

A NEW GAS REGULATOR.

The unavoidable fluctuation of gas pressure is the main if not the only objection to the use of gas as an illuminating agent. The sudden flaring up of the flame under increased pressure not only impairs the light and indicates a waste of gas, but it permits a quantity of unconsumed carbon to escape and vitiate the atmosphere of the room and endanger the health of the occupants.

The importance of avoiding the escape of unburnt carbon has not been fully recognized in this country. In Europe this subject has received considerable attention, and in many of the cities gas regulators are in general use.

We illustrate one of the most successful of these instruments, which, after the most thorough tests, has been adopted in several different departments of the United States Government, and it has been in successful use in many of the public buildings in Washington for several years.

The regulator, which is shown in perspective in Fig. 1 and in section in Fig. 2, has the usual casing composed of two hemispheres, A B, joined together by screws that pass through the flanges, between which the edges of the diaphragm, C, are tightly clamped. The lower hemisphere has an inlet, D, and an outlet, E. The diaphragm is composed of two thicknesses of pliable leather, having their adjacent faces coated with plumbago or other gas resisting medium. The coating being thus placed out of direct contact with the gas remains unaffected.

A valve stem, F, is suspended from the center of the diaphragm, and carries at its lower end a conical valve, G, which is capable of closing against the valve seat so as to entirely shut the inlet. The stem, F, rises above the diaphragm and passes through a hole in the top of the casing into a supplemental case, J. A lever arm, K, is pivoted in a standard at the top of the supplemental case, and is connected with a vertically sliding rod, L, which carries at its lower end a forked foot that embraces the valve stem, F, below the adjusting nut. The sliding rod, L, moves in a tube, and is pressed downward by a spiral spring. The lever arm, K, is connected by a wire with the knob, shown in Fig. 3, either directly or through a system of bell cranks or pulleys. By turning this knob, the regulator may be adjusted so that any desired pressure may be had in the distributing pipes; this pressure will thereafter be maintained with certainty and uniformity. Any increase in the gas pressure in the regulator raises the diaphragm, and by closing the valve diminishes the supply; a diminution of pressure produces the contrary effect.

This regulator was recently patented by Mr. Joseph Adams, through the Scientific American Patent Agency, who may be addressed for further particulars at Room 40, Corcoran Building, Washington, D. C.

COMBINED TRACTION ENGINE AND STEAM FIRE ENGINE.

A combined traction engine and steam fire engine, constructed by M. A. Schmid, of Zurich, and exhibited at the Paris Exhibition, has as a test of its liability to travel, made the journey from Zurich to Paris, a distance of about 450 miles, in eight days. The engine itself, in service, weighs six tons, and brought with it a wagon weighing about five tons, containing coals sufficient for forty and water for fifteen miles. As there were in the road over which it passed gradients of one in seven, there can be no doubt of its ability to surmount any ordinary difficulties. As will be seen from the illustration, for which we are indebted to the *Engineer*, the engine is supported on three wheels, the leading wheel being worked by a crosshead and

lever bars from the foot plate. The distribution of weight is very happily chosen, and the consequent tendency to upset on uneven ground, with only three wheels, is entirely obviated by the way in which almost the entire load is thrown on the driving wheels. The cylinders have a diameter of seven inches and a stroke of ten inches, and the motion is communicated to the driving wheels by toothed gear and an endless chain. The latter can be instantly disconnected, and the engine used either as a steam fire engine capable of throwing 300 to 400 gallons per minute under a pressure of 100 lbs. to the square inch, or as a portable en-

would undoubtedly necessitate a considerable dismantling of many members which, in an ordinary engine of this class, would neither interfere nor be interfered with. We cannot speak too highly of the workmanship, and from its performances as witnessed in the limited space within which its gyrations are confined, the favorable impression derived from its finish, compactness, and general appearance has been fully confirmed.

New Mechanical Inventions.

An improvement in Vibrating Churns has been patented by Mr. Samuel Mellon, of Cameron, West Va. The object of this invention is to furnish a mechanism by which a churn may be easily operated, and to construct the operative parts in such a manner that they may be readily attached to and taken off the churn.

An improvement in Vehicle Springs has been patented by Mr. David G. Wyeth, of New Way, Ohio. This is an improvement upon the spring covered by letters patent No. 187,694, issued to the same inventor. The improved gearing has a less number of parts and also a greater compactness as a whole, so that it is lighter and cheaper than the other.

A Vehicle Wheel Hub has been patented by Mr. Daniel May, of Lumberton, N. C., which consists in a hub having mortises in the axle box for the spokes, which mortises are open at alternate sides, and collars having projections on their inner faces to enter the mortises in the axle box, so that the mortises are closed after the spokes are inserted. The collar on one side closes the openings on that side, and the openings at the opposite side are closed by the other collar.

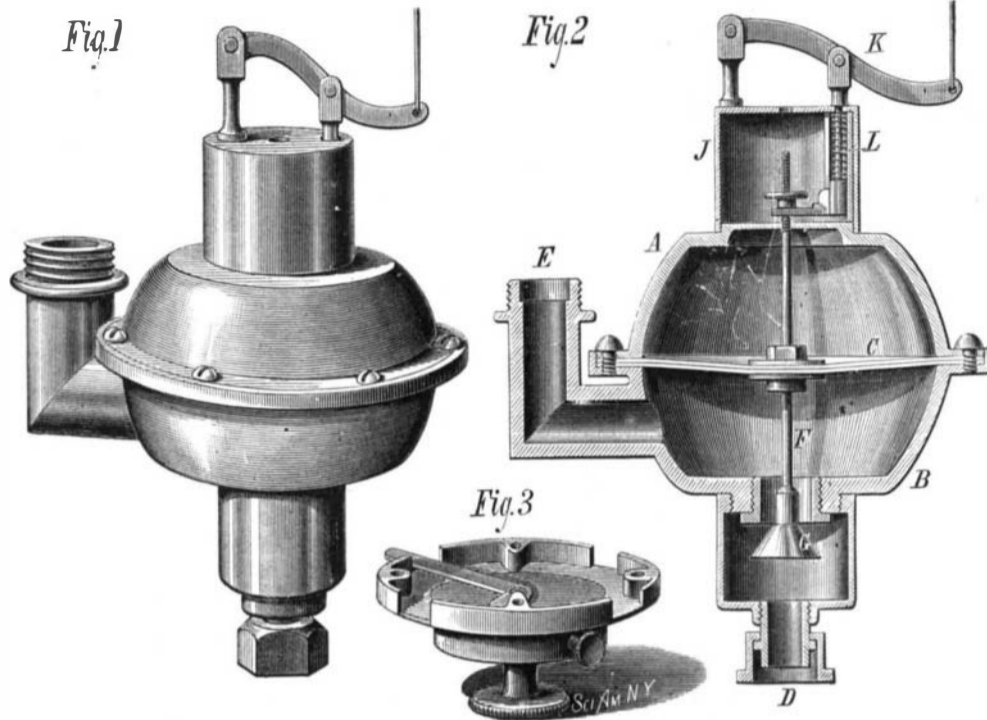
An improvement in Trimmers for Wax-thread Sewing Machines has been patented by Messrs. Joseph I. Pellerin and Hector Pellerin, of Montreal, Quebec, Canada. The object of this invention is to provide means for applying the principle of cutting the leather simultaneously with the seaming thereof to the class of shoemakers' sewing machines which use a waxed thread.

An improved Waxing Device for Sewing Machines has been patented by Mr. Wm. S. Hadaway, of Chiltonville, Mass. This invention is intended to furnish for power-operated sewing machines an improved thread-waxing device that can be easily adjusted for differently sized threads, and that may be easily regulated for the quantity of wax to be used, so as to save a great portion of the wax hitherto wasted.

An improved Machine for Straightening Car Axles has recently been patented by Mr. Joseph A. Hodel, of Cumberland, Md. By a system of adjustable jacks and yoke with counter screw, the straightening strain is confined to the part that is already bent without affecting the other parts of the axle.

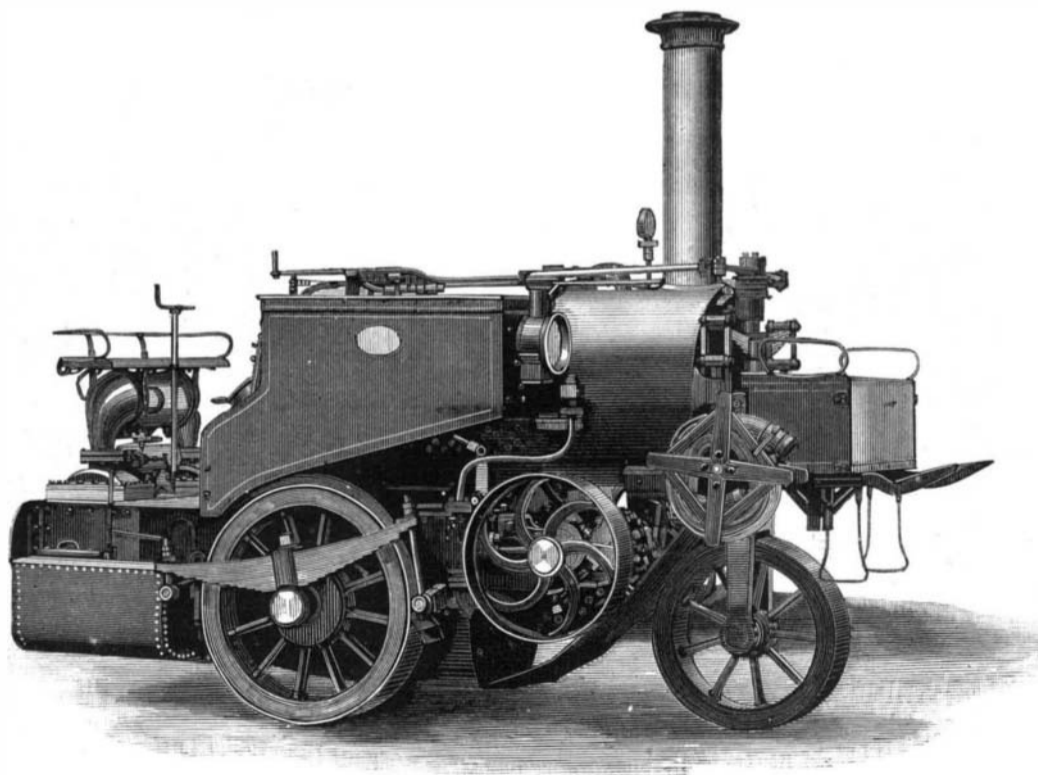
Mr. Eben Brown, of Milford, Mass., has patented an improvement in Machines for Turning Needle Blanks. This invention is to automatically regulate the action of the cutting tool upon the blank in turning machines, so that the blank will be cut to the standard gauge, and the tendency of the machine to enlarge the needle or other article produced from the blank is corrected by the act of forming such blank.

An improved Stock Car has been patented by Mr. Henry S. Moody, of Omaha, Neb. The object of this improvement is to protect cattle from bodily injuries, to allay fever, and to counteract the effects of heat, thirst, and exhaustion, from which the animals so severely suffer as the result of the present mode of transit in railway cars. This improvement secures to the consignor the full normal weight, and the consumer the benefit of meat in a prime and healthy state.

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gine for agricultural purposes. The diameter of the driving wheels is forty inches, and of the steering wheel thirty inches; the grate surface is five square feet, and the heating surface one hundred square feet; the usual pressure of steam is 150 lbs. to the square inch.

According to the statement of those who accompanied the engine from Zurich, the journey was effected without any mishap or breakdown of any kind. The highest speed attained was fifteen miles per hour. The tires of the wheels give evidence of the nature of the road over which it passed; otherwise there was nothing about it to denote the test it

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had withstood. With regard to the general disposition of the moving parts, certainly no space has been lost, but the difficulty of making repairs has been proportionately increased; and although the state it is now in shows no sign of an early probability of any repair being required—excepting, of course, the renewal of packing, etc., which it has already undergone without any extraordinary removal of parts—the replacement of any damaged or worn member