

AF

# STANDARD SPEEDOMETER

"THE INSTRUMENT OF  
PERMANENT ACCURACY"

1910



## SOME FACTS

Concerning its Mechanism  
and Manufacture, with  
Proofs of its Value  
for Accuracy and  
Durability

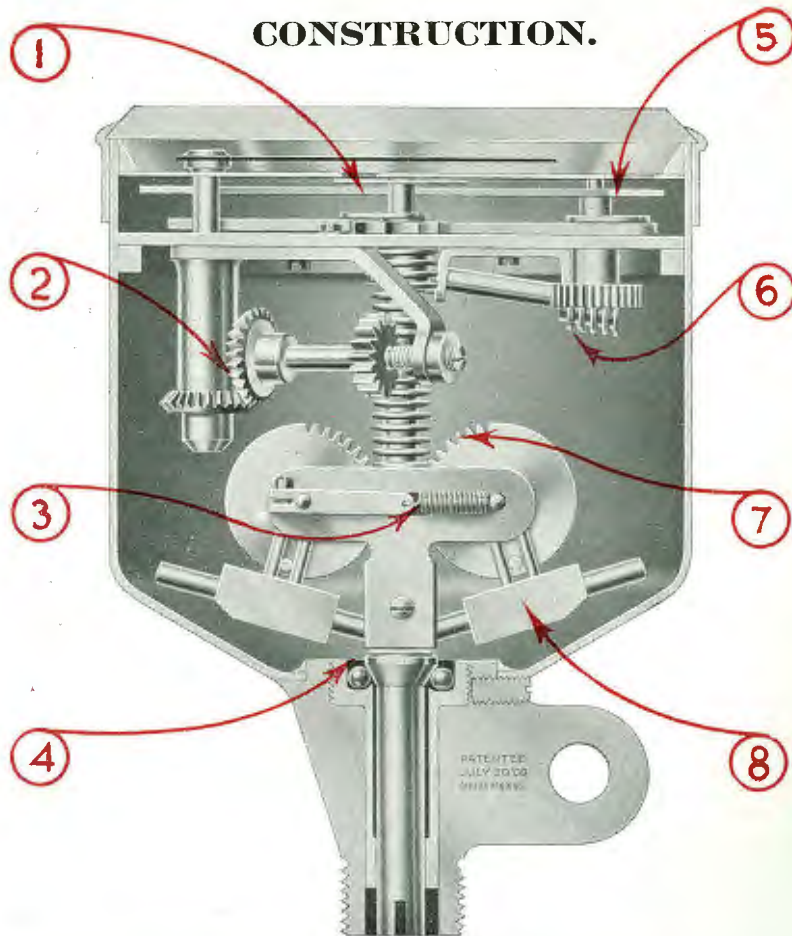
THE HOME OF THE  
**STANDARD  
SPEEDOMETERS**



Main Office and Factory No. 1.

MANUFACTURED BY  
**STANDARD THERMOMETER CO.**  
65 SHIRLEY STREET  
BOSTON, MASSACHUSETTS, U. S. A.



**CONSTRUCTION.**

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 give 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**

In offering the 1911 line of Standard Speedometers we are entering into our fourth season of their manufacture. The Standard Thermometer Company has been established for more than a quarter of a century making thermometers, thermostats and various other instruments requiring fine workmanship and accurate adjustments.

We operate three different factories, two in Boston and one in Amesbury, Mass. We have equipment for making small and accurate work that would be hard to improve upon. Practically every part of the Standard Speedometer is manufactured in our own plant and the variety of different machine tools required in the manufacture includes everything from the heavy presses weighing several tons each, down to precision bench lathes and automatic gear and pinion cutters, and we think it is safe to say that no one engaged in the manufacture of speedometers has a more complete equipment.

The success of any manufactured article depends upon the amount of care and attention given to the small details and this cannot be done properly unless the entire manufacture of an article is controlled from one source. Our factory equipment consisting of over \$150,000.00 worth of tools gives us the best possible facilities for turning out the very best work in quantities.

The design of the Standard Speedometer is entirely original. We have copied no one but have produced the result that has been attempted unsuccessfully by other manufacturers. We do not know of another instance where the desired result has been accomplished. We refer to the governor mechanism which gives an evenly spaced dial without the use of complicated and impractical cam mechanisms.

While this feature may seem to be unimportant at the first glance, it is actually of vital importance. It means that when a speed dial shows finer spacing at one point than at another that



the designer did not have perfect control of the elements which he was dealing with and that instead of getting the result that was desired he was willing to compromise on the nearest approach that he could get to that result. In other words, he could not produce what he was striving for even in his first sample and so it would not be natural to expect a good reproduction of the working sample which in itself was not correct.

There is nothing of this compromise in the Standard Speedometer. The spacing on the dial of every speedometer that we manufacture is even, the pointer moves exactly the same distance for every mile.

In producing the governor we have also accomplished another equally as important result, that can be found in no other speedometer. The friction between the governor and indicating mechanism is eliminated by dispensing with a spring on the speed pointer. In most speedometers there is a spring of some form to return the speed hand to zero, but on the Standard there is no such spring, the hand is moved ahead by the action of the governor weights and it is returned by the same action through gearing. This feature is not only original with us but is absolutely essential to permanent accuracy.

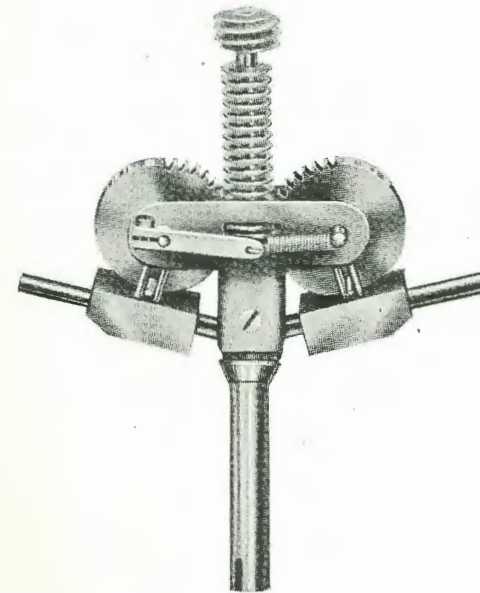
Should we use a spring on our pointer as is done in every other instrument we could not claim to have a more accurate instrument. It will be easily understood that where there is a spring pressure between the stationary and revolving mechanism producing a constant pressure and friction at this point that the wear and tear caused by this friction makes an error. In the course of 5,000 miles running it is a common occurrence for this spring pressure to cause an error of more than five miles per hour from the speed that it originally indicated.

We guarantee the Standard Speedometers not to vary more than one mile after 10,000 miles running, and on several tests that have been made the error has not exceeded one mile even when the speed has been run upward to 100,000 miles. This is why we call it the instrument of Permanent Accuracy.

### Details of Construction.

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

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



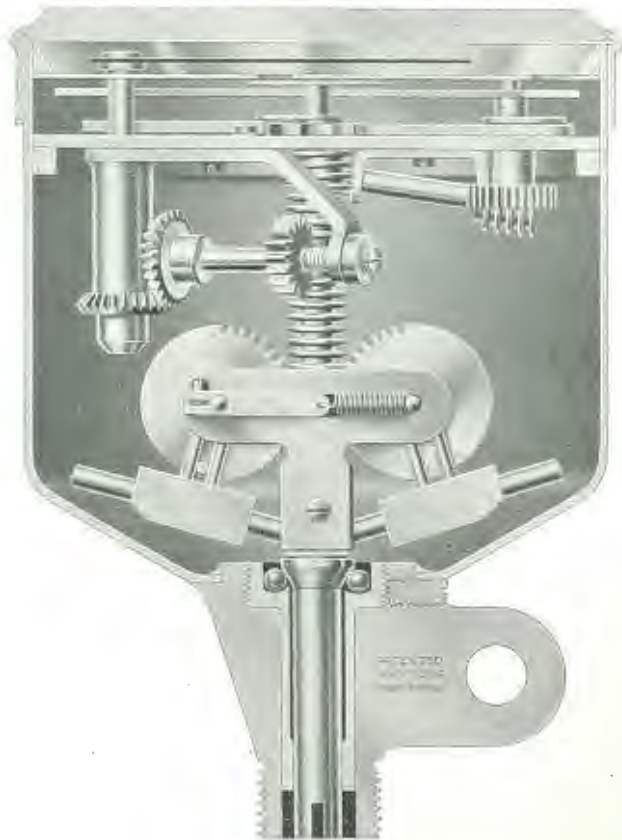
Sliding Weight Governor.

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.

By referring to the sectional view of the instrument it will be noted that there are two weights which slide on rods in a straight line and one being opposed to the other keeps them in perfect balance in any position. The weight of the circular rack is balanced by the angle of the rods on which the weights slide. Any one familiar with an automobile can realize the intense vibration on the dash board at speeds of over 30 miles per

hour, but this vibration does not affect the operation or steady running of our instrument.

Another distinctive feature of the Standard Speedometer is the absence of a spring of any sort on the speed pointer mechanism. On every other instrument there is a spring of some kind



Sectional View of Speedometer Construction.

to return the indicating mechanism to zero. The actuating means in other instruments, whatever it may be, forces the indicating means up the scale and a spring is used to return it. This is the cause of most of the wear and inaccuracy in other makes and this feature is not present in the Standard.

By again referring to the sectional view it will be noted that the connection from the governor to the pointer is entirely through gearing. The governor in advancing with speed carries the hand ahead by a direct connection through the gears. If the speedometer were running at any one speed continually there would be absolutely no pressure or friction between the revolving and stationary parts on account of the fact that there is no spring pressure to produce it. As the speed is reduced the governor weights return to their original position, carrying the hand back through the gear connection positively and with the least possible amount of friction. On account of this feature we call the Standard Speedometer the instrument of permanent accuracy and no one has ever disputed the advantage of this construction.

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.



Odometer Construction.



The Standard is the only speedometer that is positively connected from the wheels to the pointer by an accurate system of gears. By this we mean that beginning from the driving gears on the wheel the connection to the speed pointer is entirely through gearing and there is no possibility of the speed pointer varying from the actual speed of the wheel as is possible in other constructions where cams or other delicate lever connections are used.

### Details of Manufacture.

All the parts in this instrument are made from solid stock with accurately cut teeth like those of a fine watch. None of these parts are made of sheet metal stampings or brittle castings, as is the practice with some manufacturers.



Assembling Room in Factory No. 2.

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.

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.

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	55.27	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 on page 9, 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.

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### **Centrifugal Governor Speedometer More Accurate Than Magnetic Type.**

#### **U. S. GOVERNMENT REPORT.**

In choosing a speedometer the first consideration, of course, is that of accuracy, not only when the instrument is new, but permanent accuracy. There has been, for several years, a very keen competition between the manufacturers of the centrifugal governor and magnetic types. Public opinion has been pretty evenly divided between these two types which naturally followed on account of the very active advertising campaigns that have been carried on.

The manufacturers of the centrifugal type have always claimed that the magnetic instruments were affected to an appreciable amount by a variation in temperature. This has been disputed by the manufacturers of the magnetic instruments, but the question has been finally settled by the Bureau of Standards, which comes under the U. S. Government. The Bureau of Standards has published a statement which has been very widely used by the daily press and trades papers all over the country, the essence of which is that the magnetic instrument has been condemned by the government on account of inaccuracies due to variations in temperature.

The magnetic instruments show a variation during hot and cold weather of **twenty-eight per cent.** Dr. Stratton, head of

the Department of Standards, is quoted as making the following statement: "The inaccuracy is the same as though a clock which one depends upon to keep an appointment at four o'clock varied to such an extent that at that hour it would give the time as three or five o'clock, depending upon whether the temperature was hot or cold."

This has been known for some time and there has always been more or less argument over it, but the report from one of the U. S. Government departments finally decided this question so there is no further chance of argument. All magnetic instruments are doomed.

The effect of temperature on the Standard does not exceed two per cent.

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### **The Best Type of Centrifugal Governor.**

The question now comes up, which is the best centrifugal governor instrument, and by comparing the Standard with the other types of centrifugals it will be found that there is one distinct difference that makes the Standard the speedometer of "Permanent Accuracy." This feature is the absence of any form of spring to return the hand to zero and also to produce friction between the revolving and stationary mechanisms.

There is no other speedometer made without a spring of some form on the speed pointer mechanism to return the hand to the zero point which at the same time produces a constant friction at the point of contact with the revolving governor so that it is only a matter of time when inaccuracies will be produced at this point. Errors from this source run as high as 20% in many cases within a few thousand miles.

By referring to the sectional cut of the Standard it will be seen that the connection between the governor and the indicating mechanism is by a rack and pinion, the rack revolving in mesh with the pinion without any spring pressure.



The Standard could run at a speed of 60 miles per hour indefinitely without producing the least amount of wear at this vital point.

We have the exclusive use of this construction and we make the positive statement that after 100,000 miles of use the Standard will not vary more than 2%.

We make strong claims for the permanent accuracy of the Standard Speedometer.

Without doubt the most complete test ever made on speedometers was made on six of the most prominent makes of speedometers during the past season by the Cadillac Motor Car Co., Detroit, Mich.

- 1st. This consisted of an initial test for accuracy at different speeds.
- 2d. The same test under a temperature variation of 80° Fahrenheit.
- 3d. A vibration test to note the steadiness of the reading.
- 4th. A run of about 4000 miles under extreme vibration to develop any weakness and wear that might occur.
- 5th. A final test for accuracy to determine the change produced by this amount of service.
- 6th. An inspection of the interior mechanism to note the wear of the parts. (This not only included the instrument itself, but the driving gears and flexible shaft connections.)

The Standard proved superior in this most severe test over the five other makes with which it was in competition and at a conference of the executive officers of the Cadillac Motor Car Company, it was decided to adopt the Standard Speedometer as the regular equipment for 1911.

The following are some of the Police Departments that are now using the Standard Speedometer and in many instances having replaced instruments of other makes:

Metropolitan Park Police, Boston	Newark, N. J. Police Department
Lincoln Park Police, Chicago	Kansas City, Mo. " "
St. Louis, Mo. Police Department	Pawtucket, R. I. " "
Baltimore, Md. " "	Massillon, O. " "
Buffalo, N. Y. " "	Norfolk, Va. " "
Detroit, Mich. " "	Yonkers, N. Y. " "
Troy, N. Y. Police Department.	

#### **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	

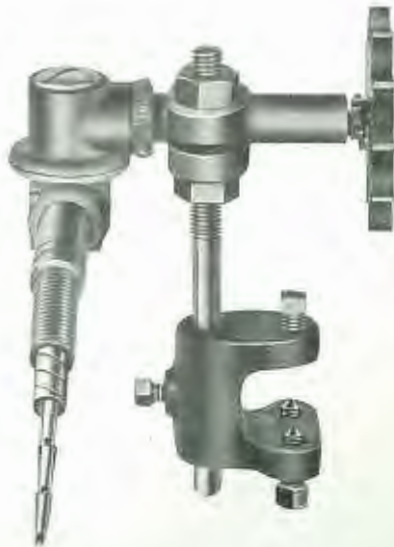
We are prepared to furnish promptly any other sizes that may be called for.

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 are 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.



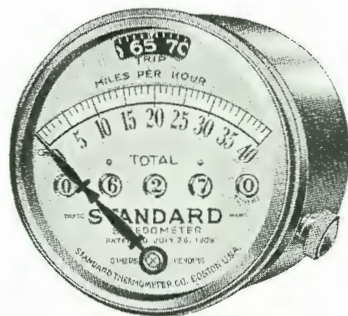
Pivot Drive Joint.



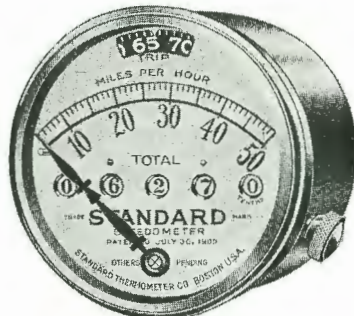
**3 Inch 60 Mile Clock Set with Electric Light.**  
 Boston Clock \$50.00. Chelsea Clock \$60.00.



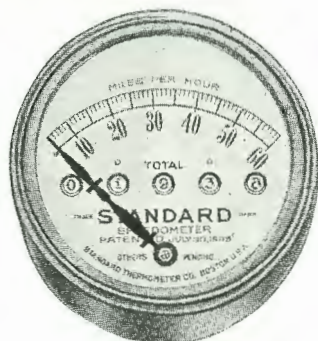
**4 Inch 60 Mile Clock Set with Electric Light.**  
 Boston Clock \$70.00. Chelsea Clock \$80.00.



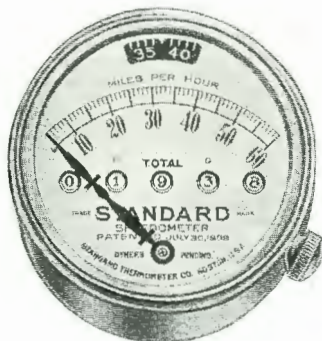
**3 Inch 40 Mile.  
Trip and Total Mileage.  
\$25.00.**



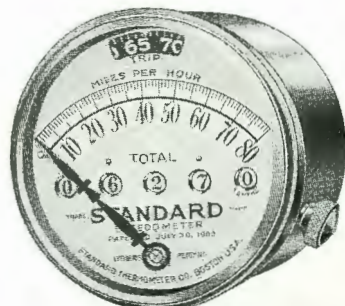
**3 Inch 50 Mile.  
Trip and Total Mileage.  
\$25.00.**



**3 Inch 60 mile.  
Total Mileage Only.  
\$20.00.**



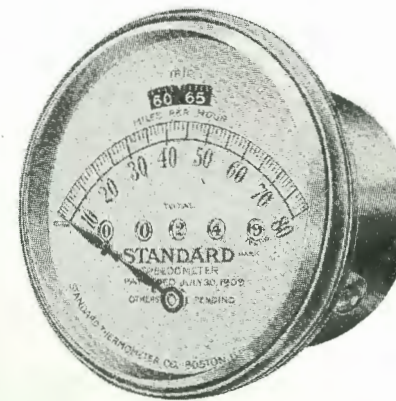
**3 Inch 60 Mile.  
Trip and Total Mileage.  
\$25.00.**



**3 Inch 80 Mile.  
Trip and Total Mileage.  
\$30.00.**

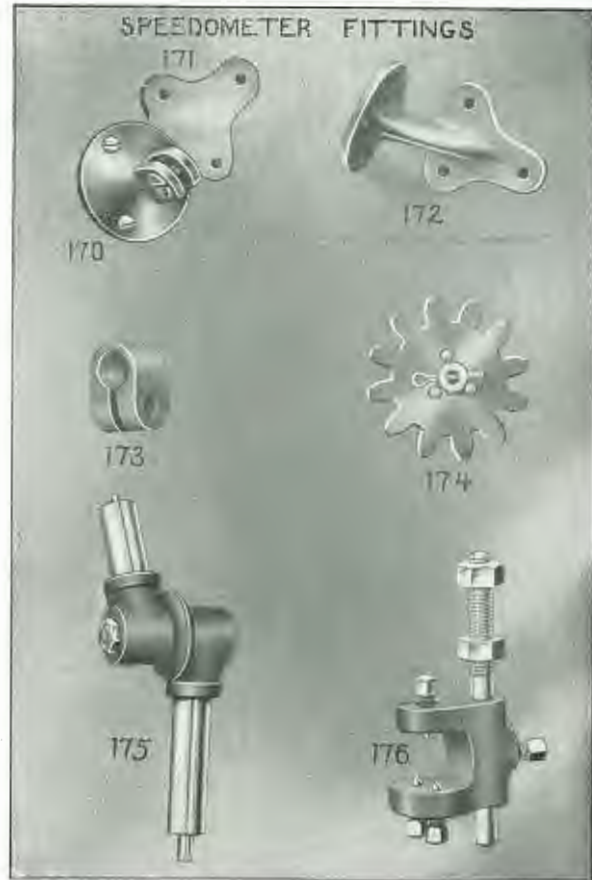


**4 Inch 60 Mile.  
With Trip and Total Mileage.  
\$35.00.**

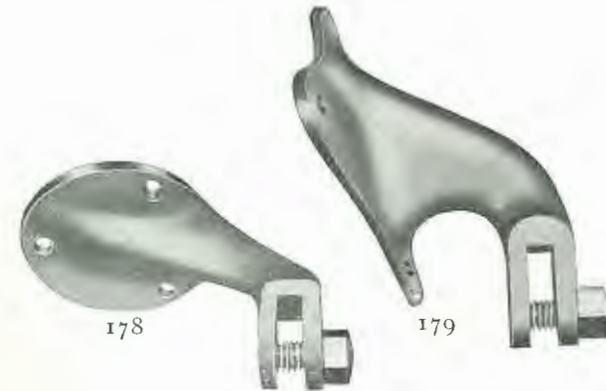
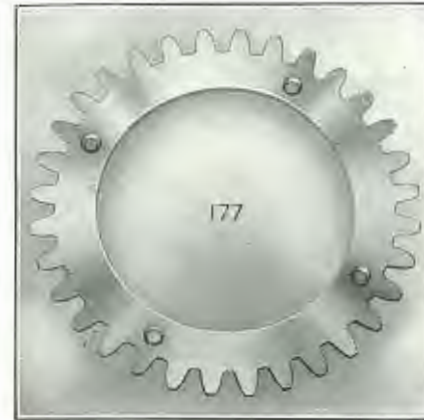


**4 Inch 80 mile.  
With Trip and Total Mileage.  
\$40.00.**



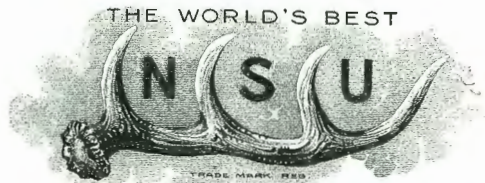


170	Plain Dash Bracket . . . . .	\$1.00
171	Flat Dash Extension . . . . .	.75
172	Curved Dash Extension . . . . .	1.00
173	Split Clamp . . . . .	.75
174	Fibre Pinion . . . . .	.75
175	Pivot Drive . . . . .	5.00
176	Knuckle Clamp . . . . .	1.50
177	Large Driving Gear . . . . .	1.50
178	Offset Dash Bracket . . . . .	1.00
169	Curved Dash Bracket . . . . .	1.00
180	Steering Column Bracket . . . . .	1.00
	Flexible Brass Tube, per foot . . . . .	.40
	Flexible Shaft, per foot . . . . .	.50



REPRESENTATIVES IN ALL THE LARGER CITIES OF THE UNITED STATES

MANUFACTURERS OF THE  
FAMOUS N. S. U.  
MOTORCYCLES  
DELIVERY VANS  
TRICARS  
MOTORS AND  
THEIR COMPONENTS



THE N.S.U. MOTOR COMPANY

TELEPHONE, 9759 RIVERSIDE  
TELEGRAPH AND CABLE  
ENESUCO, N. Y.

MEMBERS OF THE MOTORCYCLE  
MANUFACTURERS' ASSOCIATION

*New York*  
206 West 76th Street (Near Broadway)  
July 26, 1910.

The Standard Thermometer Co.,  
Boston, Mass.

Gentlemen:-

Your favor of the 20th inst. at hand, and we take pleasure in informing you that in not one instance have we received any complaint from purchasers of your Standard Speedometers.

They have been found to be absolutely correct, and have not deteriorated in any instance whatsoever, from wear.

Very truly yours,

*Chas. A. Doolittle*



Cadillac Motor Car Company

SUCCESSORS TO  
CADILLAC AUTOMOBILE CO. & LELAND & FAULKNER MFG. CO.  
CHRYSLER BUILDING  
200 WEST 42ND STREET  
NEW YORK, N. Y.  
DETROIT, MICHIGAN  
U. S. A.

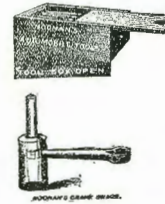
7/15/10

Standard Thermometer Company,  
Boston,  
Mass.  
Gentlemen:-

We have decided, after making some very extensive tests on six different makes of speedometers to place our contract with you for our 1911 standard equipment.

Very truly yours,  
CADILLAC MOTOR CAR COMPANY  
*Chas. A. Doolittle*  
Purchasing Agent.

CO. M.F.F.



A. S. NOONAN TOOL  
AND MACHINE WORKS

Manufacturer of

NOONAN'S REPAIR TOOLS

LIGHT MACHINERY, TOOLS AND NOVELTIES



Rome, N. Y., U. S. A. 7/18/1910.

The Standard Thermometer Co.,  
Boston, Mass.

Gentlemen:  
Enclosed find our order #260 for speedometer.

Kindly give us your very best price, also send us your catalogue. Now if you can make us the right price, we can sell a great many of your speedometers.

All of our men's machines are equipped with your instrument, and are giving perfect satisfaction.

Very truly yours,  
A. S. Noonan,

*A. S. Noonan*



NEAL, CLARK & NEAL CO.  
643-645 MAIN STREET  
BUFFALO, N. Y.

July 27, 1910.

Standard Thermometer Co.,

65 Shirley St.,

Boston, Mass.

Gentlemen:-

We have used your Standard Speedometers almost exclusively this year and it pleases us to say that we have received from same, most satisfactory results. The instruments have recorded the rate of speed and the mileage with the greatest accuracy, and our customers are most enthusiastic over same.

Yours very respectfully,

NEAL, CLARK & NEAL CO.

OJN-RS.



*Showbagan Me July 14<sup>th</sup> 1910*  
*Standard Thermometer Co.*  
*Boston Mass.*

*Enclosed find money  
 order for \$15.00 in payment for  
 speedometer which I find very  
 satisfactory -*

*Yours very truly*  
*Fred C. Cooper*



Largest Explosive Motorcycle Plant in the World

### AMERICAN MOTOR COMPANY

INCORPORATED

Member of the Motorcycle Manufacturers Association.

No Orders Taken  
Without a Deposit



Cable Address:  
"Motor" Brockton

### MOTORCYCLES

BROCKTON MASS, U. S. A.

July  
twenty second  
1910.

RECEIVED

JUL 28 1910

ANSWERED

Standard Thermometer Company,  
Boston, Mass.

Gentlemen:

We take pleasure in stating that the Standard speedometers purchased from you this year have given us excellent satisfaction, and we consider there is no better instrument made.

Yours very truly,

AMERICAN MOTOR COMPANY

*W. J. Mavak* MGR.  
M.

Elyria, Ohio, July 28, 1910.

The Standard Thermometer Co.,  
Boston, Mass.

Gentlemen:—

I have used this speedometer for two seasons and I have found it to be the most satisfactory speedometer that I have ever had on the machine. I am able to make this statement because I have used the W— and the J— and have always had trouble with them but this little instrument has certainly given perfect satisfaction.

Very truly yours,

G. C. WORTHINGTON.

G. C. W.—S. C. M.

San Francisco, Cal., July 27, 1910.

Standard Thermometer Co.,  
Boston, Mass.

Gentlemen:—

I testify with pleasure to the general satisfaction that your motorcycle speedometer has given. I find it the steadiest and most accurate instrument of its kind that we have had and I have sold more of them to satisfied customers than I ever did of any other instrument.

I predict a big sale for your speedometer as its reliability becomes known.

Yours truly,

C. C. HOPKINS.

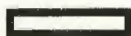


Factory No. 3.

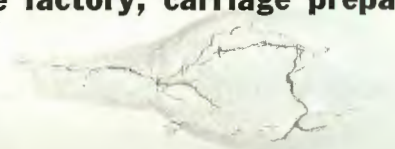
## GUARANTEE



**Q** The **ACCURACY** and **STABILITY** of our instruments if properly installed are guaranteed beyond question. The instruments are put through a thorough comprehensive test before leaving the factory and all parts are interchangeable. Our guarantee is most specific and liberal.



**Q** **WE GUARANTEE** 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.

A faint, circular watermark or stain is visible at the bottom left of the page, featuring a central point with radiating lines, similar to the flourish above.