

A BOILER FEEDER, REGULATOR, AND ALARM.

This improvement, patented by Mr. P. Brown, is designed to afford absolute safety against danger from low and high water in boilers. It has no floats to clog or fill and no springs to weaken or break, and is without delicate valves or pistons, while, in case of the water supply being cut off from any cause, an alarm is given before the water level falls to the danger point. A vertical cylinder, A, is connected above and below with the steam and water spaces of the boiler, and this cylinder is connected at different elevations by the four flexibly jointed pipes, G, H, with the two spherical vessels, B, C, suspended from the beam, D, fulcrumed near the end of another beam, E, working on a fixed fulcrum. The larger spherical vessel, B, will be about half full of water when the water in the boiler is at a medium height, the smaller spherical vessel, C, being then full of water. By the fall of the water in the boiler the vessel, B, is emptied, the water being displaced by the steam, and the beam, D, is then drawn down by the vessel, C, when, by means of crank and lever connections, the pump or injector is set at work to renew the supply of water in the boiler. When the water reaches the highest point desired, it fills the larger vessel, B, and the beam, D, is again moved to cut off the supply. When the water reaches so low a level that both cylinders are emptied, the connections being such that this will take place before the water drops to the danger level, then a weight, F, on the other end of the beam, E, tips this beam, and, by a wire and chain connection, a whistle or electric alarm is sounded. This apparatus may be arranged in any part of the boiler room where it is most out of the way, but the illustration represents a practical application of the improvement, as adapted to the steam plant of a large manufacturing concern. The equilibrium of condition maintained by the two vessels suspended from the compound lever, and connected to the water column by the flexibly jointed pipes, is such as to permanently secure a very nearly uniform water level, of not more than three-quarters of an inch variation, the alarm being liable to be called into use only in case of some accident or unforeseen stoppage of the water supply.

Messrs. Brown & Ryan, of No. 120 Liberty Street, New York, or No. 49 North Seventh Street, Philadelphia, will be pleased to furnish any further information desired relative to this invention.

Bursting of a Large Fly Wheel.

On the afternoon of September 25 the fly wheel of a 550 horse power engine in the power house of the Cincinnati Street Railroad Company, located at the corner of Reading Road and McMillan Street, Cincinnati, O., broke, and the flying pieces tore their way through the roof and walls, almost cutting the building in twain.

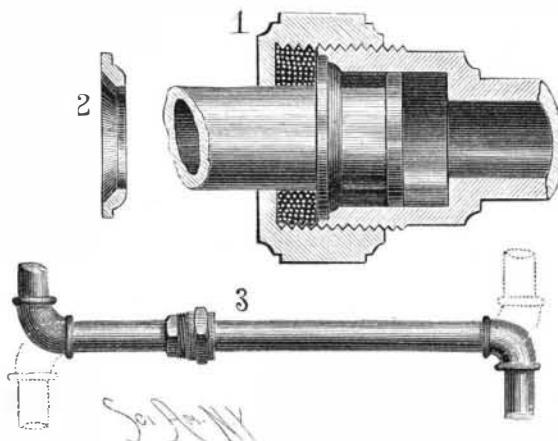
Parts of the wheel, varying in size from five feet in length and four feet wide, weighing 800 pounds, to the merest fragment, were found 1,000 feet from the building. One massive section, weighing 1,200 or 1,500 pounds, was hurled through the roof and fell 500 feet to the northward.

The fly wheel was twenty-two feet in diameter, with a fifty-inch face, and weighed 50,000 pounds. The rim was two inches thick. It was attached to the center engine and revolved on a twelve-inch shaft. In breaking it snapped the spokes near the bearing, and a part of the flying rim struck the receiving pulleys on the main shaft and shattered it, while other parts broke the main pedestal, weighing 4,000 pounds, and the rocker arm which drives the valves leading to the cylinder. The main bearing was also torn out of the stone foundation. The damage to the shafting, belting, and pulleys will probably reach \$4,000. Fortunately there was no loss of life.

IN using the heavier grades of kerosene or refined petroleum oils in lamps, the wick often becomes charred at the top, which obstructs the capillary action of the wick. When the wick is raised, the charred top obstructs the slot in the flame guard and diminishes the flame. Wicks should be often renewed. The old wicks become hard and partially obstructed in the tube.

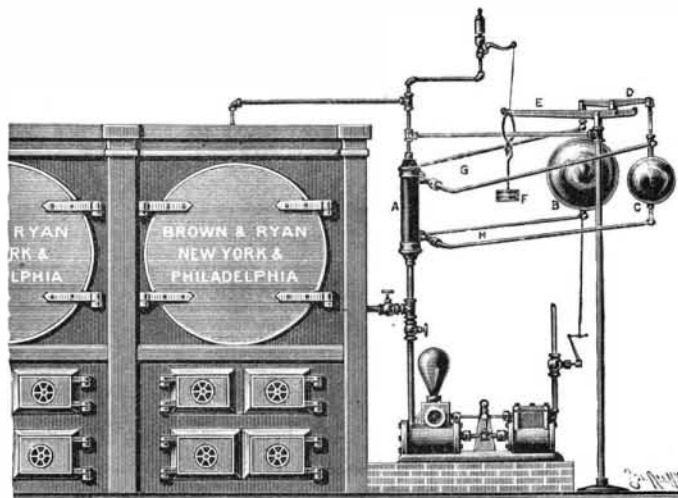
AN IMPROVED PIPE JOINT.

The improvement which forms the subject of the accompanying illustration is applicable to steam, water, oil and other pipes, affording great convenience in adjusting the pipes and preventing breakage or leak-



BROWN'S SWING AND EXTENSION PIPE JOINT.

ing from their expansion and contraction with changes of temperature. It has been patented by Mr. P. Brown, of Philadelphia. Fig. 1 shows the joint-piece or coupling, partly in section, uniting two ends of pipe, Fig. 2 showing a washer used in the joint. One pipe, as will be seen, has on its inner connecting end an exter-



BROWN'S AUTOMATIC BOILER FEEDER, REGULATOR, AND ALARM.

nal flange, fitting within and free to move in or out in a circular inclosed box part or chamber at the connecting end of the adjacent pipe, and also to rotate axially therein. The chambered portion of the adjacent pipe is externally screw-threaded, and has a beveled or concave seat in its face end, in which fits a washer loosely placed upon the other pipe back of the flange, and back of this washer is placed a packing, preferably of asbestos. The packing and the washer are both inclosed by an internally threaded nut which engages with the screw thread on the chambered end, the nut having an inner projecting back flange that closely hugs the body of the pipe back of the packing.

By screwing up the nut to bring the washer in front of the packing up against its seat a tight joint is secured for the meeting end portions of the pipes, both peripherally and endwise. As shown in Fig. 3, the connected pipes are arranged for automatic longitudinal adjustment, or contraction and expansion, by means of this joint, while capable of being axially turned as required to change the position of the elbows at their opposite ends, the bore of the pipe being of the same diameter throughout. It is also apparent that this improvement may be advantageously employed in the connections of pipes for car heating, and in the steam or air couplings between the cars, etc.

Further information relative to this invention may be obtained of Messrs. Brown & Ryan, No. 120 Liberty Street, New York, or No. 49 North Seventh Street, Philadelphia, Pa.

THE GERMAN ARMY SWIMMING EXERCISES.

While the swimming service is obligatory on the pioneers, and lately also on the cavalry, it is optional with the members of the other departments of the army, and the fact that the annual subscription list is always more than full is a pleasant indication of the love of sports among our "Blue Boys." Many an enthusiastic admirer of Neptune must, to his great sorrow, be turned away on account of the great number of applicants.

The instruction is given, under the direction of lieutenants, by under officers. It begins with the regular practice of the swimming strokes, the pupil being supported meanwhile by the so-called "fishing rod."

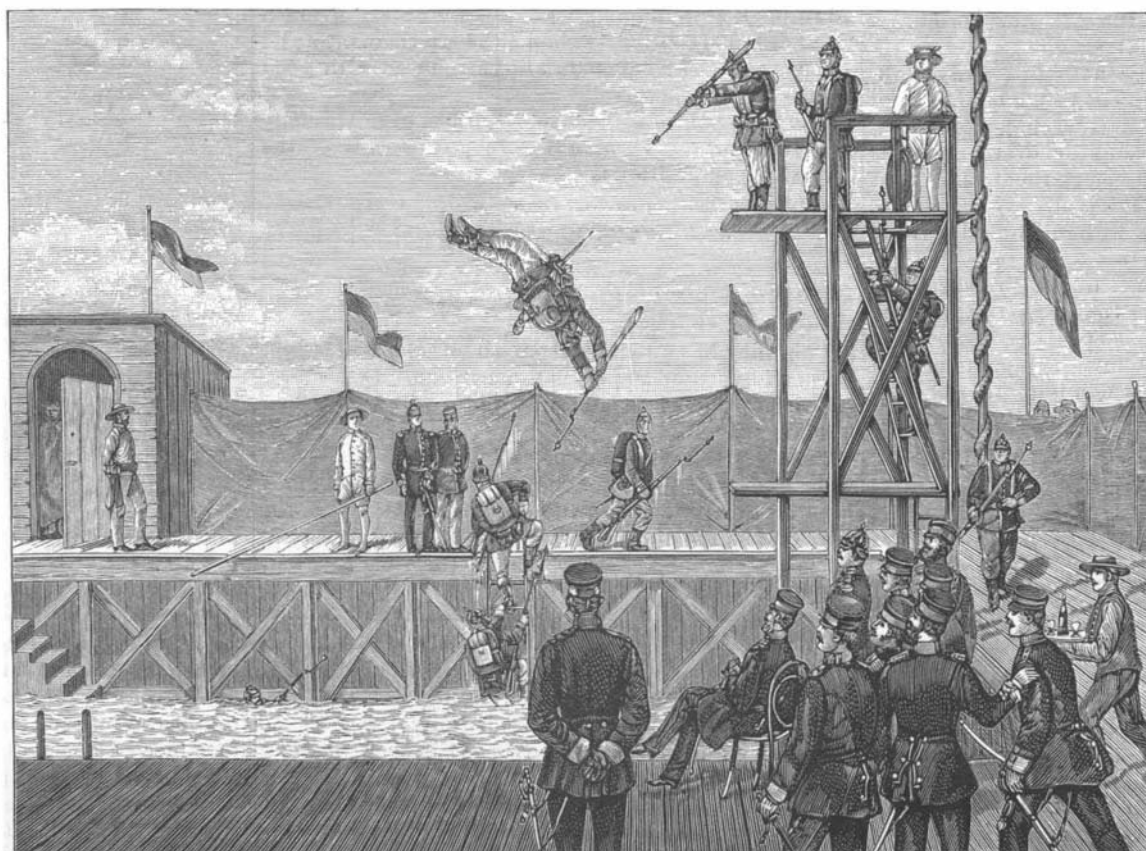
When he has learned the movements well enough to be able to support himself above the water, he begins to swim on a loose line. At this stage it is often found that those for whom the highest hopes had been entertained lack one quality that is indispensable for a good swimmer; we mean that Olympic calm without which the most carefully acquired knowledge of the strokes is useless. When the pupil is able to keep himself on the surface safely and quietly, he must go into the water without the helping line, but a rod is placed a certain distance above his head for use in case of need. After this he must submit to the test of swimming alone for fifteen minutes, then for half an hour, accompanied by a boat, and then comes the "Todtenfahrt" (death trip), which lasts an hour.

The swimming exhibitions held at the end of the summer before the commanders of the battalions or regiments are pleasant festivals and those held in Berlin or Potsdam are often attended by any princes of the reigning house who happen to be in the neighborhood. Classes of men clad only in their swimming tights exhibit their proficiency in swimming, jumping, and diving, and this water exercise in regularly formed lines, squads and sections is a pleasant sight. Lastly comes the most important feature of the programme, the exhibition of the finest swimmers in full marching uniform and with bayoneted guns in their hands. They jump from a high tower into the cool water, on the surface of which these fully armed sons of Mars amuse themselves until the command of the officer in charge calls them from the damp element.

The swimming service of the German army is an excellent institution, for besides giving the men healthy exercise, it tests the courage and self-control of the men in time of peace.—*Illustrirte Zeitung.*

Iron Contracts for the Fair.

It is announced that the contract for the iron and steel work of Machinery Hall, for the Chicago Exposition, has been awarded to the Cofrode & Saylor Manufacturing Company, of Pottstown, Pa. This structure, including the main building and its annexes, will be the most extensive of the Exposition. It will be 850 feet long and 400 feet wide, the width being covered by three steel arches over 100 feet in height, and the central transept, 130 feet wide, will be surmounted by three domes 250 feet high. The iron and steel will be rolled at the Reading Rolling Mill, but the fabricating and fitting will be done at Pottstown. The whole is to be completed and in place by May, 1892.



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