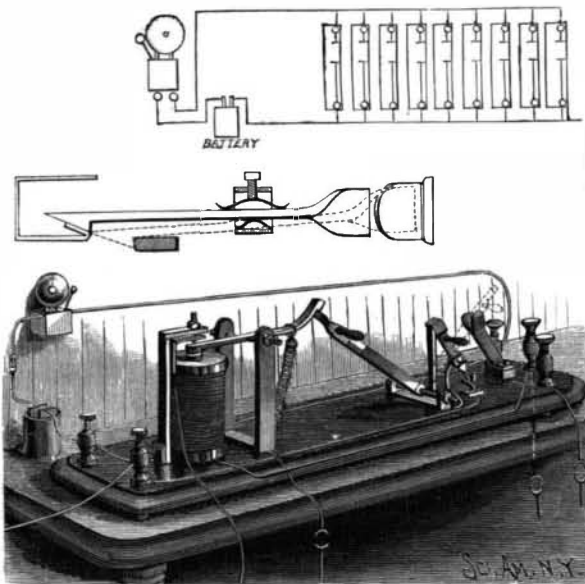


**A LIGHTNING AND HEAVY CURRENT ARRESTER.**

The illustration represents a current arrester, charge grounder, open-circuit alarm, and automatic live wire tester, patented by Miller R. Hutchison, of No. 18 North Commerce Street, Mobile, Ala. It is intended to protect telegraph, telephone, fire alarm, call bell, and all low-potential instruments that are liable to damage from lightning and live wires, giving notice by an alarm bell of the passage of a heavy current, and de-



HUTCHISON'S CURRENT ARRESTER.

termining whether it is due to a stroke of lightning or a continuing and dangerous current from a live wire of high potential. The ordinary line current, entering the instrument at a binding post, passes by wire into jaws on the base of the instrument, thence through a bar constituting a drag switch and into a support, and through an upright and wire to the metal bearing in which is journaled a spring-actuated pivoted shunt bar, the limit of the motion of which is indicated by the dotted lines. From the shunt bar the current passes to a pivoted armature lever normally held out of contact with the magnet by a spiral spring, the bottom end of the magnet wire being also connected with the bearing in which the armature lever is journaled, and the magnet being connected with a ground wire. When a live wire or heavy charge of lightning strikes the line wire, the magnet attracts the armature lever to free the shunt bar from its catch at the other end of the lever, when the shunt bar springs over to the position shown by the dotted lines, and into contact with spring jaws forming a shunt bar support and holder, a grounding wire from which grounds the charge and entirely cuts out the magnet. At the same time the rising of the armature lever effects contact, through a standard, with the terminals of a bell circuit to sound an alarm, the alarm bell ringing continuously until the instrument is reset. This may be effected by grasping a rubber handle of the shunt bar and pulling it over until its end is caught by the catch of the armature lever but in case the alarm had been caused by a live wire, this would burn out the magnet before the armature lever could be again removed from contact, and as a precaution against this provision is made for opening the circuit automatically through the drag switch, the detail of which is shown in one of the small figures. With this switch in circuit there is no current on the shunt bar when reset by the operator, and not until the circuit is reformed by adjusting the drag switch, when, if the heavy current is still on, the shunt bar quickly and sensitively parts from the catch of the armature lever, and the magnet is not burned out. For switchboard use, or where more than one instrument is used, the instruments may be arranged on a table, as shown in one of the small figures, the connections being so made that the alarm will be rung from any one of the instruments.

**AN IMPROVED STEAM CONDENSER.**

The illustration represents a simple and inexpensive condenser designed to condense exhaust steam at a relatively high temperature, thus obviating excessive back pressure on the engine piston. The improvement has been patented by Michael and James V. Spelman and William H. Graves, of Shreveport, La. The shell of the condenser is formed of two parts, united by flanges and bolts, and within its lower part is an inverted cone receiving vessel having an overflow pipe delivering into the bottom of the shell. Above the receiver is an inverted cone perforated distributor, supported by the upper part of the shell immediately below a deflecting cone wherein slides a vertical perforated tube, to more or less fully close the outlet from the condenser. The exhaust pipe delivers into the condenser centrally at the bottom (the drain pipe leading from one side), and the entering steam is directed upward in divided currents until it strikes the deflecting cone at the top, when it is forced downward through the distributor, to be further divided and thrown evenly throughout the whole upper part of the shell, causing it to condense rapidly, and the water of condensation being caught by the receiver and flowing out through the drain pipe.

**THE CHICAGO MOTOCYCLE RACE.**

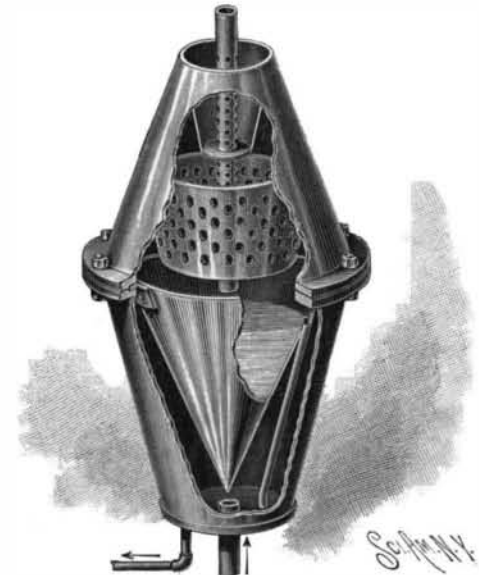
In 1894 a great impetus was given to the automobile carriage by a competition organized in Paris by the Petit Journal. The course was from Paris to Rouen, 75 miles, and the prizes amounted to \$2,000. Fifteen competitors started in the race, the best time being 5 hours and 40 minutes. On June 11, 1895, occurred another race in France, for prizes aggregating \$8,000. The course measured 727 miles, and was from Paris to Bordeaux and return. Sixty-six vehicles competed, and the best time was made by a petroleum carriage, which made the entire journey in 2 days and 53 minutes, or at the rate of 14.9 miles an hour.

With a laudable intent to awaken widespread interest in the motorcycle, two papers offered last July substantial prizes aggregating \$10,000 to be competed for by horseless vehicles. The Chicago Times-Herald offered \$5,000 in four prizes for the winners in the race of November 2, and the Engineer of London offered about \$5,000 for a race to be held in England. Under the existing law in England, which prohibits the use of steam carriages on the roads at a greater speed than four miles per hour, no adequate competitive trial could take place, but a repeal of the law is confidently expected, so that allowing time for necessary legislation the competition can scarcely take place at an earlier date than October, 1896. No vehicle must weigh over two tons, the limit being fixed by the Shaw-Lefevre

over three weeks, only six contestants started on Thanksgiving day morning, November 28. It is probable the terrible storm just preceding the day fixed for the trial and the accumulation of snow and mud deterred many from appearing.

The route selected was as follows:

Midway Plaisance, Washington Park, Fifty-fifth Street Boulevard, Michigan Boulevard, Rush Street, Lake Shore Drive through Lincoln Park, the Sheridan Drive and Kenmore Avenue to Evanston; thence



SPELMANS & GRAVES' STEAM CONDENSER.

south on Clark Street and Ashland Avenue to Roscoe Street and Western Avenue, west on Belmont Avenue, southeast on Milwaukee Avenue to Humboldt Boulevard and through Humboldt, Garfield and Douglas Parks to Western Avenue Boulevard, east on Fifty-fifth Street boulevard and Washington Park to Jackson Park and the Midway.

Three days before the race, Chicago was visited with a veritable blizzard, which almost entirely cut off the city from telegraphic communication, crippled railroads, and brought the cable and trolley cars to a standstill. The streets were choked with snow, which was soon mixed with the accumulations of dirt, until they became well nigh impassable. The snow was 12 inches deep in places. It was in the midst of this city of snow and slush that six motorcycles started for their race at 8:55 A. M. on Thanksgiving morning.

The vehicles competing were: The Duryea motor carriage, of Springfield, Mass.; the Morris & Salom electrobat, of Philadelphia, Pa.; the Benz-Mueller motorcycle, entered by Mr. H. Mueller, of Decatur, Ill.; the Roger motorcycle and the De la Vergne motorcycle, of New York; and the Sturges electric motorcycle, of Chicago.

The course was fifty-four miles long. The De la Vergne machine quit at Sixteenth Street; the Morris & Salom electrobat and the Sturges electric motorcycle made short runs and then dropped out of the race. Both the electric vehicles returned in good condition and made a good showing under the circumstances. The Roger machine broke its running gear when half of the course was covered and lost the race.

The probable winner of the first prize was the Charles E. Duryea gasoline motorcycle, which made the fifty-four mile run in ten hours and twenty-three minutes.

The Benz-Mueller motorcycle came in second, covering the course in eleven hours and fifty-eight minutes. Considering the condition of the

roads, this showing was very satisfactory. An engraving of this machine will be found in our paper of November 16, 1895. The prizes offered were as follows:

First prize—\$2,000 and a gold medal, the same being open to competition to the world.

Second prize—\$1,500, with a stipulation that in the event the first prize is awarded to a vehicle of foreign



THE DURYEY FIRST PRIZE MOTOR WAGON.

bill, which was introduced during the last Parliament. When the Times-Herald first made its offer, it was feared that the time was too short for American inventors to construct motorcycles which would stand a fair trial when compared with the skilled construction of the most experienced French and German makers. This prediction was fulfilled, for out of nearly one hundred machines entered, and after a postponement of