

**GEARED PENDULUM AIR PUMP.**

The loss of power in the use of a fan or blower is acknowledged to be very great, even at small pressures; and as soon as a larger pressure, say  $1\frac{1}{4}$  pounds to the square inch, is desired, these kinds of machines will be found wanting, no matter how large a size should be procured. But there are a good many processes in the manufactories where streams of air under pressures from one to thirty pounds are required, or where the air has to be exhausted, or a certain gas or vapor has to be transferred from one receptacle to another. In all such cases only a regularly made air pump with light-closing piston and its automatic inlet and outlet valves can give satisfaction.

Mr. H. Weindel, of 405 North 4th street, Philadelphia, Pa., has devised the pump shown in our engraving to supply this want for small establishments, which generally do not even have their own steam, but rent power in some large building, and have control only of a certain length of shafting, running at a given speed, and to furnish a pump that could be put up without extra expense, and started or stopped as necessity required.

There is on the top a countershaft with tight and loose pulley, flywheel, and two pinions. These latter gear into larger gear wheels provided with eccentric holes, in which the double-acting air cylinder is hung and perfectly balanced by counterweights provided on said gears. These, in their turn, are pivoted central on two rock-shafts, in which, on their upper end, the journals for the countershaft are provided. By turning this the large gears acquire a rotary motion, and as the cylinder can only move straight up and down between its guides the rock-arms will receive a pendulum motion, taking the gears with them. As thus, cylinder, crank-wheels, and rock-shafts have practically to fall a certain amount toward the end of each stroke and to be raised this same amount as long as the pressure is small, this goes a great deal toward equalizing the strain on the belts, giving a very steady motion to the pump. The outlet as well as inlet being stationary, the machine can be connected with receiver by rigid metallic pipes. The principal dimensions of the particular size illustrated are: Cylinder, 4 inches by  $5\frac{1}{2}$  inches stroke; double-acting inlet,  $\frac{3}{4}$  inch; outlet,  $\frac{3}{8}$  inch; countershaft,  $1\frac{1}{8}$  inches diameter; flywheel, 12 inches diameter; pulleys, 2 x 6 inches; speed of countershaft, about 260 revolutions; of pump cylinder, about 190 strokes, corresponding to 85 revolutions of crank-wheels per minute. Weight of whole machine, 130 pounds.

These machines can be built in the manner illustrated for low pressures, at least with cylinders up to 11 inches diameter; if required larger, the pulleys and belt would become too heavy. Then a steam cylinder is provided, preferably on the top, firmly connected with air cylinder by its piston-rod. The crank-wheels in this case have to be changed to fly wheels (same as on Mr. Weindel's hand pumps), and the rock-shaft is made use of to operate the valve gear in a manner similar to the engines on our side-wheelers.

**IMPROVED IRON PLANER.**

We give herewith an engraving of a very substantial and convenient iron planing machine made by the National Tool Company, of Williamsport, Pa. The planer is from new patterns of modern design. It is made very heavy and strong, the metal being so disposed as to resist the usual strains to which such machines are subjected. It has a very heavy table, with the slots planed true and very deep, allowing the surface to be planed many times before getting too thin above bolt heads. The pin holes in table are all reamed to standard size. The uprights are very strong and bolted to bed by heavy bolts, besides being firmly held to place by taper keys driven in suitable key ways where upright and frame join. The crossbar is also very heavy, and being provided with suitable gearing is easily raised and lowered. The frame is deep and well provided with cross-stays. All gears and racks

are cut, and the pinions are of steel. The shafts are heavy, and the bearings are unusually long. The planer has cross, down, and angular feed, and is provided with an improved belt shifter, which shifts one belt from the tight pulley before the other engages it, reversing the table very quietly without shock or squealing of belts.

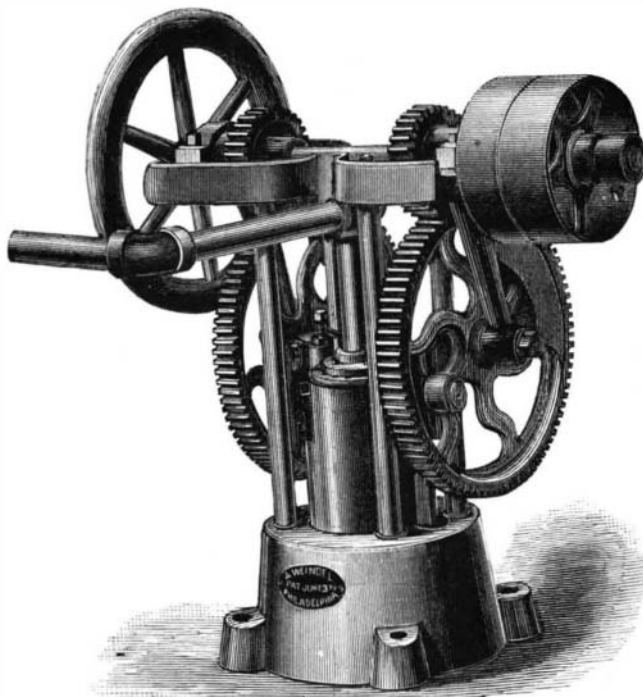
This machine has a friction feed running free, except while feeding, causing no friction or loss of power. By a simple device the table may be run back, to measure or examine work without moving the dogs, which every machinist knows are sometimes difficult to get exactly in the right place. When planing angles with the tool head thrown from operator, the tool may be fed down by the handle on the splined cross shaft. The machine is adjustable for a fine or

very coarse feed, and is easily changed while it is in motion without the use of a wrench.

This machine planes 31 inches wide, 30 inches high, and 8 feet long. The same company also make a machine to plane 36 inches wide from same patterns, at a slight additional cost. The company has the most flattering reports from users of the new planer.

**Recent Accidents with Electric Wires.**

While a fire company were going to a fire in Brighton, England, recently, the fire escape which they carried came in contact with an electric light wire overhead. The current followed the ironwork of the escape, giving the carriers a shock which made them lose their hold. Another mem-

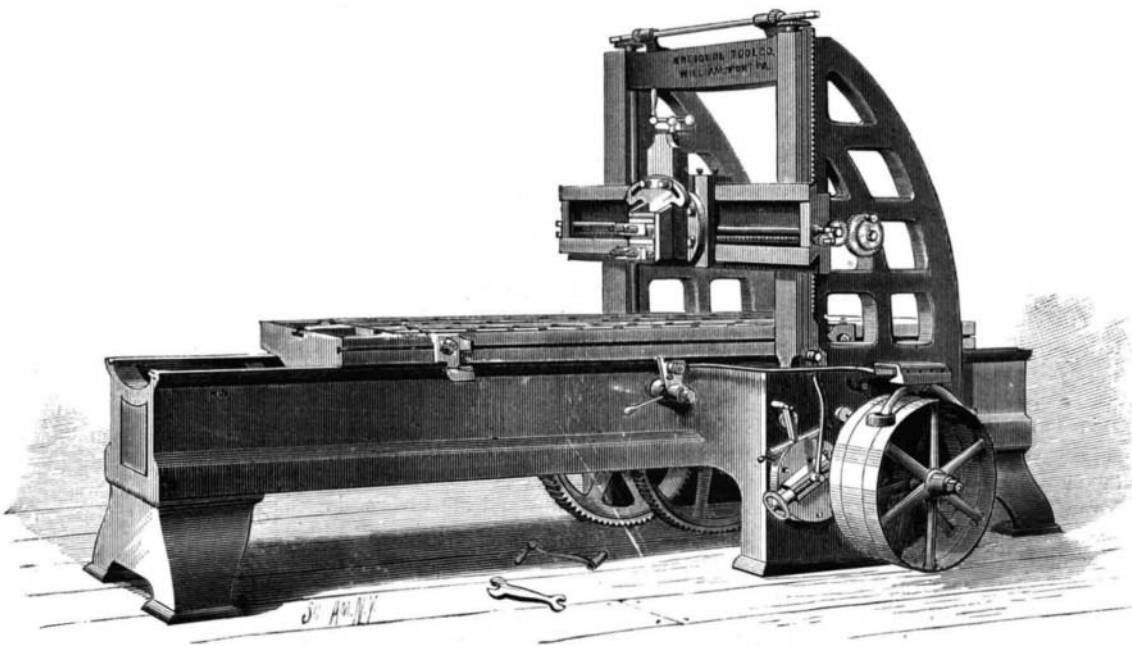
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ber of the company thought the machine was falling and grasped the steering rod to steady it, receiving a shock which disabled him for more than an hour.

More recently (August 6) there occurred at Paris a fatal accident, which suggests the use of electric wires as a bar to burglars. During a display of fireworks two men tried to climb over the railing of the Tuileries Gardens, when, laying hold of an electric wire used in the illumination of the grounds, both were struck dead instantly.

**Embalming the Unknown Dead.**

The authorities of Leadville, Colorado, have introduced the practice of embalming the bodies brought to the city morgue. The object, of course, is to facilitate the identification of the unknown dead, should inquiries concerning them be made within a year or two. *The Chronicle*, speak-

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ing of the large number of cases in which legal complications have arisen through the lack of means for such identification, says that it is astonishing how many missing young men, belonging to good families in the East, are constantly inquired after there. Letters of that character are received by city and police authorities, ministers, and undertakers daily, but in most instances there is no clew. People come there from their Eastern homes with no definite object in view, probably spend their means in dance halls and gambling saloons, fail to obtain employment, and are too proud and sensitive to write home for assistance. They drift into the mountains as prospectors, or into neighboring mining camps, and perhaps die of disease or accident. Thus swells the great army of the missing.

**Causes of Typhoid Fever.**

A severe outbreak of typhoid fever which occurred last year at Nabant, a rocky peninsula near Boston, inhabited during the summer by a small number of very rich cottage owners, was followed by an investigation, of which the results are made public in an article by Mr. E. W. Bowditch, in the *Boston Medical and Surgical Journal*. In such cases contamination of drinking-water is usually the principal cause of the spread of the disease, and the wells and cisterns which supply the houses were first examined. Water was taken from one hundred and ninety of these and analyzed. Eight of the samples were pronounced "excellent," and seventy-one others "permissible," or "good." One hundred and eleven were classed as "suspicious," "very suspicious," or "bad." About eighty cases of fever occurred, nearly all of which could be accounted for by the actual condition of the drinking water used in the houses inhabited by the patients. In a few others the filthy surroundings furnished a probable source of infection, although the water appeared pure, as, in one instance, where analysis failed to detect any serious pollution in water taken from a well situated within ten feet of one leaching cesspool and fifteen feet of another, both overflowing, and of course ready to furnish an occasional supply to the well during dry seasons or under other circumstances. One or two more were probably explained by the fact that the ice used in the household was brought from a foul pond in the vicinity; and only one seemed quite inexplicable, unless perhaps the infection might have been brought by milk contained in cans which had been rinsed in foul water. Mr. Bowditch's suspicion, that the infection was communicated in certain cases by contaminated ice, is strengthened by the fact that a very severe and fatal epidemic of typhoid fever was unquestionably caused in this way not long ago at a seashore hotel in New England; and it is worth asking whether the public authority might not be employed with advantage in exercising some sort of surveillance over the collection and sale of an article which may become, and perhaps already is, far more dangerous than the trichinous pork or immature veal against which so many precautions are taken. In one place that we know of, says the *American Architect*, thousands of tons of ice are annually gathered at the very edge of an extensive and well-filled cemetery, which slopes somewhat rapidly toward the water; and we have seen the winter product of a little pool formed by the overflow of what was practically the drain of a cluster of squalid houses regularly sold to customers.

**Two New Antiseptics.**

M. G. Le Bon has just presented to the Academy of Sciences two new and very effective antiseptics, the glyceroborate of calcium and the glyceroborate of sodium. Both of these compounds have the advantages of being very soluble, destitute of odor, and free from all toxic action. When exposed to the air they both deliquesce with great rapidity, absorbing from the air an equivalent weight of moisture. Both alcohol and water dissolve twice their own weight of these salts. They are powerful antiseptic agents even in very dilute solution; the most effective in a therapeutic point of view appears to be the calcic salt. It is absolutely innocuous, and it can be applied in strong solution to so delicate an organ as the eye without bad results. In a hygienic sense both can be employed with advantage as disinfectants and as preservers of meat and other alimentary products. M. Le Bon has transmitted meat simply coated with a varnish of the glyceroborate to La Plata, and it has arrived in a perfectly fresh and sound condition. He thinks both salts will prove very useful as antiseptics in Lister's mode of dressing wounds.

**A Large Cattle Train.**

A "bull train," said to be the largest ever seen on the Yellowstone, arrived at Benson's Landing, Montana, in July. The train consisted of ten teams of threewagons each, drawn by nine yoke of oxen, making in the aggregate thirty wagons and 180 head of oxen. The freight is estimated to have amounted to 150,000 pounds, and the outfit exclusive of freight was valued at \$22,000.

A new observatory connected with the Yale Horological bureau is now substantially finished. The main building is a small square brick building two stories high; on each side is a round brick tower forty feet high. The core is of stone, laid with great exactness. The turret-revolving roof is of iron. The first heliometer is in position, and will be used in observing the transit of Venus in December.