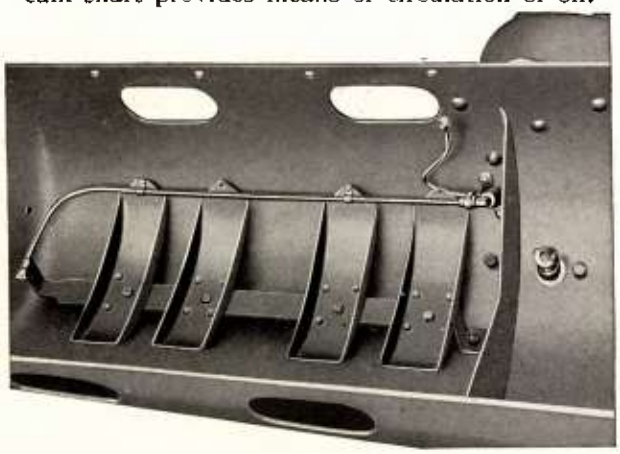
LUBRICATION

One of the most important features of a tractor is the lubrication. The life of working parts made of metal and the success with which they perform their function is directly proportionate to the manner in which they are lubricated.



Showing Helical Gear Drive for Oil Pump, and Flexible Coupling to Pump.

A force feed gear driven pump, of large capacity driven from helical gear on the end of the cam shaft provides means of circulation of oil.

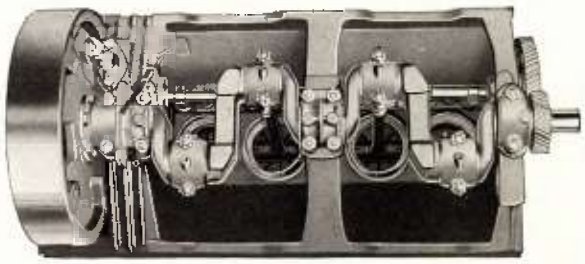


Showing Oil Dip Pans in U Frame with Oil Delivery Pipe Fastened to Pans—Also Flexible Pump Connection Inside of Frame. A Hole in the Curved End of Oil Pipe Throws a Constant Stream of Oil to the Timing Gears.

Immediately on starting motor, the pump draws oil from a sump which is placed under the "U" frame crank case compartment, which being lower than any other part of the crank case is certain to contain oil even though the tractor is encountering a severe grade. The pump provides sufficient oil, through a copper tube to the splash pans under each connecting rod to keep them to the overflowing point.

SPLASH OILING SYSTEM

With the connecting rods dipping constantly into the well filled oil pans the motor cylinder walls are lubricated by the oil thrown off the connecting rod ends. Connecting rod bearings are, of course, lubricated by the oil picked up in the splash, while the valve stems, rocker arms, etc. are lubricated by the oil mist which rises from the motor crank case through the tappet rod passages to the cylinder head. The main bearings, the cam shaft and timing gears are lubricated by pockets which catch the oil draining back from the splash.



Interior View of Certified Motor Which Operates in a Continuous Oil Bath

Hand holes in the "U" frame afford accessibility to all parts in the crank case compartment for inspection and to ascertain that all parts are being lubricated. In addition, a dial pressure gauge, visible from the driver's seat, shows at all times if pump is working.

Showing Force Feed Oil Pump—Oil Sump, Oil Filter Screen and Pressure Adjustment.

Wallis "Certified" Transmission

To transmit the most power from the motor to the draw bar with a minimum loss of power is an accomplishment of Wallis engineers, who were the first to work it out over 13 years ago.

The gears are drop forged steel—the teeth are all accurately machine cut. Each gear is heat treated and hardened. The oil in the enclosed transmission case acts as a cushion so the teeth never come in contact with one another, consequently, long life. Gears in tractors which have been out 13 years show very little wear which is natural, due to the elimination of metal to metal contact, by having the gears oil cushioned.

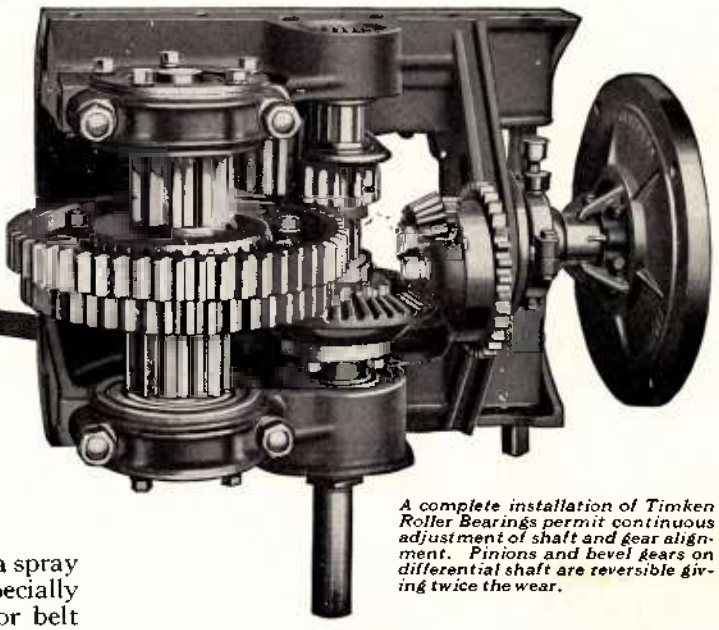
The shafting is of *chrome vanadium steel*, heat treated and accurately machined, ground and polished.

An oil gear, driven all the time, throws a spray of oil to all parts and bearings and is specially useful when the tractor is being used for belt work, as it is not necessary to increase the oil level in order to lubricate the bearings.

The differential, being located between motor and rear axle, the strain is lessened in the ratio of 19 to 110 as when used in the rear axle assembly—no one ever saw a Wallis with the rear end pulled out and the location of the differential has much to do with it.

The two drive pinions and bevel gears may be reversed, thus giving double wear to the teeth.

The transmission case is made of high grade cast iron, strengthened with supporting and bracing webs which give it the necessary qualities which have stood the test more than 13 years.



A complete installation of Timken Roller Bearings permit continuous adjustment of shaft and gear alignment. Pinions and bevel gears on differential shaft are reversible giving twice the wear.

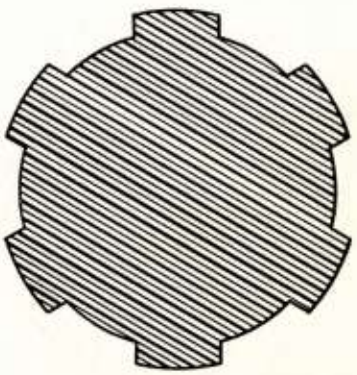
TRANSMISSION LUBRICATION

The transmission gears and master gears run in a continuous bath of oil. These gears circulate the oil, insuring lubrication of the bevel gear and pinions as well as the adjustable roller bearings in the transmission case and in the rear axle housing.

Engaging with the small spur gear on drive shaft for Power Take-Off, and located below it, in the oil, is an oil spray gear. For belt work, the bearings and all gears will at all times be well lubricated.

CHROME VANADIUM SLIDING GEAR SHAFT

To safely transmit the phenomenal power of the WALLIS motor, and in keeping with its general ruggedness, large heat treated, accurately ground, chrome vanadium steel shafting mounted on adjustable, tapered Timken bearings is employed.



Exact size of the Chrome Vanadium Steel splined sliding gear shaft.

The splines are cut into the solid shaft and the shaft is heat-treated, hardened and ground to size which insures the strongest, most accurate and longest wearing shaft known today. It costs more to make that way, but it is worth it.

The Original WALLIS Patented U-Frame

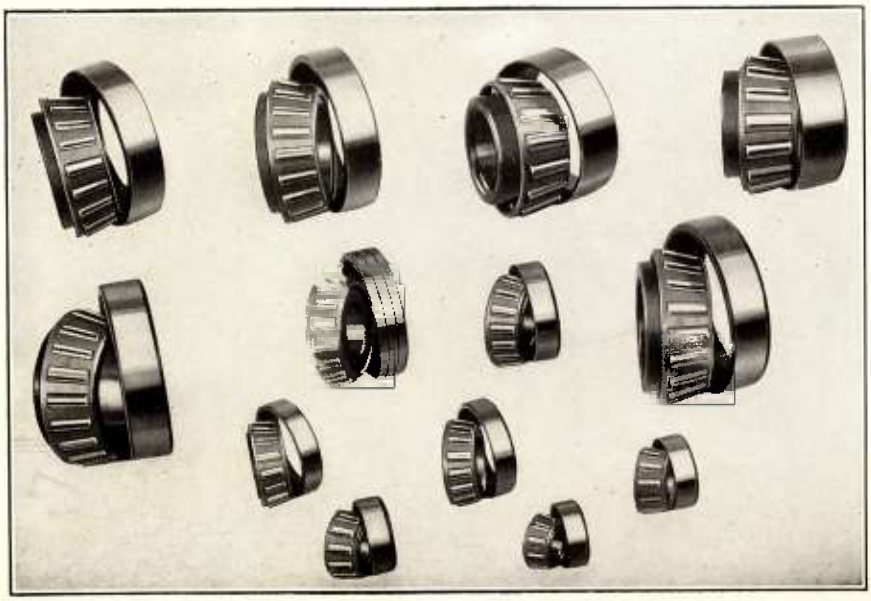
Of all the experiments, inventions, refinements and improvements—practical and otherwise, developed and introduced during the past fifteen years, by the engineering talent of the Tractor World, the WALLIS Patented U-Frame is the one paramount outstanding achievement in the history of the Industry, representing as it does, in one piece, the oil reservoir, crank case, transmission case and supporting main frame.

Of the best quality steel plate, pressed into shape by powerful machinery, the WALLIS U-Frame stands up rigidly under enormous pressures—positive assurance against damage by the usual twisting and bending strains in farm work.

Quite aside from the vitally important factors of strength and light weight—the WALLIS U-Frame being acknowledged the lightest and strongest main frame construction known to modern engineering science—the U-Frame forms the basis for a perfect lubrication system, which is of such vital importance to motor wearing parts. The one-piece construction furnishes, immediately beneath the working parts, an ideal, sealed oil reservoir, absolutely dust-proof—positive assurance of clean oil at all times, free from dirt and grit, the twin enemies of all motors. A guarantee of long motor-life and insurance of minimum repair expense.

To a very large extent the U-Frame is responsible for the WALLIS weighing from 1,000 to 3,000 pounds less than other tractors approaching it in piston displacement.

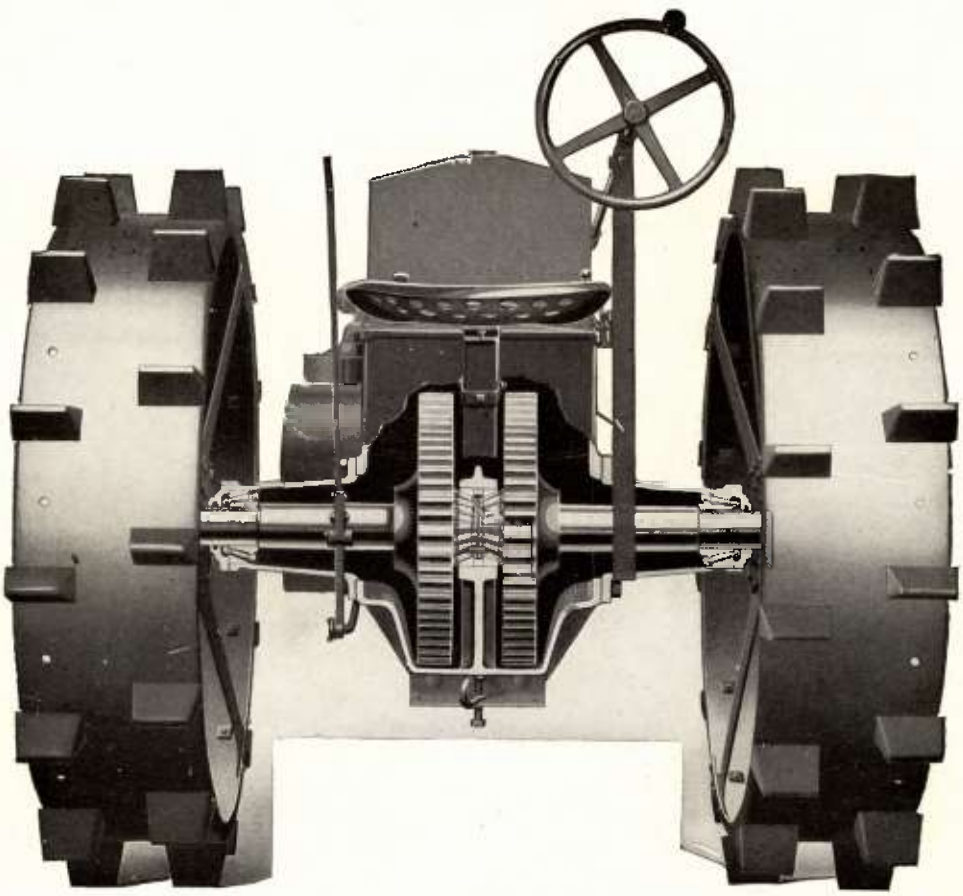
TIMKEN TAPERED ROLLER BEARINGS



The Timken Roller Bearings which are built into the Wallis "Certified" are especially adapted for the severe service encountered in these applications. The positively aligned rolls and tapered design as well as the steel from which they are made, reduce friction in these parts and increase the working capacity of the tractor. Besides overcoming thrust, shock and radial load, they entirely eliminate shaft wear, by constantly keeping in perfect alignment, the parts of the tractor in which they are used.

WALLIS 20-30 TRACTOR Certified

Rear Axle Construction



The rear axles and the two master gears which are securely keyed to them are all contained in the rear axle housing, a casting which is bolted to a flange on the "U" frame with a cork gasket between the sections, thus forming a dust proof housing, which also acts as an oil reservoir.

The rear axles are 3½ inches in diameter and ground to exact size.

At the inner end of each axle is a large, adjustable, tapered Timken roller bearing resting upon a heavy supporting bracket which is a part of the rear axle housing.

The two master gears are pressed onto the rear axles in a hydraulic press under a pressure of approximately 50,000 pounds and are securely keyed, and a large nut with a cotter pin holds it securely in place.

These gears may be reversed giving double tooth wear.

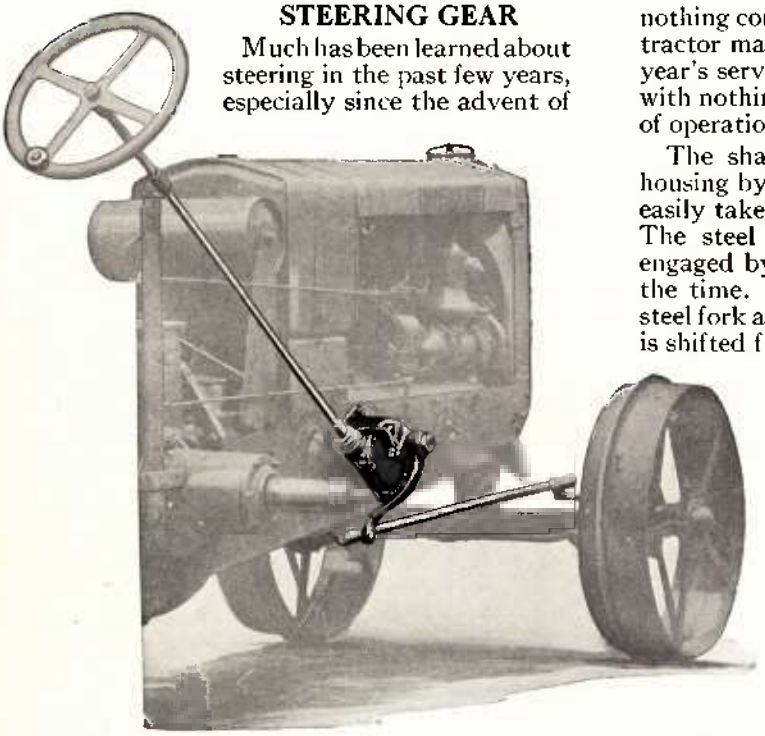
A sleeve fits over the outer ends of the rear axles and is securely bolted to the rear axle housing with a gasket between, giving assurance of a dust and oil-proof connection.

On the outer end of the axles the two drive wheels are keyed. These are supported by large, adjustable, tapered Timken roller bearings mounted in the sleeves.

These bearings may be adjusted by means of shims at outer edge of sleeves.

STEERING GEAR

Much has been learned about steering in the past few years, especially since the advent of large busses and heavy motor trucks. We took advantage of the experience gained in heavy duty service, and adapted conventional steering design to the Wallis Tractor. It was done at a considerable expense, but we have the satisfaction of furnishing a strictly high grade gear and connection, nothing comparable to it being used by any other tractor manufacturer. It has gone through two year's service in the Wallis "Certified" Tractor with nothing but praise for its efficiency and ease of operation.



The shaft is supported at each end of the housing by a ball bearing—end play can be very easily taken out with the adjustments provided. The steel spiral, machine-cut and ground, is engaged by a block with four teeth in mesh all the time. The block operates the drop forged steel fork and it increases its leverage as the block is shifted from one end to the other—constantly in a bath of oil, it can't wear out.

It steers very easily, having a tremendous leverage, and the least possible amount of friction; guiding in the field requires usually from three to five inches movement of the steering wheel, and at the end one full turn is about all that will ever be used.

The steering wheel is 18", with large hand grip. The wheel is adjustable at connection with steering rods, so that the steering knob will always be on the bottom of the wheel, making it self guiding. The steering gear itself, of course, is irreversible.

The steering arms are drop forgings and the steering link has the conventional style of ball and socket spring take-up joint.

The steering gear is attached to "U" frame by means of a cast steel housing, bolted and riveted to "U" frame. The steering gear shaft and the steering arm attaching have a taper fit and teeth actually hobbed on each member, making a perfect joint.

The new steering gear can be installed on earlier models of Wallis tractors.

FRONT WHEELS

The front wheels are mounted on Timken bearings. They are 30 inches in diameter with a 6 inch face and are of ample strength.

Front Axle Assembly showing alignment, adjustment and drop forged steel steering knuckles, adjustable Timken Roller Bearings, also frame bracket with axle bumpers.

Steering Knuckles are fitted with Alemite Connections for lubrication.

INTERNAL POWER TAKE-OFF

One of the outstanding features of the Wallis has always been the simplicity of its practical, efficient design. *Built to take the full motor load.*

An Internal Power Take-Off can be installed on all Wallis "Certified" Tractors when desired.

The primary drive of the Power Take-Off is obtained by placing a spur gear on the drive shaft, just back of the bevel drive pinion. This gear is on all "Certified" tractors.

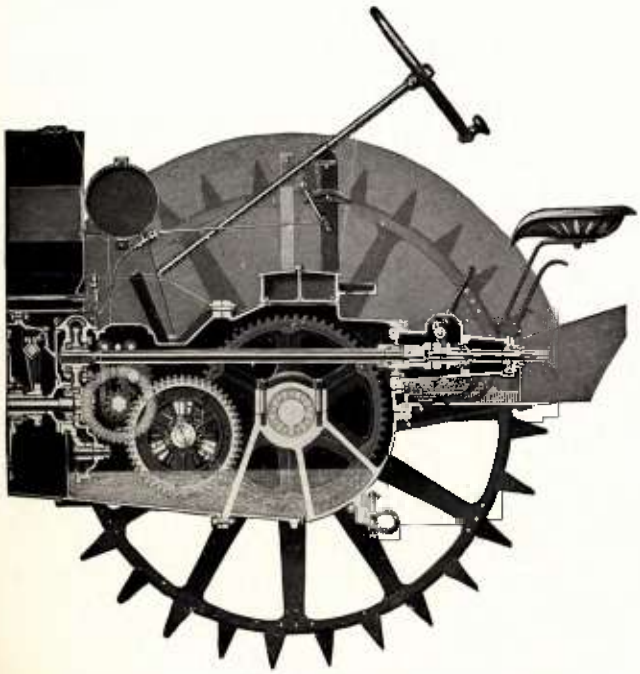
When it is desired to install a Power Take-Off, the forward transmission cover is removed, and at that point a housing is substituted which carries a gear mounted on two Timken bearings which engages in the spur gear just referred to. It is splined so that the Power Take-Off shaft may be inserted from the rear.

The drive is positive—no slippage—capable of delivering full motor power—it becomes an integral part of the tractor. The spline shaft to which the universal joint connection is made is the standard recommended as well as the direction of rotation and a shaft speed of 545 R.P.M. The spline shaft is covered to protect the operator.

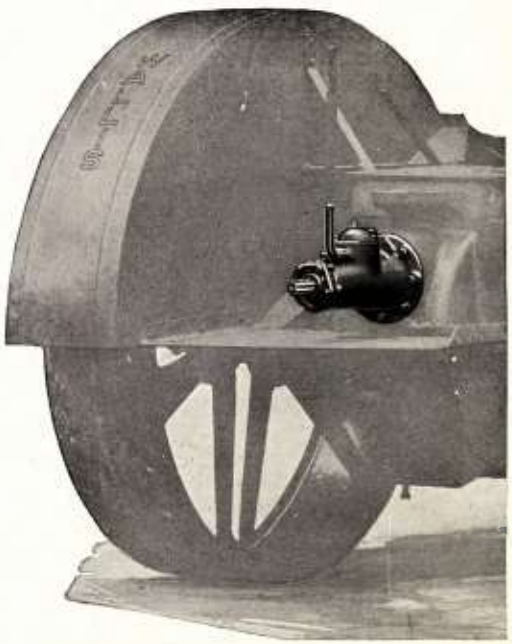
The Power Take-Off can be used when tractor is standing still or when in motion.

A big advantage of the Wallis Internal Power Take-Off is that on drawn machines equipped with balance wheels or cylinders, the speed of the drawn machine can be obtained with the tractor standing and then the tractor clutch disengaged—the gears shifted and the tractor started without having to start both tractor and drawn machine at the same time.

A ratchet jaw clutch is provided which permits the drawn implement to continue running when the tractor is stopped, as very often where a balance wheel is used on the drawn machine the balance wheel will continue to run after the tractor has been stopped.



Above cut shows complete Power Take-Off installation

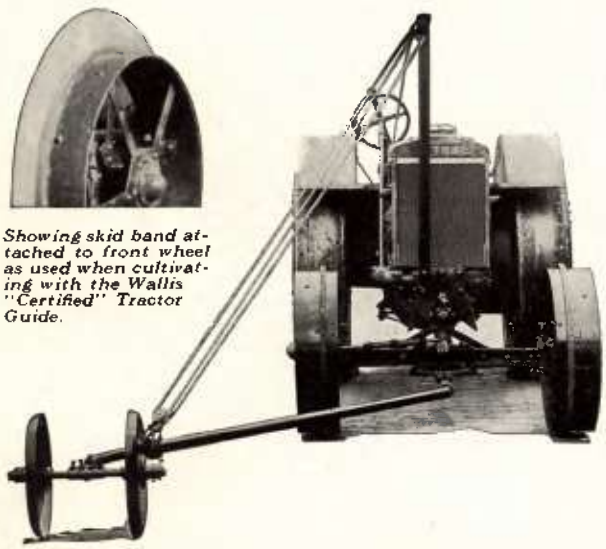


The spline shaft connection is 1¼" standard. 1⅜" spline shaft connection can be furnished.

THE WALLIS AUTOMATIC TRACTOR GUIDE FOR TWO AND THREE ROW LISTERS

Reversible—Operator can swing it from one side of the tractor to the other, without leaving the seat, making it possible to list back and forth, or around the field, as desired.

Adjustable for different widths and when set the spacing between the rows is accurate.



Showing skid band attached to front wheel as used when cultivating with the Wallis "Certified" Tractor Guide.

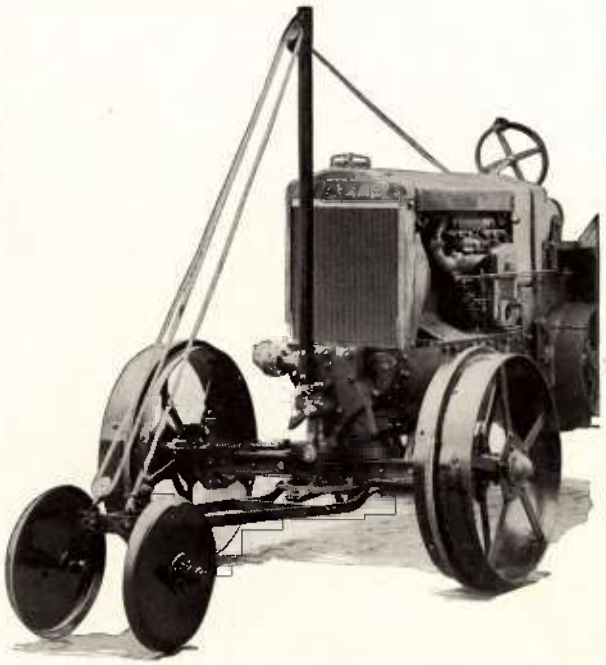
THE WALLIS AUTOMATIC TRACTOR GUIDE FOR LISTED CORN

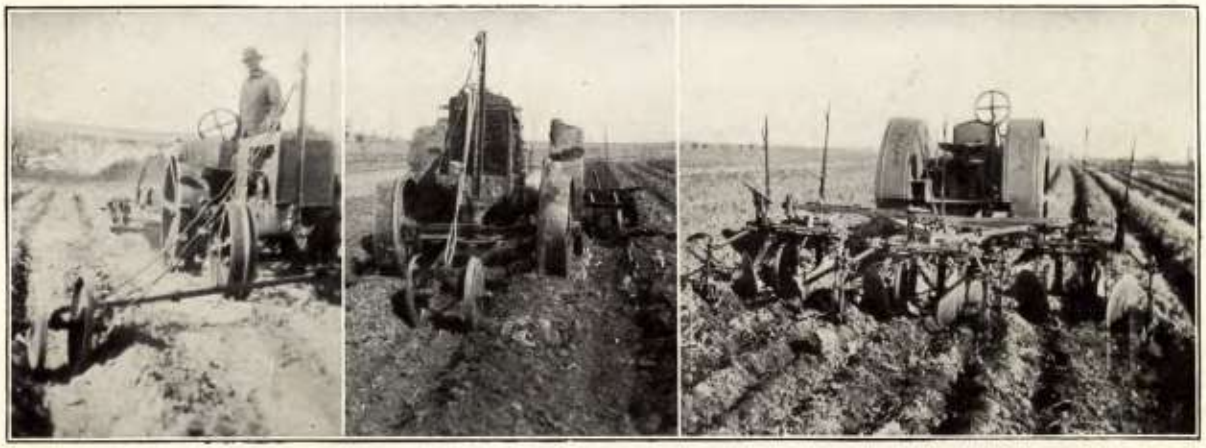
The Wallis Automatic Tractor Guide makes it possible to cultivate listed corn with a Wallis Tractor which has never before been practiced, due to the physical effort required to hold the tractor on the ridge.

The guide travels in the trench straddled by the tractor wheels.

The guide wheels are ahead of the tractor and hold the front tractor wheels (which are fitted with wide skid bands) on the center of the ridge. The arch between wheels is adjustable for different width trenches, making it possible to do a better job of cultivating than can be done with horses, with little effort on the part of the operator, except to turn at the ends. Due to its automatic action in guiding the tractor, the operator can give his entire attention to cultivation.

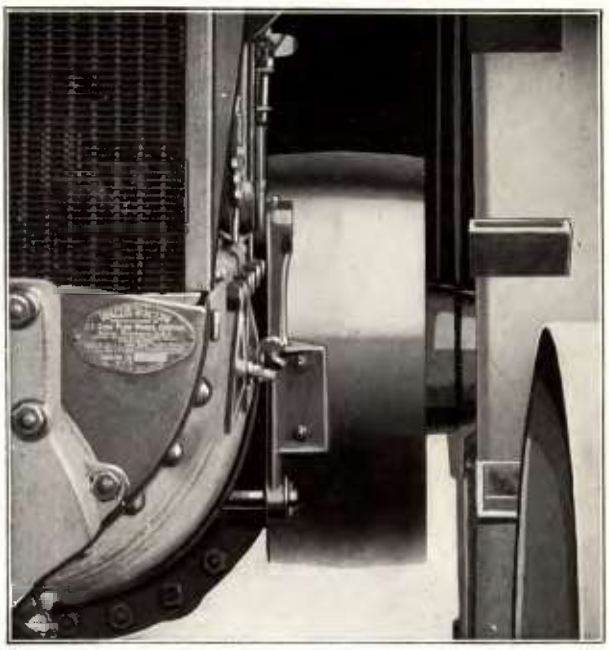
The Wallis Tractor equipped with this automatic guide and a Massey-Harris "Triplet" (three row) cultivator will cut the cost of cultivation at least one third, to say nothing of the time saved by the steady speed of the Wallis "Certified" as compared to horses.





ACTION—With the "Certified" WALLIS Tractor Guide.

Pulley For Belt Work



The belt pulley is made up of pressed steel, is 19 inches in diameter, with 7 inch crowned face and runs at 475 revolutions per minute at normal motor speed.

The belt pulley is securely clamped and keyed to the sliding gear shaft of the transmission, thus guarding against any possibility of belt pulley slipping. When the transmission is in neutral and the clutch engaged, a 2.1 to 1 reduction is obtained without the use of additional gears. The sliding gear shaft on which pulley is mounted is supported by two Timken adjustable roller bearings. The pulley can be easily and quickly removed.

The throwing out of the clutch by means of lever near operator's seat, automatically applies a brake with a wood facing upon the face of the belt pulley, thus quickly stopping the pulley and the belt driven machine.

Wallis Power at Work

Official Lincoln, Nebraska Test No. 134

WALLIS—The Massey-Harris Co., Inc., Racine, Wisconsin

This tractor was tested April 29 to May 10, 1927. The equipment included an American Bosch "ZB4Ed26" magneto, Kingston "L" carburetor and 28 spade lugs per wheel, 4 inches high by 4x2½ inches. The distillate used as fuel in these tests weighed 6.90 lbs. per gallon.

The rated load and first maximum load tests were made in low gear, the second maximum load test was made in high gear. The distance advanced by the tractor without load on level ground for several complete revolutions of the drive wheels was taken as a basis for calculating the slippage.

During the complete test consisting of about 38 hours running, the following oil was used: For the engine, 3½ gallons of Mobiloil A, 1¾ gallons to fill crankcase, 1¾ gallons added during test. For the transmission, none gallons of heavy transmission oil.

No repairs or adjustments were necessary during this test. At the end of the test the tractor was in good running order and there were no indications of undue wear nor of any weakness which might require early repair.

Brief specifications: Motor, own, 4 cylinder, valve-in-head, vertical, mounted crankshaft lengthwise. Bore, 4⅜ inches; Stroke 5¾ inches. Rated speed 1050 r.p.m. American Bosch "ZR4Ed26" magneto. Kingston "L" carburetor. Wallis, dry, cloth screen type air cleaner. Pickering flyball type governor. Chassis: Four wheels, two drivers, enclosed gear drive, clutch, dry plate, twin disc. Advertised speeds: Low, 2¾ m.p.h.; high 3 1/3 m.p.h.; reverse, 2¾ m.p.h. Total weight as tested (with operator) 4523 pounds.

Remarks: The rate of travel of this tractor is: Low, 2.88 m.p.h; high, 3.49 m.p.h.; reverse, 2.88 m.p.h. The above speeds are calculated at the rim of the drive wheels and at 1050 r.p.m. of the engine. In the advertising literature submitted with the specifications and application for test of this tractor, we find some claims and statements which cannot be directly compared with the results of this test as reported above. It is our opinion that none of these are excessive or unreasonable except as noted above.

BRAKE HORSE POWER TESTS

Test No. 134

Horse Power Developed	Crank Shaft Speed R. P. M.	Length of Test Min.	Fuel Consumption: Kind of Fuel	Fuel Consumption: Amount Used per Hour Gallons	Fuel Consumption: Horse Power Hours per Gallon	Water Consumption Gallons per Hour: In Radiator	Water Consumption Gallons per Hour: In Fuel Mixture	Water Consumption Gallons per Hour: Total	Temperature *Cooling Fluid Deg. F.	Temperature of Atmosphere Deg. F.	Humidity %	Barometric Pressure Inches Mercury
RATED LOAD TEST												
30.24	1052	60	Dist	2.942	10.28	0.95	0.00	0.95	210	70	33	28.04
**** VARYING LOAD TEST**												
30.26	1051	10										
30.11	1043	10										
0.91	1234	10										
8.45	1163	10										
16.04	1111	10										
23.38	1080	10										
18.95	1113	60	Dist	2.130	8.90	0.82	0.00	0.82	182	70	37	28.04
MAXIMUM LOAD TEST												
35.29	1050	120	Dist	4.232	8.34	0.00	0.00	0.00	183	63	50	28.68
HALF LOAD TEST												
15.74	1090	60	Dist	1.843	8.54	0.00	0.00	0.00	163	68	43	28.04

* Taken in discharge line from engine.
** The last line is the average for the hour.

DRAWBAR HORSE POWER TESTS

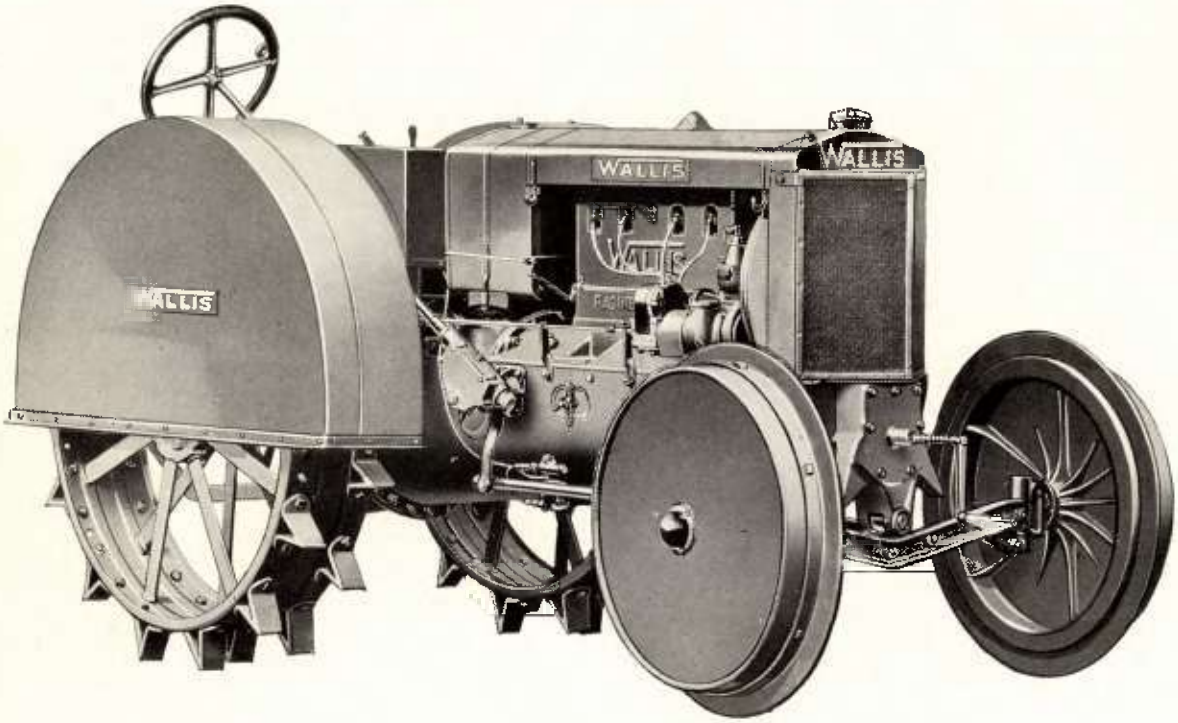
Test No. 134

Horse Power Developed	Draw Bar Pull Pounds	Speed Miles per Hour	Crank Shaft Speed R. P. M.	Slippage of Drive Wheels %	Fuel Consumption: Kind of Fuel Used	Fuel Consumption: Amount Used per Hour Gallons	Fuel Consumption: Horse Power Hours per Gallon	Water Used per Hour Gallons	Temperature of Cooling Fluid * Deg. F.	Temperature of Atmosphere Deg. F.	Average Humidity %	Barometric Pressure Inches Mercury
RATED LOAD TEST. TEN HOURS												
19.80	2452	3.03	1048	9.30	Dist.	2.579	7.68	0.00	173	46	60.5	28.61
MAXIMUM LOAD TEST												
27.015	3409	2.98	1047.5	10.95	Dist	-- Not recorded --			171	69	37	28.81
26.36	2625	3.77	1054	7.98	Dist	-- Not recorded --			175	69.5	37	28.81

* Taken in discharge line from engine.

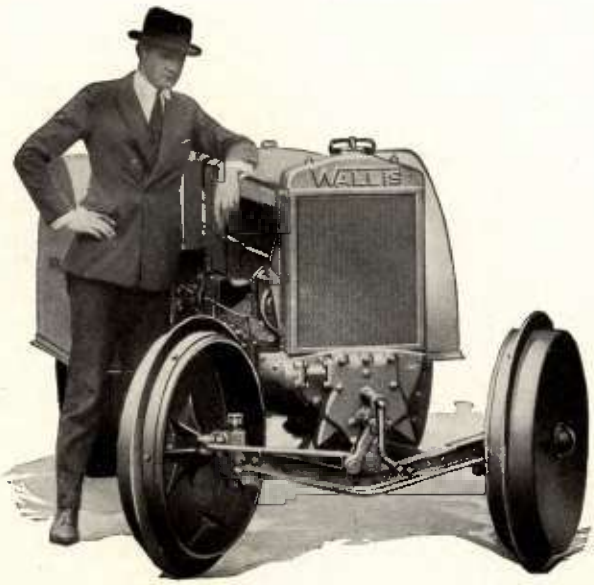
Rating *According to the standards of the American Society of Automotive Engineers, the Department of Agriculture of the State of Nebraska, and the Test No. 134, made by the latter, the Wallis "Certified" Tractor is entitled to a drawbar rating of 20 H. P. and a belt rating of 30 H. P.*

WALLIS



An Orchard and Vineyard Tractor to Fit the Job

The Wallis "Certified" for Orchard and Vineyard work has just the same motor—frame—transmission and in fact, all of the qualities that have been built into Wallis construction over a period of twelve years and in addition it has been so simply and effectively accommodated to the orchard work that its popularity and range of performance is growing each day. It is a low—narrow — protected — easily steered Tractor—light in weight—heavy on power—burns California distillate, kerosene or gasoline economically—and has 15 years of experience with one type tractor built into it.



A Few of the Outstanding Features of the Wallis "Certified" Orchard Tractor

Total Height, 49 inches.
Total Width, 52 inches.
Outside Turning Radius, 13 feet.
Enclosed Front Wheels.
Full Fenders for Rear Wheels.
Light Weight (4,000 lbs.)
Uses Low Grade Fuel.
Low Operator's Seat with Clear View.

Certified

We own three Wallis Tractors and are well pleased with their operation. Will buy one of the new Orchard Tractors, as they are more suitable for our peach orchard. We are for the Wallis as it meets our every requirement.

TABOR BRO., Red Bluff, Calif.

Have bought our second Wallis Tractor. The first one we had seven years and traded it in on an orchard Model. This one we have been using for three years and our upkeep has been less than forty dollars. We are well pleased.

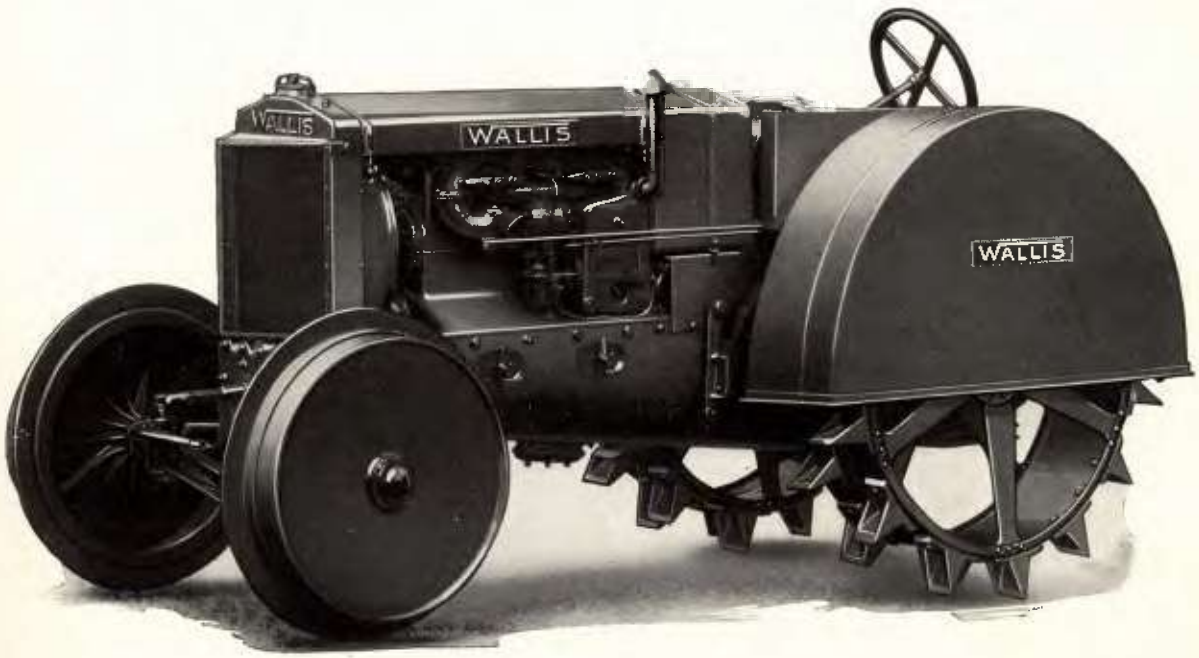
F. STAHL, Sacramento, Calif.

In the 7 years I have had my Wallis doing vineyard work, it has not cost me $50.00 in parts. It burns less fuel and oil than any other tractor hereabouts and will out-pull any of similar rating.

GEO. HEMPHILL, Lodi, Calif.

Three years ago I purchased my second Wallis Tractor. Traded the old one for one of the new Orchard and Vineyard Tractors. And, I have been burning stove tops for fuel which burn successfully. My total expense is $1.80 per day for fuel and oil.

E. GERBER, Sacramento, Calif.



Traction Equipment

DRIVE WHEEL

The Wallis engineers have built a drive wheel of minimum weight, but at the same time having maximum strength. This rim is made of a heavy 14 inch steel plate with edges bent towards center of wheel forming a light but extremely rigid channel tire. This also permits of the use of wide, flat spokes, set staggered and with shoulders at each end of spokes and riveted, which is the strongest possible spoke construction.

Showing 12" Extension Rim and Special Rice Angle

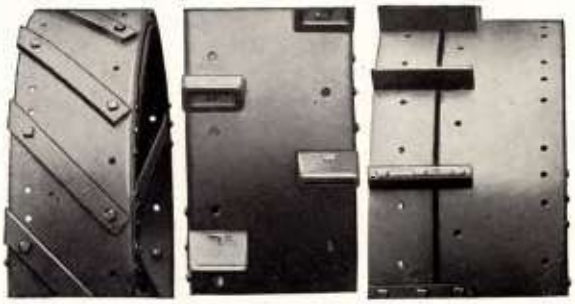
The hub is a malleable casting which is heavily reinforced where keyed to the axle in order to take the strain. In outer hub flange are two holes so that a wheel puller can be easily applied if ever necessary to remove a drive wheel. The axles are carried on four Timken roller bearings.

The rear wheels are 48 inches in diameter with a 12 inch face, to which either spade grousers or angle grousers can be fitted.

Traction equipment shown herewith meets practically every condition of soil.

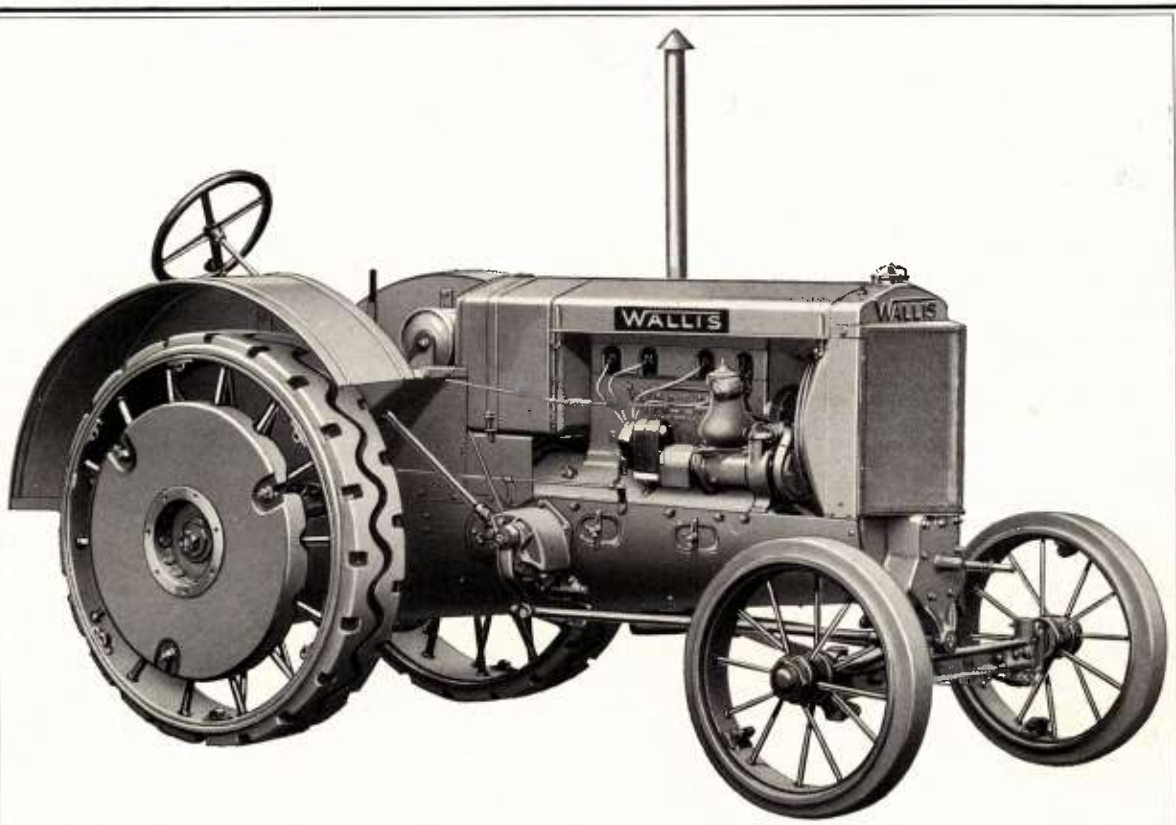
Special conditions can be overcome with combinations of this equipment. The front wheels are 6 in. wide.

Standard Drive Wheel with overtire and two-bolt heat-treated spade lugs.



¾" x 2" x 17" Flat — *Standard 4" x 4½" Spade Lug* — *6" Extension Rim with Angle Cleats*

4" x 15" Angle — *2½" x 25" Angle* — *4" x 36" Angle* — *4" x 25" Angle* — *2½" x 17" Angle*



IN ANSWER to the demand from the industrial field we are prepared to furnish the Wallis Industrial with all the features of the Standard "Certified" Wallis Tractor.

Doland, S. Dak.

The Massey-Harris Co.
Racine, Wis.
Gentlemen:

Thought I would tell you about the success I have had with the Wallis OK Tractor that I have run on maintaining the roads the last three years. I have run it 17,000 miles and in five years work it has cost me $15.00 in repairs and I certainly would be pleased to recommend a Wallis to anyone. My tractor is as good today as when I bought it.

Yours truly,
H. E. Flint.

WALLIS
20-30 TRACTO

De
More

Mor

Less

Than any
approachi
and Pistor