

# STANDARD SPEEDOMETER

"THE INSTRUMENT OF PERMANENT ACCURACY"

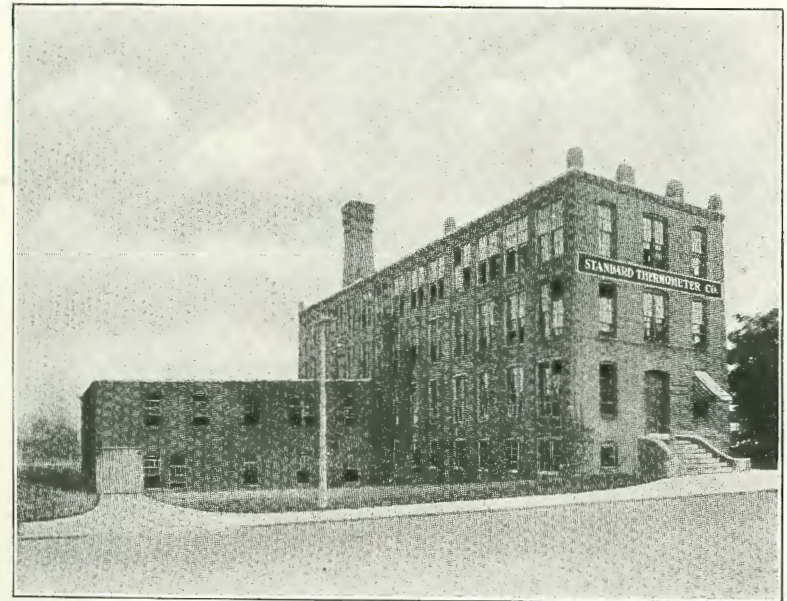
**FILE COPY**  
PATENT LIBRARY  
AMA - DETROIT  
1913  
YEAR CODE BOX



*H. Curtiz*  
*1913 Show*

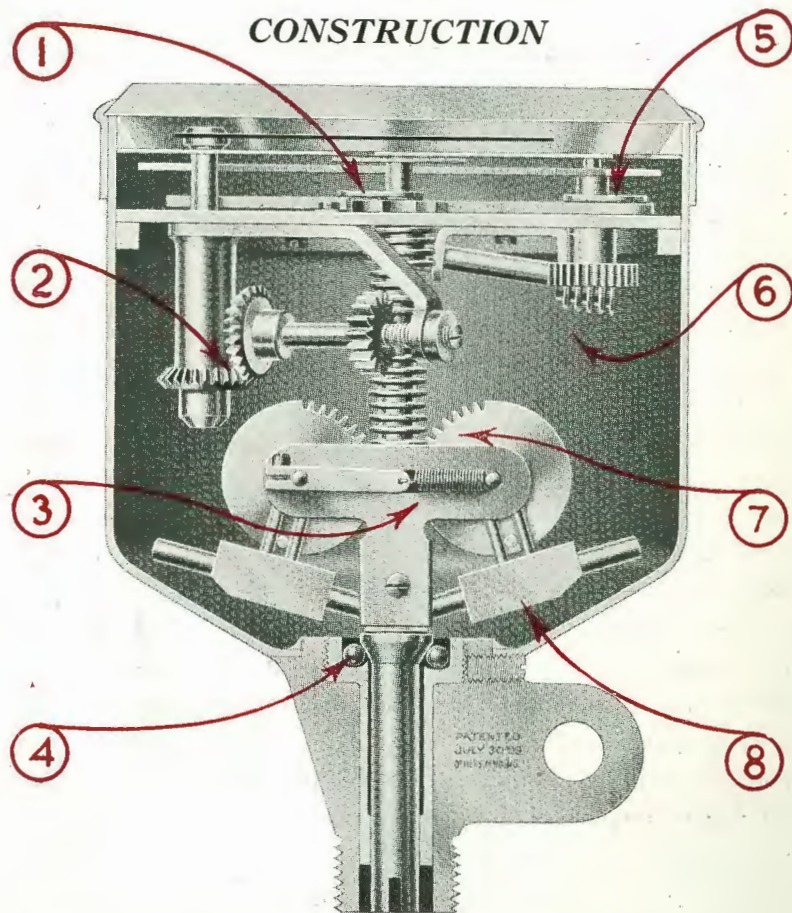
STANDARD THERMOMETER CO.  
65 SHIRLEY ST., BOSTON MASS.

**STANDARD  
SPEEDOMETERS**



*Main Office and Factory No. 1*

*Manufactured by*  
**STANDARD THERMOMETER CO.**  
*65 Shirley Street*  
**BOSTON, MASSACHUSETTS, U. S. A.**



1 The season odometer registers up to 10,000 miles and has the smallest number of moving parts possible.

2 The motion of the speed hand is imparted by positive gearing, with no spring tension in either direction, an absolute novelty, which prevents all wear and inaccuracy.

3 This spring and arrangement gives the evenly spaced dial without the use of any form of a cam or other correcting mechanism, and it does not vary.

4 By the use of hardened and polished steel ball bearings, all wear is eliminated, and 100,000 miles will not affect its accuracy.

5 The trip odometer consists of but one part, a large internal gear with 100 teeth; giving a trip record up to 100 miles; the limit of simplicity.

6 Odometer drive is by positive, double worm gearing; this is the most reliable method it is possible to employ.

7 The motion of the governor is transmitted by gears instead of by the usual lever and cam method. For this reason the Standard does not wear out.

8 The governor weights oppose each other, and are in perfect balance in every position. This is what gives the steady pointer.

## STANDARD SPEEDOMETERS

**T**HE Standard Speedometer is manufactured at Boston, Mass., by The Standard Thermometer Co. This company has a well equipped factory for speedometer work and has had thirty years of experience in manufacturing instruments requiring as great, if not greater, care than that necessary in manufacturing speedometers.

We make only one grade of speedometers and this is of the very highest class. Unlike some other manufacturers, we do not have an inferior design at one price and another design of mechanism at a higher price. We employ but one design of centrifugal governor for all of our instruments and vary our designs only in the size and style of the dial.

Every Standard Speedometer has an evenly spaced dial and is uniformly accurate and easy to read at every speed. The design of the governor which permits of this uniformly even scale is thoroughly protected by patents and is the only governor in existence that gives this result without the use of a cam or other additional complicated mechanism.

### GOVERNOR

The Standard Speedometer is of a type called centrifugal.

#### Principle

If two weights on opposite sides of an axis are rotated they tend to fly apart in a greater or less degree, depending upon the speed of rotation.

The amount of force generated is totally unaffected by weather, be it hot, cold, wet or dry.

The basic principle involved is old, its commonest application being to governors of steam engines where its absolute reliability has made its use exclusive.

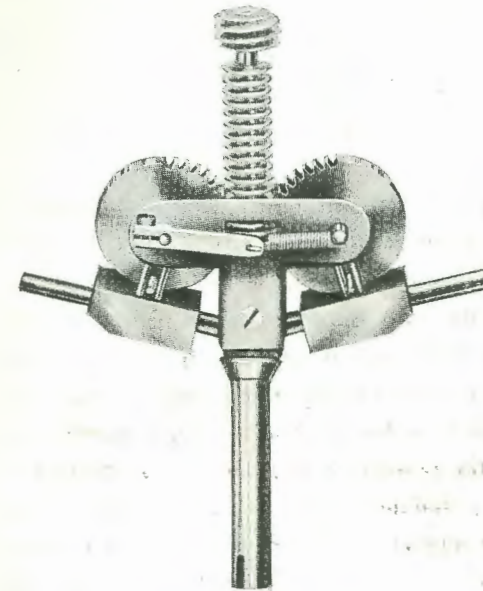
A sliding weight centrifugal governor with a counterbalancing rack is used in the Standard. This type of governor works equally well whether the speedometer is horizontal, vertical or in any other position and its operation is totally unaffected by mechanical vibration.

The design of the governor is entirely original and operates in the following manner: It revolves on ball bearings and is driven by the flexible shaft by positive gearing from the front wheel. As the speed increases the two opposing weights on the governor slide out upon the rods which support them. The two segment gears which are operated by the weights both mesh with a circular rack which slides vertically upon a spindle and transmits the motion to the pointer on the dial. The movement of the governor weights is balanced by the spring, one end of which is attached to the segment gear staff and the other end to a lever which is attached to the end of the staff on the opposing segment gear. This spring arrangement is entirely novel and combined with the arrangement of the governor weights moves the circular rack up and down on the spindle at a rate in exact proportion to the speed of the governor.

There have been a great many attempts made to make a governor which would move in exact proportion to its speed, but in no case excepting in the Standard has a speedometer been made with a governor moving the pointer over an evenly spaced dial without the use of some form of complicated cam mechanism between the governor and the pointer to correct the errors of the governor. In most other speedometers the spacing on the dial at low and high speeds is much closer than at the middle of the scale.

This governor design places the Standard Speedometer in a class by itself and in every competitive test that we have been in, the value of this feature has been clearly demonstrated.

In the improved form of Standard Speedometer we employ a centrifugal governor of entirely original design, which we call the sliding weight governor. Every other form of governor before this has been of the pivoted type, that is, the governor



*Sliding Weight Governor*

weight was mounted upon the pivot and swung around a center. The objection to this type of a governor is that it does not give a steady reading on rough roads and at all the different speeds. The sliding weight governor, of which we are the sole manufacturers, absolutely overcomes all the objections of the former type, giving a perfectly steady reading at all speeds, even

on the roughest roads and at speeds of 40 to 60 miles an hour, where most other instruments vary more or less, the Standard is perfectly steady and can be read to a fraction of a mile.

We have frequently re-tested instruments that have been run for over 100,000 miles and found them to be within 2% of absolute accuracy, which means that at a speed of 50 miles an hour the variation was less than one mile. This record, we believe has never been equalled.

All the parts of the Standard Speedometer are made on the latest type machines, some of them being automatic and built especially for this work. We have recently added materially to our already complete factory equipment, placing us in a position to handle large contracts in almost any quantities.

No expense has been spared to equip our factory with the finest machinery that is made to produce these parts correctly and we do not hesitate at any time to take any of our instruments apart and place it under the inspection of a critic.

*Odometer Construction*

The assembling is done under careful supervision and an extremely rigid inspection system after each stage of the work.

All the instruments are then subjected to a long running test and are then finally turned over to the testing department where the highest class of skilled instrument makers adjust the movements for accuracy, which consists of timing the speedometer to correspond with the odometer at various speeds.

### *Accuracy*

We maintain that the Standard Speedometer is the most accurate instrument built. The average error will not exceed one-half of one mile. This degree of accuracy is totally unaffected by temperature, weather or age.

Because of its uniform performance, more Police Departments use the Standard than any other make. Nearly all of these Police departments make a test once each week over a measured course. For their purpose a speedometer which is not invariably accurate would be absolutely worthless.

We invite every owner of a Standard Speedometer to test his instrument, after it is attached to his car, by the same method as it is tested at the factory, according to the following table:

Miles per Hour	Minutes per Mile	Miles per Hour	Minutes per Mile	Miles per Hour	Minutes per Mile	Miles per Hour	Seconds per Mile
1 — 60		21 — 2.51		41 — 1.28		61 — 59.01	
2 — 30		22 — 2.44		42 — 1.26		62 — 58.06	
3 — 20		23 — 2.36		43 — 1.24		63 — 57.3	
4 — 15		24 — 2.30		44 — 1.22		64 — 56.2	
5 — 12		25 — 2.24		45 — 1.20		65 — 55.3	
6 — 10		26 — 2.18		46 — 1.18		66 — 54.5	
7 — 8.34		27 — 2.13		47 — 1.17		67 — 53.7	
8 — 7.30		28 — 2.9		48 — 1.15		68 — 52.9	
9 — 6.40		29 — 2.4		49 — 1.13		69 — 52.1	
10 — 6		30 — 2		50 — 1.12		70 — 51.4	
11 — 5.5.27		31 — 1.56		51 — 1.10		71 — 50.7	
12 — 5		32 — 1.53		52 — 1.9		72 — 50	
13 — 4.37		33 — 1.49		53 — 1.8		73 — 49.3	
14 — 4.17		34 — 1.46		54 — 1.7		74 — 48.6	
15 — 4		35 — 1.43		55 — 1.6		75 — 48	
16 — 3.45		36 — 1.40		56 — 1.4		76 — 47.3	
17 — 3.32		37 — 1.37		57 — 1.3		77 — 46.7	
18 — 3.20		38 — 1.35		58 — 1.2		78 — 46.1	
19 — 3.9		39 — 1.32		59 — 1.1		79 — 45.5	
20 — 3		40 — 1.30		60 — 1		80 — 45	

### *Directions For Using Table*

Taking for example, a speed of twenty miles per hour: Time the tenths wheel of the odometer with a watch as it snaps from one number to another for one-half mile at this speed. This should take one minute thirty seconds or three minutes per mile. This is a direct check on the accuracy of the speed pointer and allows of a test to be made at any time at any speed by following the table which we print.

*Original and Simplified System of Driving  
Gears Giving the Exact Ratio to  
Any Size of Wheel*

On most other speedometers, the numerous sizes of gears for different makes of cars and different sizes of wheels is so confusing that it is very difficult to tell whether you have the proper sizes for a car. If these gear sizes are not exactly right, both the rate of speed and the number of miles covered will not be correct. With the system of gearing that is used in the Standard Speedometer, we overcome all this difficulty by starting from a very simple basis, driving our instrument at the rate of 1680 revolutions per mile. This is not an arbitrary speed as is the case in all other speedometers, but is the number of turns that a wheel twelve inches in diameter will make in rolling one mile. On this basis we use a pinion with twelve teeth, giving a tooth for every inch of diameter of the wheel.

The driving gear has also one tooth for every inch of the diameter of the wheel it is to be attached to, so for example, if the wheel of the machine should be twelve inches in diameter, the driving gear would have twelve teeth, giving a one to one ratio. Following this idea up to a 36-inch wheel, there will be 36 teeth in the gear for a wheel of this diameter which would give a three to one ratio. We carry in stock gears for the different sizes according to the table below:

26	31	34	38	44
28	32	35	40	48
30	33	36	42	

We are prepared to furnish promptly any other sizes that may be called for.

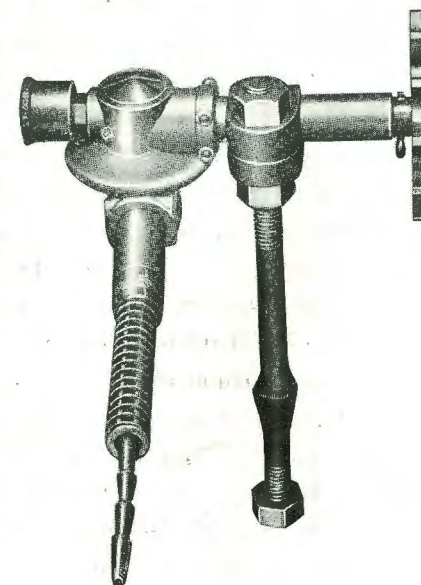
Another advantage of this system is that we use a standard gear of 5 pitch. This gives a large tooth, fully twice the size that is ordinarily used for this purpose. A very important advantage using this size gear is that it permits the practical use of a fibre pinion, giving absolute quietness to the driving gears, a feature that is much in demand at the present time where the cars

are made to run so quietly. The reader has probably often heard a car passing by where the only noise noticeable was the rattling of the speedometer gear. This cannot be entirely avoided where two metal gears run exposed, but by the use of our large tooth fibre pinion it is absolutely impossible.

The accompanying cut shows our improved pivot drive joint, with adjustment for wear. Also the universal attaching clamp that will fit any car that is built.

This joint is to prevent bending the flexible shaft at the lower end, and prolongs the life of the shaft many times.

This cut also shows the steel lined flexible tubing, and the special rivetless link shaft. This shaft is much smoother running than spiral wire shaft and easier than other link shafts.



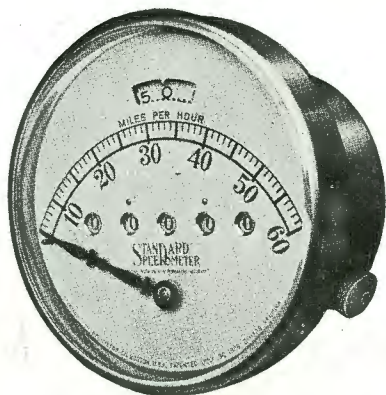
*Pivot Drive Joint*

*Quality*

The Standard Speedometer is made of the most suitable materials that can be obtained regardless of cost. A high standard of workmanship is maintained by a careful inspection system and the use of limit gauges. Special drop forging dies have been made at great expense and jigs are used in order to secure absolute uniformity and interchangeability.

*Why we do not make Magnetic Instruments*

We do not make magnetic speedometers because magnetic governors vary with hot, cold, wet or dry weather and in addition magnets lose strength with age and the instruments become even more inaccurate. The U. S. Government in an official report states that the error of a magnetic instrument between the highest and lowest temperatures in a season is as high as 28%.



**4 Inch 60 Mile**

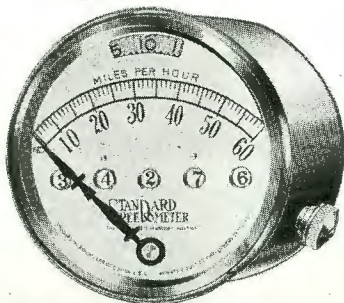
With Trip and Total Mileage. Complete with Shaft and Fittings.  
\$35.00.

80 Mile Dial, \$40.00.

Large scale, easily read from front and rear seats.

Regular finish Nickel.

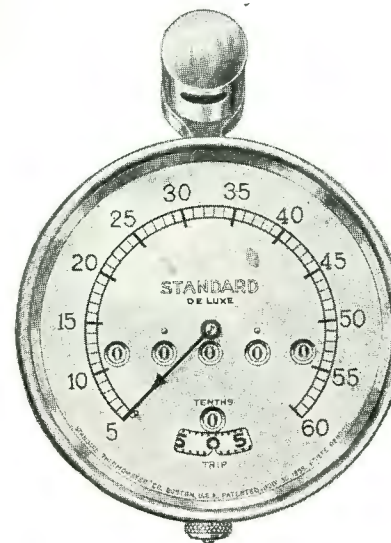
Brass, Black Enameled or Oxidized Nickel optional at the same price.



**3 Inch 60 Mile**

With Trip and Total Mileage. Complete with Shaft and Fittings.  
\$25.00.

This model varies only in size from the regular four inch model. It can be had in any finish and is of the same high quality throughout.



**Model 43**

De Luxe.

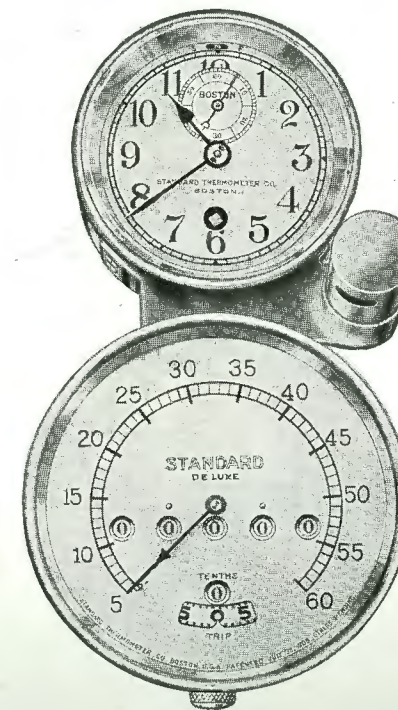
4" Dial and Long Scale.

Electric Light.

Total and Trip Odometer.

Trip Odometer can be Reset to any Tenth of a Mile.

Complete with Fittings.  
\$50.00.



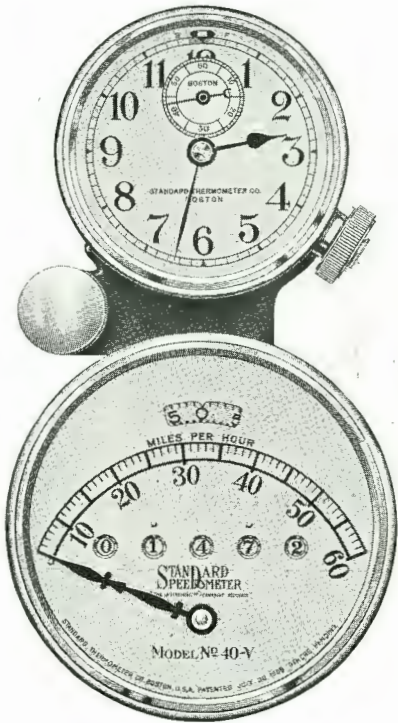
**Model 44**

Same as Model 43, but with Clock added.

Complete with Fittings.

With Boston Clock,  
\$75.00.

With Chelsea Clock,  
\$85.00.



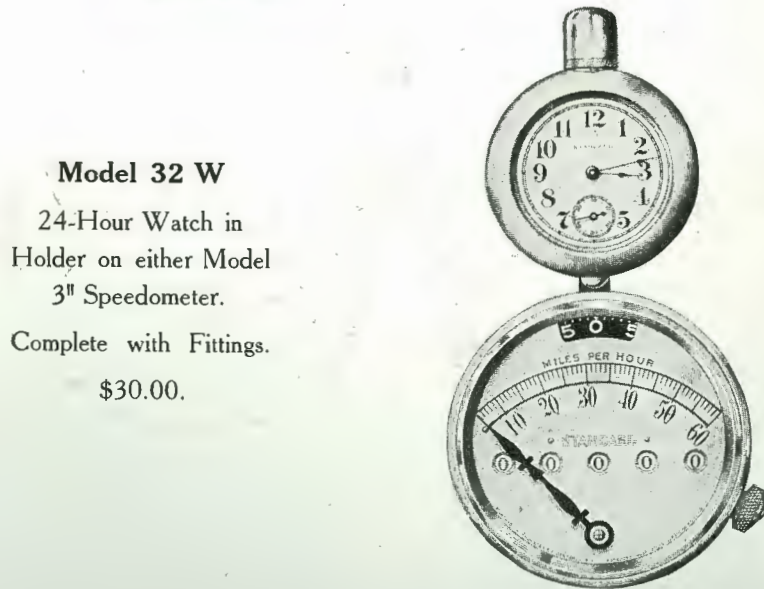
**Model 40 V**

4" Speedometer,  
3" Clock.

Complete with Fittings.

With Boston Clock,  
\$65.00.

With Chelsea Clock,  
\$75.00

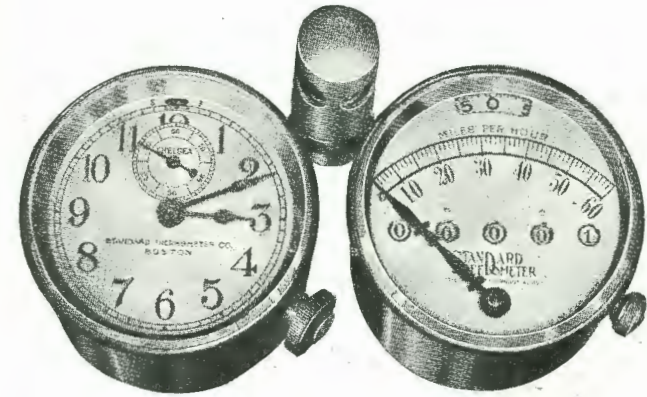


**Model 32 W**

24-Hour Watch in  
Holder on either Model  
3" Speedometer.

Complete with Fittings.

\$30.00.



**3 Inch 60 Mile Clock Set with Electric Light**

Boston Clock \$55.00.

Chelsea Clock \$65.00.



**4 Inch 80 Mile Clock Set with Electric Light**

Boston Clock \$70.00.

Chelsea Clock \$80.00.



**PRICE LIST OF PARTS**

*Auto Speedometers*

173 Split Clamp . . \$ .75	181 Dash Bracket . . 1.00
174 Fibre Pinion . . .75	182 Dash Bracket . . 1.00
175 Pivot Joint . . 5.00	183 Dash Bracket . . 1.00
175A Pivot Bolt and Nut .25	3" Bezels with glasses . . .75
175B Double Mitre Gear .50	4" Bezels with glasses . . 1.00
175C Short Spindle and Gear . . . . .50	Flexible Tube, per ft. . . .40
175D Long Spindle and Gear . . . . .50	Flexible Shaft, per ft. . . .50
176 Knuckle Clamp . 1.00	(State whether cylindrical or conical link shafting)
176A Knuckle Rod . . .50	Plain Bearing Flexible Shaft Couplings . . . . .20
176B Knuckle Rod . . .50	Ball Bearing Flexible Shaft Couplings . . . . .40
177 Driving Gear . . 1.50	Plain Bearing Flexible Tube Union . . . .40
178 Dash Bracket . . 1.00	Ball Bearing Flexible Tube Union . . . .40
179 Dash Bracket . . 1.00	
180 Dash Bracket . . 1.00	

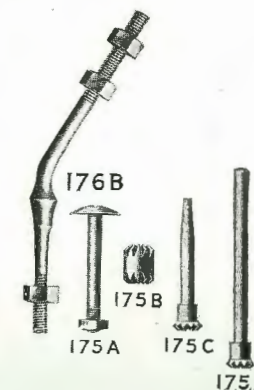
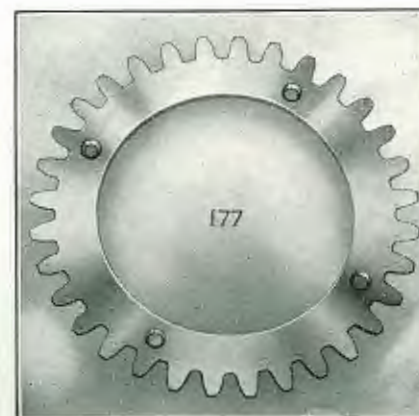
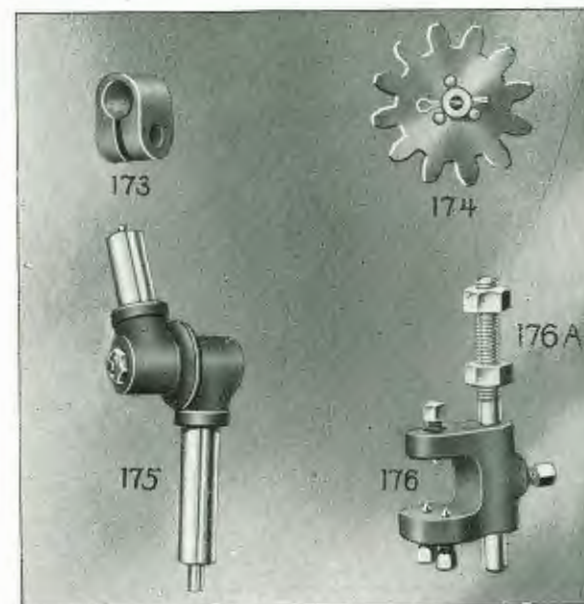
*Shafts*

Complete Shafts are composed of the Flexible Shaft, Flexible Tube with end connections, and the Pivot Joint and Fibre Gear.

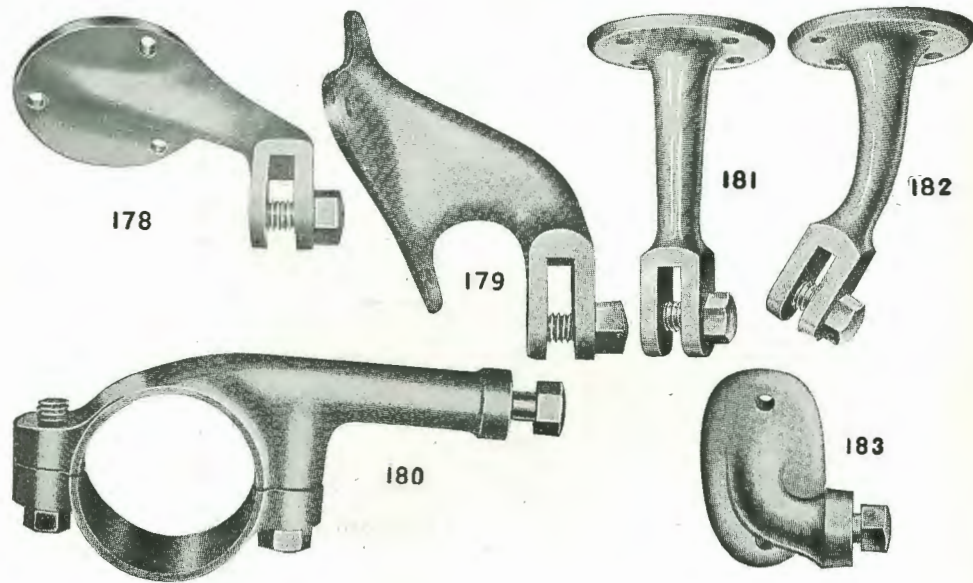
Price, for any length not over six feet, . . . \$9.00.

	54"	56"	60"	66"	72"
Flexible Tubes with ball bearing end connections	\$2.40	\$2.46	\$2.60	\$2.80	\$3.00
Flexible Tubes with plain bearing end connections	2.20	2.26	2.40	2.60	2.80
Flexible Shafts with ball bearing end connections	2.65	2.72	2.90	3.15	3.40
Flexible Shafts with plain bearing end connections	2.45	2.53	2.70	2.95	3.20

In ordering parts state the make, year and model of the car.  
Transportation charges additional to the above prices.



State size of tire when ordering driving gears.



**WE GUARANTEE**

For one year Standard Speedometers against all mechanical defects. Should any defect due to workmanship or material develop in the instrument it will be repaired free of charge if returned to the factory, carriage prepaid. If accidentally broken, repairs will be made at a minimum expense if returned to the factory, carriage prepaid.

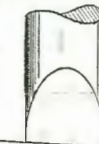
**PRICE LIST**

40	MODEL NO. 30	} \$25.00
3" 50	" " 31	
60	" " 32	
80	" " 33	\$30.00
40	" " 30-W	} Vertical Watch Set
3" 50	" " 31-W	
60	" " 32-W	
80	" " 33-W	\$35.00
40	" " 30-C	} Vertical or Horizontal Boston Clock Set
3" 50	" " 31-C	
60	" " 32-C	
80	" " 33-C	\$60.00
60	MODEL NO. 40	\$35.00
4" 80	" " 41	\$40.00
100	" " 42	\$50.00
60	" " 40-V	} Vertical Clock Set 3" Boston Clock Electric Light Chelsea \$10.00 Extra
4" 80	" " 41-V	
100	" " 42-V	
60	" " 40-H	} Horizontal Clock Set 4" Boston Clock Electric Light Chelsea \$10.00 Extra
4" 80	" " 41-H	
100	" " 42-H	
4" 60	" " 43	\$50.00
4" 60	" " 44	\$75.00 Boston Clock } "De Luxe" Model with \$85.00 Chelsea Clock } Clock and Electric Light

Directions for repairing flexible shaft on Standard Speedometer. Repair links for this purpose may be had on application to the Standard Thermometer Co., 65 Shirley Street, Boston, Mass.

**NOTE**

The flexible shaft should be about one link per foot longer than the tubing in which it runs.



Use sharp cold chisel about 1/4" wide to open up the link to be disconnected.



Links should be opened like this—without bending tongues.



To connect shaft, close up this link with pliers into its original round form.

## Standard Motorcycle Speedometers

These instruments are of such construction that they easily stand the severe shocks they are subject to on motorcycles.

The method of attaching is the most practical one in use.

The fittings are neat and substantial and are designed for hard usage.

We can fit any standard make of motorcycle with our instruments.

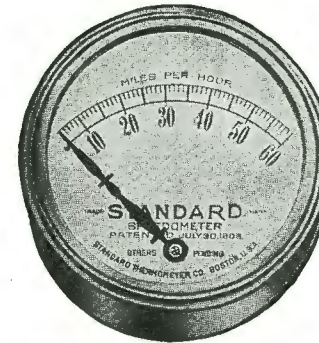


### Method of Driving

Our method of driving the speedometer from the front wheel of spring fork motorcycles is the only practical one in use. Being patented, the use of infringing devices is absolutely prohibited.

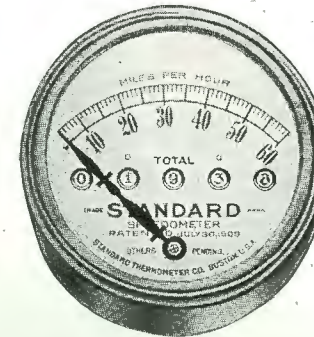
Special long axles are supplied for motorcycles requiring swivel fittings which permits the use of large swivel bearings. This insures that the fittings will remain tight after long usage.

### No. 1

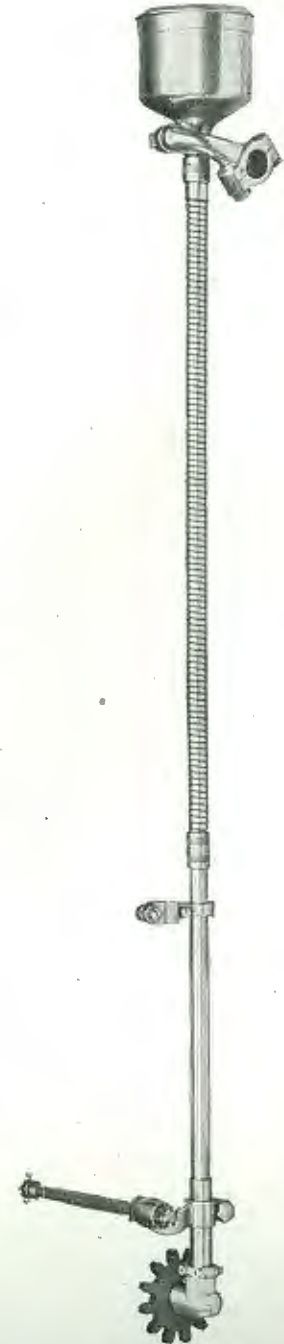


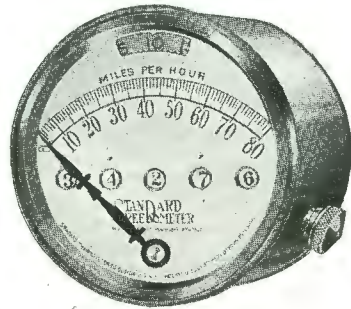
3 Inch, 60 Mile or 80 Mile Dial.  
Complete with Shaft and Fittings.  
\$12.00.

### No. 2



3 Inch 60 Mile or 80 Mile Dial,  
Season Odometer Only.  
Complete with Shaft and Fittings.  
\$14.50.





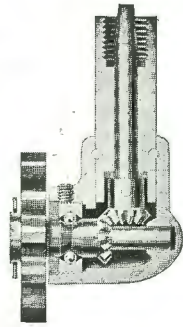
**No. 3**

3 Inch, 60 Mile or 80 Mile Dial,  
10,000 Mile Season and 100  
Mile Trip Odometer.

Complete with Shaft and Fittings.

\$16.00.

A rigid tube is fastened to the axle by a drop forged arm which pivots upon a steel bearing. The tube has a reciprocating motion, due to the action of the spring fork, and is held in a position at its upper end by a guide which is clamped to the fork. A driving gear is clamped to the spokes of the motorcycle which meshes with a fibre pinion which is attached to a spindle which projects from a ball-bearing bevel joint.



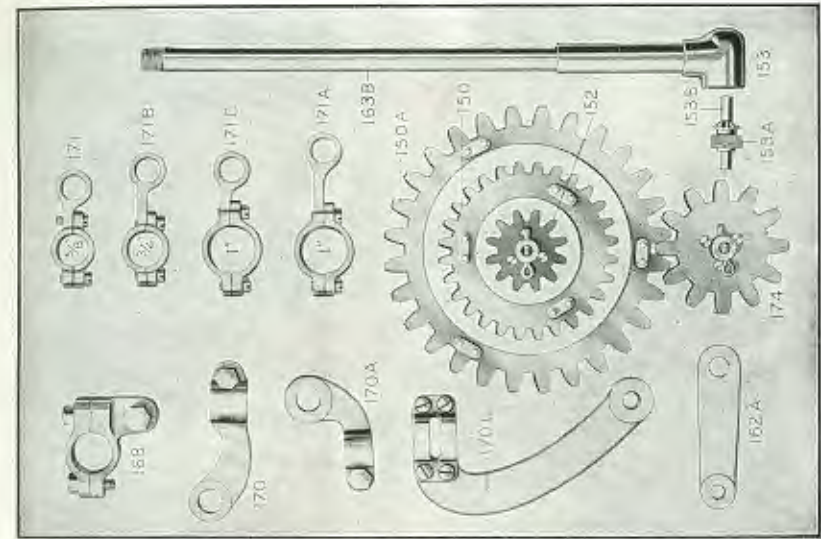
*Ball-Bearing Joint*

From the top of this tube to the speedometer head we use a flexible tube made of a special rolled steel stock which is practically unbreakable, being from six to ten times stronger than anything of its kind ever before manufactured. This tubing is patented by us and is made in our own factory. You cannot obtain this valuable feature in any speedometer except the Standard.

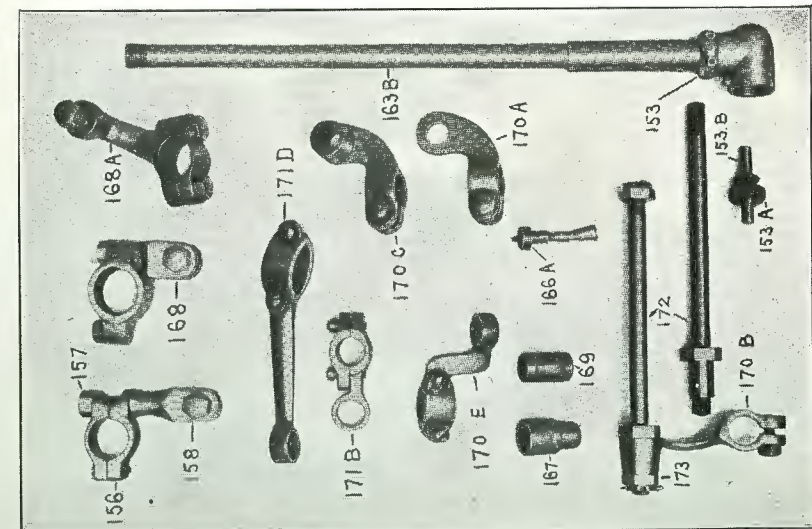
Our flexible shaft rotated in the flexible tube is made of steel links. In case of accidental breakage the repairs can be easily made by the rider.

We can furnish fittings for any standard motorcycle.

Our patented front drive only registers mileage when the machine is actually moving. It is in a protected position, also the Speedometer may be placed above or below the handle bar. It incorporates every good feature of driving mechanism with none of the bad features.



**SPECIAL  
FITTINGS**



## Abell Ball Bearing Pumps

Three Cylinders



Patents Pending

**FOR TIRES**

AIR COOLED

WATER COOLED

Guaranteed for One Year

In designing the Abell three cylinder tire pump, four most important features were considered: Efficiency, Weight, Size and Durability.

### Efficiency

Various tests have been made which prove that the Abell Pump will inflate a tire in from 15 to 80% less time than any pump that it has been in competition with.

As to weight and size, it is at least 25% lighter than any three or four cylinder pump on the market, its weight being but six pounds, and is 33½% smaller, permitting of an installation in many instances where heretofore it has been impossible to install any pump.

### Durability

The Abell Pump is the only one in which all the revolving parts are ball bearing. They are built to last a lifetime. The main shaft and driving gears are made of steel and hardened. The connecting rods are drop forgings and case hardened. It is built as well as a gas engine.

In the construction of the Abell pump several distinct improvements have been made to insure long life and efficiency.

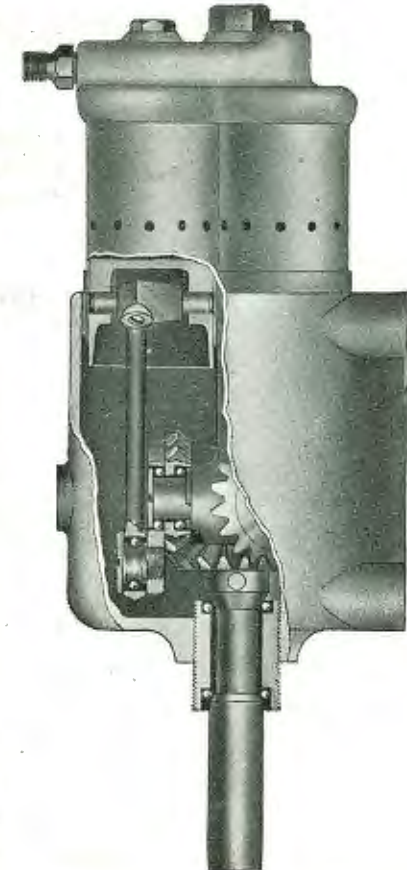
All parts are made with greater care and accuracy than has usually been employed in the manufacture of any tire pump and in addition to this we have added ball bearings at the four vital points, making it practically indestructible even though it runs without lubrication.

This exclusive ball bearing feature eliminates the need of fluid lubrication and necessarily prevents oil vapor from getting into the tire and destroying the inner tube, as has been the case in other tire pumps.

Great care is used in making the pistons fit closely, positively preventing any leakage of air.

The Abell tire pump can be run as fast as **500 R. P. M.** and at this speed will pump a **34x4** tire to **75** lbs. pressure in about **60** seconds.

The method of attaching this pump varies somewhat with the design of the car. The illustration on next page shows one method of attaching to the pump shaft under the hood. We can also furnish attachments for driving the tire pump from the front or rear of the gear box according to the design of the car.



Sectional view, showing main shaft crank stud and connecting rod Ball Bearings. This is the only pump that does not require oil. Oil works by pistons in other pumps and rots inner tubes.

### *The Abell Portable Garage Pump*

This plant consists of an Abell three cylinder tire pump driven by  $\frac{1}{4}$  H. P. electric motor (for either direct or alternating currents).



Portable Garage Outfit, complete, ready to attach to a lamp socket. Weight, about 50 pounds. Either direct or alternating current motors. Guaranteed for one year. The most complete and compact outfit on the market, complete with gauge, rubber tube, wire cord and switch.

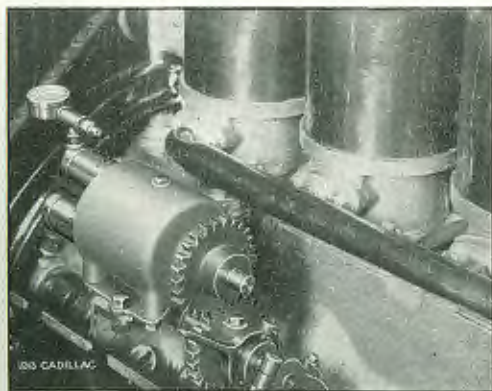
The pump is mounted on an aluminum casting which is fastened to the top of the motor and has a handle to carry it by. Reels are furnished to hold both wire cord and air tube.

These pumps are waterjacketed and have a cooling reservoir, circulation being by thermo-syphon system.

This arrangement is suitable for a small garage. It is compact, taking up but slightly more than one square foot of floor space.

It is also indispensable in the largest of garages, even where an air tank is already installed, as this pump is always ready for use when the air tank pressure is insufficient, as it very often is, and it can be taken to the car in places where the tank pressure does not reach.

A 34x4 tire can be inflated to 80 lbs. pressure in two minutes by the watch.



*Pump attached to Cadillac*

### *Prices of Pumps*

Pump with hose and gauge only, \$25.00

Pump with hose, gauge and fittings for attaching to a car, \$30.00

Water Cooled Garage Pumps, direct or alternating current, \$100.00