

Sir Joseph Whitworth.

At the late meeting of the British Iron and Steel Institute in London, the Bessemer Medal for 1880 was conferred upon Sir Joseph Whitworth, whose successes as a mechanician have earned for him a world-wide reputation.

Sir Joseph was born December 21, 1803, at Stockport, Cheshire, England. At the age of fourteen he entered his uncle's cotton mill in Derbyshire; and in 1821 he proceeded to Manchester, where he spent four years in the machine shops of Crighton & Co. and others. He afterwards spent several years in noted London workshops. In 1833 he returned to Manchester, and started business on his own account as a manufacturer of engineers' tools. It was here that he first became generally known for superior workmanship and for his inventions for the improvement of machinery, the production of true surfaces, etc. His theories on the latter score were announced in a paper read before the British Association at Glasgow in 1840, and during the next ten years he was able to carry them out practically in various mechanical inventions and improvements, among them the duplex lathe, the reversing tool of the planing machine, interchangeable nuts and screws, and standard gauges. His tools achieved especial distinction at the great Exhibition of 1851, where he received the Council Medal for a measuring machine of wonderful delicacy and exactness. He was one of the Royal Commissioners to the World's Fair in this city in 1853, and on his return he undertook for the British Government the construction of machinery for the improved production of firearms. Since that time he has been one of the leading exponents of the science of gunnery.

He was elected Fellow of the Royal Society in 1857, and has won several grand prizes at international exhibitions for improvement in cannon and in the working of steel. His strongest claim for permanent favor and honor rests, however, upon the "Whitworth Scholarships," which he founded in 1869 for the encouragement of mechanical and engineering science. These scholarships are thirty in number, of \$500 a year each, and tenable for three years by successful competitors in certain specified mechanical subjects.

Another Mathematical Prodigy.

An eleven year old boy, Jacques Inandi by name, is astonishing the French with his marvelous faculty of reckoning. He can neither read nor write. His calculating power appears to rival that of Jedediah Buxton, Henri Mondeux, Colburn, and others of the class.

AUTOMATIC FEED WATER APPARATUS FOR STEAM BOILERS.

The annexed engraving shows an improved apparatus for regulating the supply of water fed to steam boilers. It operates by gravity of water contained in a movable tank connected with the boiler by two pipes, one above, the other below the water line. A rod connects the movable tank with the valve of a feed pump, or with the throttle valve of a steam pump, if a steam pump be used.

In the engraving, A is the tank, connected with the boiler by pipes, B C, the pipe, B, entering the boiler at the top or at any other convenient point above the water line, while the pipe, C, enters anywhere below the water line. The weight of the tank, A, and the water contained by it are supported by a weighted lever, D, which is adjusted so that, when the boiler is properly filled with water, the weight on the lever will be overbalanced, and the tank, A, will rest in its lowest position; but when the water level in the boiler is abnormally low the level of the water in the tank, A, is correspondingly lowered, and the tank is thereby made lighter, when the weight on the lever, D, preponderates and raises the tank, A. The movement of the tank, A, both up and down is limited by two screws in an arm projecting from the framework supporting the lever, D. The motion of the tank, A, is made available in regulating the amount of water supplied to the boiler by connecting the tank by means of a rod with a valve in the boiler feed pipe, or with the throttle valve of a steam pump, or with the valves of an injector, all depending, of course, on the particular method of feeding the boiler. When the tank rises it opens the valve and allows the water to flow into the boiler; when it descends the valve is wholly or partly closed, and the feeding is checked. By means of this device, the inventor says, the water level in a boiler can be perfectly maintained without special attention, and it makes no difference whether the water foams or is perfectly quiet, the weight of the water contained by the tank, A, is depended on, and not its seeming bulk. It is claimed that this device is far more reliable than gauge cocks or water gauges.

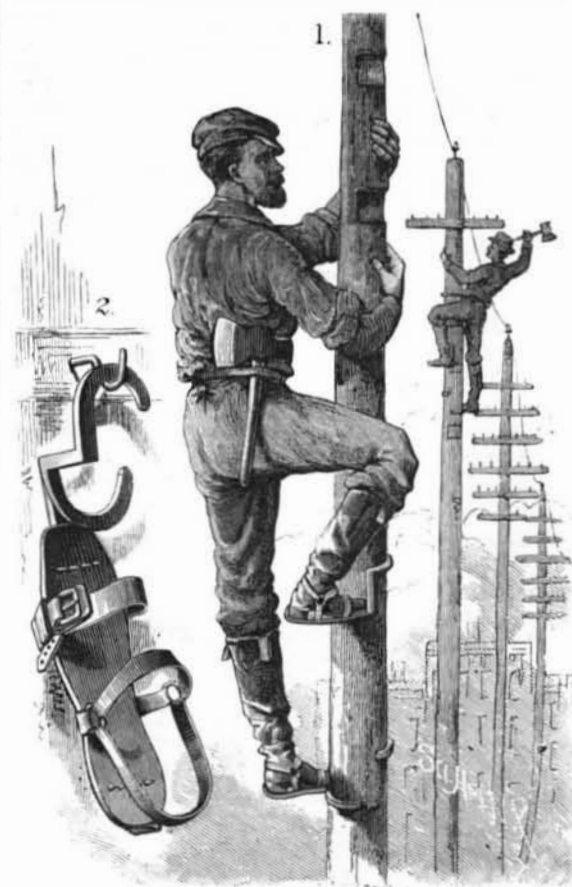
This device is supplied with valves by means of which it

may at any time be blown off and cleaned. We are informed that one of these boiler feeders has been in use on a boiler in Red Wing, Minn., for the past ten months, and has been subjected to every possible test, and has proved reliable under all circumstances.

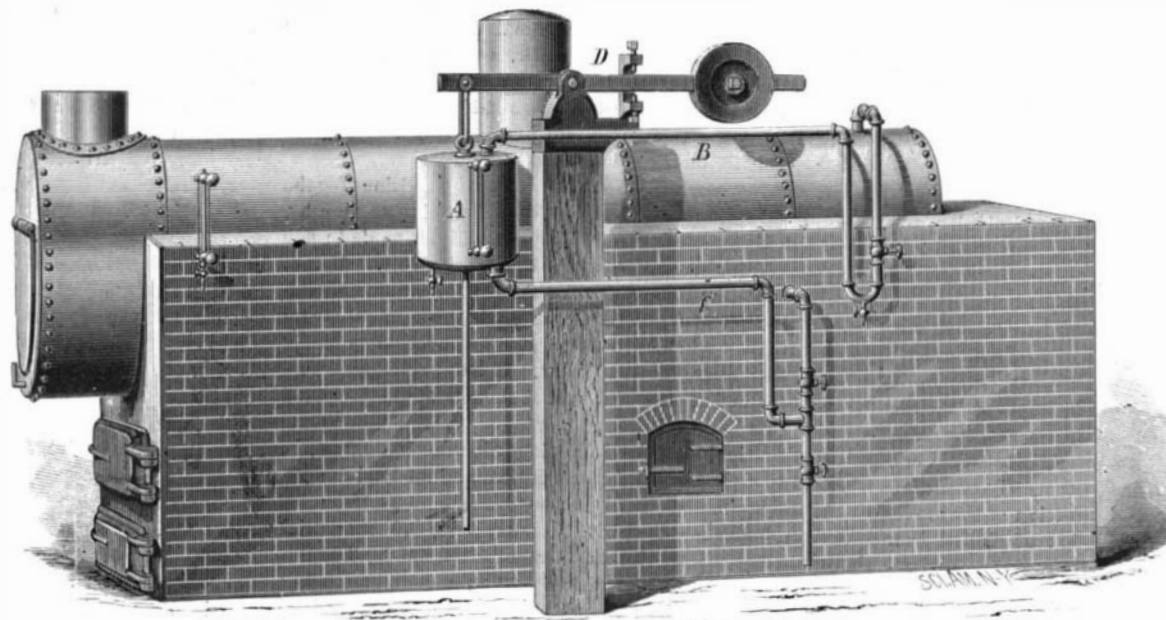
Further information may be obtained by addressing Mr. Henry Bergstrom, Red Wing, Minn.

CLIMBING APPARATUS.

A sailor is in his element when climbing to the top of a high mast, and experiences no more trouble in reaching the top of the mast than we do in going to the attic of our dwelling. Such gymnastic exercises are, however, not in the province of the engineer, and whenever he has to execute any work upon any object situated at a certain height, his

**CLIMBING APPARATUS.**

only means of ascending to it are by ladders or stages. The latter are, of course, only used where the expenses of such a structure may be incurred, and not at all suitable for reaching the top of ordinary poles or masts. In such a case ladders are generally employed, as being the only means available, but the lateral pressure upon any high post of a long and necessarily heavy ladder is very great, and its employment in such cases not devoid of danger. As nowadays telegraph poles are erected all over the country, and since the introduction of the telephone, often in situations difficult of access with a ladder, it becomes a matter of considerable importance to engineers to be able to reach the top of these

**BERGSTROM'S BOILER FEEDING APPARATUS.**

posts with ease in order to be able to execute there the work which falls to their share, and upon the solidity and reliability of which very often many important matters depend. To facilitate the ascension of these posts a Swedish engineer has invented the climbing device shown in our illustration.

The principal part of the apparatus consists of a shoe attached to the foot—something in the manner of skates. It consists of an iron sole plate, which is attached by means of bolts and clips to a steel bar; to the sole are fixed the straps

and rings, while the end of the steel bar is turned up at the end to form a cap. To the outer end of this bar two curved arms are hinged in such a manner that their points remain always a certain distance apart.

When the apparatus is to be used the soles are buckled to the feet of the operator, and there must, of course, be a pair of these apparatus with the curved arms set to opposite sides; the man then lifts one foot up after another by holding the foot so that the bar, shown while fixed in a vertical position, is thrown into a horizontal one; this enables the two curved arms to open and to encircle the post, when, by pressing the foot down, they will support the body. Thus one step after another may be taken until the arrival at the required height.

In order to give the operator steadiness, and to free the hands for the necessary work, the operator has a belt attached to his waist which also carries a ring which is capable of sliding along the post. By a simple adjustment the curved arms can be adjusted to the average diameter of the post to be ascended.—*Design and Work.*

NEW INVENTIONS.

Mr. Theodore Suppes, of Buffalo, Ill., has patented an improved washing machine, which is simple in construction, easily operated, and effective in operation, washing the clothes evenly, quickly, and thoroughly.

Messrs. Joel H. Prouty and Solon S. Sprague, of Worcester, Mass., have patented an improved burr-roll for loom temples, which consists of a hollow roll whose body and periphery are one, being formed of sheet metal, which is provided with triangular teeth formed by cutting V-shaped slits in the metal and striking up the pieces thus partly severed from the sheet, while the ends of the roll are provided with openings for insertion of fibrous packing material and of the lubricant for the bearings of the cylinder.

Mr. Rolla R. Jones, of Watertown, N. Y., has invented an improvement in pliers. The object of this invention is to furnish pliers so constructed that they may receive different tools, and that the heads can be removed and replaced as required.

Mr. George W. Terry, of Prescott, Ark., has patented a self-calculating register for postage stamps designed for use in fourth-class post offices, where a daily transcript of the number of stamps canceled has to be kept and forwarded to the department as a part of the quarterly returns, the use of which registers will save a great deal of time and labor in keeping the account.

Mr. Robert Cunningham, of New York city, has patented an improved process of manufacturing articles in imitation of papier mache, consisting in coating the surface of the article with transparent varnish, in then depositing thereon the ornament and allowing it to become fixed, and in then applying over the ornament and its support a covering of transparent varnish and allowing it to become dry.

A device for holding scrubbing, whitewash, and other brushes while in use, so as to permit the convenient and free manipulation of the brush, has been patented by Mr. Eugene B. Randolph, of East Millstone, N. J.

Dust Fires.

A gentleman at Appleton, Wis., communicates to the *American Miller* his experience, which shows, as we all know, that other kinds of dust besides flour are explosive under certain conditions. He says: The loft of my spoke mill, in this city, was wholly used as a finishing room, where the spoke was finished, and polished by contact with rapidly revolving sanded belts. In it was a square or box stove, used for warming purposes. The light, fine dust would accumulate in every crack and crevice of the room, requiring cleaning off every day. One day some of this dust was seen to fall from a rafter upon some live coals that had accidentally got out upon the hearth of the stove. Instantly there was a flash that filled the whole loft, and it was on fire in a hundred different places.

It was with the most active exertions that the fire was subdued, and not without a considerable damage to the building and stock. I believe the air was strongly impregnated with gas evolved by friction; and that the explosion and fire occurring in flour mills are precisely of the same nature and due to the same causes.

STRUCK BY LIGHTNING WHILE UNDER WATER.—At Halifax, N. S., May 29, while divers were at work at Cole Harbor dike a storm came upon them, and the lightning striking an air pump passed down to a diver under the water. When brought up he was insensible, but his injuries are not serious.