

IMPROVED CENTERING CHUCK.

The annexed engraving represents an improved chuck for centering work before adjusting it on the lathe. The construction is strong and exceedingly simple, and the device generally is well calculated to save time and trouble. The lower portion or standard is rigidly attached by screws to a suitable bed. On its upper face are spirally disposed projections, A, in which engage recesses, B, on the lower surface of the jaws, C. Said jaws have side recesses which receive projections, D, on inner side of the mortises in the upper revolving portion, E, in which mortises said jaws work radially. Through said upper portion, E, pass the screws, F, their inner ends entering a groove on the standard, thus retaining the part, E, in place while allowing it to revolve.

It will be evident that when said portion, E, is rotated by the handles shown, the jaws will, by the spiral projections on the standard, be caused to move uniformly and simultaneously toward or from the center. In using the device the work is placed between the jaws, as represented in our illustration, and the latter are tightened. The object is thus adjusted so that its center rests directly upon the metal cone, G. It only remains to strike the work from above with the hammer, and the point of the cone makes the necessary indentation.

For further information address Mr. A. F. Cushman, Hartford, Conn.

A New and Powerful Explosive.

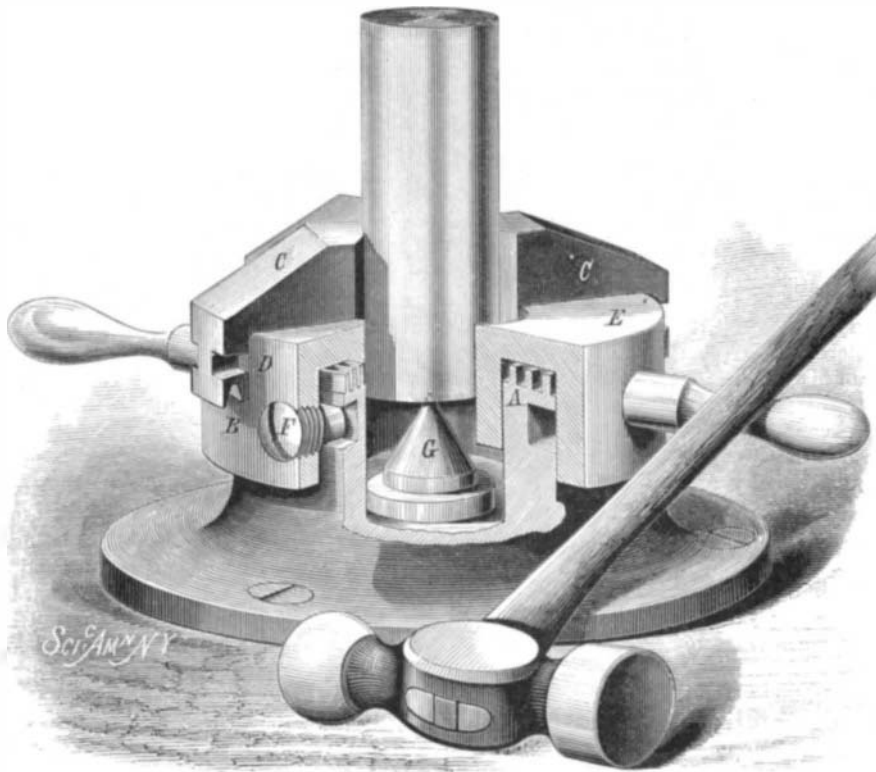
We learn that M. Nobel, the inventor of dynamite, has recently discovered a new explosive substance still more powerful than that. He has given it the name of "explosive gelatine," on account of its aspect, which closely resembles gelatine. The substance is composed of 94 to 95 per cent of nitro-glycerine, and 6 or 5 per cent of collodion, mixed together. It is viscous, but can be easily cut with a knife or with scissors, and placed in cartridges or shells. Dynamite, it is known, has the disadvantage of being alterable by water—when it is moist the nitro-glycerine separates from the absorbent. The new substance, on the contrary, does not give the least symptom of exudation; it is impermeable to water, which does not at all affect its explosive properties. It is inflamed in the same way as dynamite, and its power is at least 50 per cent greater. Italy and Russia have, it is said, adopted this substance for charging bombs, torpedoes, etc.

COMBINED VENTILATOR AND CHIMNEY.

The accompanying illustrations represent a combined ventilator and chimney, which, we are informed, has been found economical, safe, suitable for light structures, and capable of being easily put up by any one. Fig. 1 is a perspective and Fig. 2 a sectional view; in the latter A represents the chimney flue, which is made preferably of tin lined with No. 24 sheet iron, the same being riveted through wherever the joints may lap. An outer casing, B, is suitably attached by a flange, C, to the ceiling, while the body and whole support of the chimney is held by supporting straps, D, firmly riveted to the outer casing, B, and fastened to the timbers or sheeting of the roof.

The water-proof connection of the casing, B, with the roof at the point of its passage through the aperture of the same, is made of two sheet metal plates, E, so constructed that they shall clasp the outer casing, B, from opposite sides. The upper plate laps over the lower one, and each is provided with its half of a collar, F, so cut and fitted to the same by soldering as to make a perfect water-tight connection independent of any soldering to the outer casing, B. The upper edge of the halves of the collar is secured by a close-fitting ring, G, or by any other suitable means. A chimney extension or tube, H, is fitted into or otherwise firmly attached to the upper end of chimney, A, and protected against the rain at its upper end by a cap or shed. Lower down on the same a second cap, I, is formed by the flaring out of an outer casing, so as to extend around and protect from rain the upper end of casing, B, and also the collars of the water-proof plates, E. The heat of the smoke and gases of combustion, passing up through the chimney flue, produces the heating of the air in the ventilating space around the same, so as to cause, by the rising of the air to the outside, a draught from the room, and thereby a ventilation of the same. The sheet iron chimney, A, having a tin casing next to the ventilating space, the corroding action of the air upon the outer surface of the same is prevented, and, being riveted together wherever the joints of either may lap, one strengthens the other, and a greater dura-

bility is attained thereby. The outer air casing surrounds the chimney complete, and not being dependent upon solder in any of its connections, the liability of accident by burning out of the chimney from the accumulation of soot is claimed to be rendered impossible. There being no contact of the inner flue with the wooden parts of the building, the danger of fire from the chimney is avoided.

**IMPROVED CENTERING CHUCK.**

Patented through the Scientific American Patent Agency July 14, 1874. Further particulars may be obtained by addressing Hinckley & Son, Dallas, Texas.

Water Supply of Cities.

The Prince of Wales has addressed a letter to the Society of Arts, suggesting an open discussion on this question, with a view to the consideration of some comprehensive scheme of a national character, by which the vast natural water resources of the kingdom might be turned to account for the benefit, not merely of a few large centers of population, but for the advantage of the general body of the nation.

Early History of the Steam Engine.

John W. Hackworth, who witnessed the trial of the "Royal George" locomotive in 1828, writes as follows to the London *Miller*:

M. Cugnot, a French mechanic, first produced a self-moving steam carriage in 1769, and the following year (under Government auspices) constructed a second, which conveyed artillery and passengers. William Murdock, of Redruth, Cornwall, made a working model machine of this class in 1785. In 1786 Oliver Evans, a native of Newport, Delaware, was granted by the Legislature of Maryland the exclusive right in that State of using steam carriages on common roads, and shortly after constructed one. Richard Trevithick—who had repeatedly examined Murdock's model—made a machine of this kind at Camborne, Cornwall, in 1802. Timothy Hackworth's "Royal George" locomotive, constructed for the Stockton and Darlington Railway Company, was started in September, 1827. It was the first that exceeded the efficiency of horse power, and frequently traveled more than twenty miles an hour. The following experiment with the "Royal George" was witnessed by Robert Stephenson, Joseph Lock, Timothy Hackworth, and myself, early in 1828, and was, at the special request of Robert Stephenson, inserted in Rastrick and Walker's printed report, which they laid before the directors of the Liverpool and Manchester Railway Company on March 7, 1829. Report, p. 17: "Hackworth's engine took forty-eight and three quarter tons at eleven and two tenth miles per hour on a level, and the steam was blowing off when the experiment ended." Remarks by Rastrick and Walker in said report: "We state the preceding as it has been given to us. Hackworth's engine is undoubtedly the most powerful that has yet been made, as the amount of tons conveyed by it compared with the other engines proves." Comparing the date of the "Royal George"

(namely, September, 1827) with that of Sir Goldsworthy Gurney's common road engine (namely, July, 1829), it will be seen that nearly two years before the latter appeared the railway locomotive was an accomplished fact. Hence, had Sir Goldsworthy Gurney never lived, not one single detail of the railway locomotive would have been wanting, nor less perfect, nor its advent delayed five minutes.

New Mechanical Inventions.

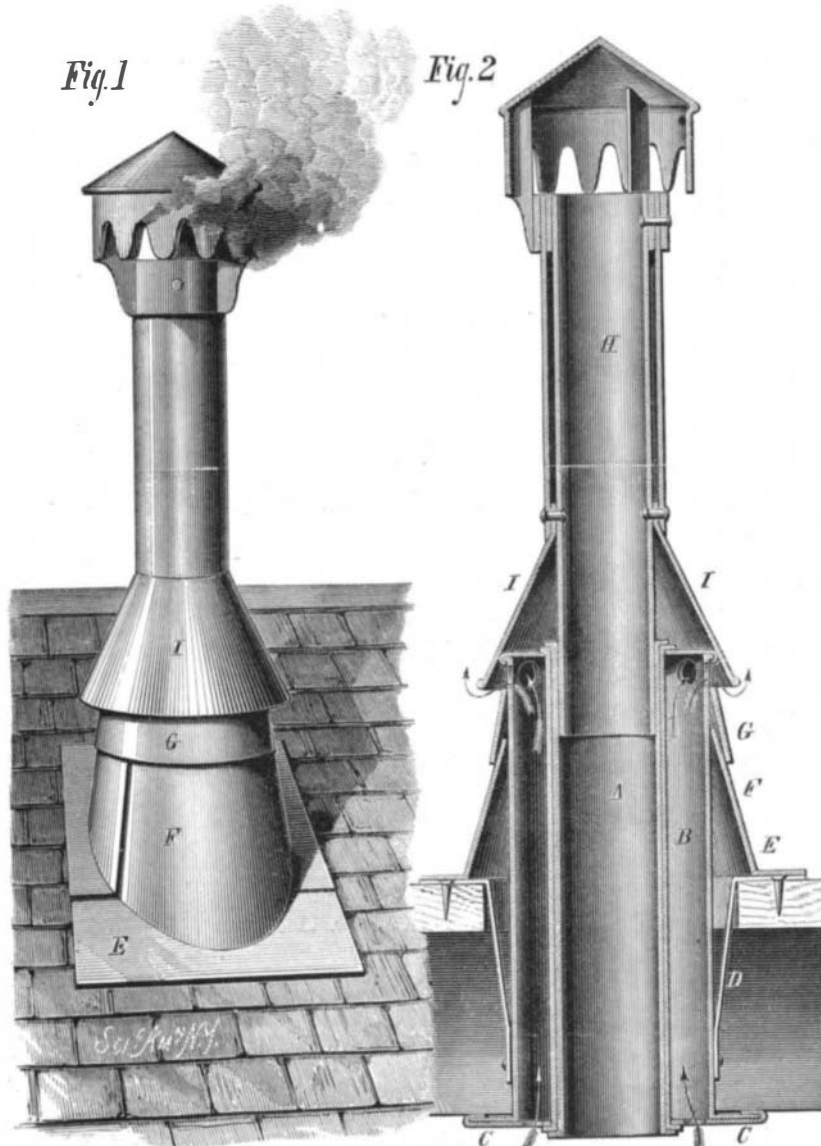
An improved Rotary Valve for Steam Engines has been invented by Mr. D. W. Jones, of Pocahontas, Ark. It has an arrangement of steam passages in the valve, and ports and passages in the valve casing, by means of which the pressure on the valve is equalized or counterbalanced, so as to relieve the latter from friction.

A machine for Trussing Barrels has been patented by Mr. H. W. King, of Alden, N. Y. The object is to furnish means of rapidly applying truss hoops to barrels, and also for confining barrels during the process of heating. The machine has an annular head carrying a truss hoop, between which and a form on the head the upper ends of the staves are placed. A movable frame carries a hollow cone for driving down the truss hoops and giving form to the upper end of the barrel. There is a separable bed having a conical cavity, at the sides of which grooves are formed for receiving the hoops to be placed on the lower end of the barrel. The lower ends of the staves are contracted by a suitable device after the upper ends are secured. There is also a bed carrying a hollow cone for confining the barrel during the process of heating.

Improvements in Giggling Machines for Napping Cloth have been patented by Messrs. Christian Woelfel and James Massey, of Chester, Pa. The guide rolls of reciprocating napping cards are combined with adjustable bracket plates guided in recesses of the main frame and set by suitable screw gear, while the napping cards are reciprocated at right angles, or any other lateral angle of inclination, to the cloth by means of eccentrics and vertical shafts. These are improvements on patent No. 172,991.

Mr. A. S. Hickley, of London, England, has secured a United States patent for a new Electric Fire Alarm and Signaling Apparatus, in which the warning is given by a compound thermometric spring set to the required degree, making connection and sending an electric current to an ordinary clock-work alarm bell, when the temperature of the surroundings is raised by fire. The principle is not a new one, but is applied in a novel manner.

An improved Gang Wood Saw, making

**COMBINED VENTILATOR AND CHIMNEY.**