SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XXX.—No 20. [NEW SERIES] NEW YORK, MAY 16, 1874. [$3 per Annum. IN ADVANCE.

THE DAYTON CAM PUMP.

Our engraving represents an improved direct and double acting steam piston pump, which, it is claimed, is absolutely positive in its action, simple in construction, and economical in the use of steam. The principal feature is the mode of working the steam valve by means of a cam bolted on the piston rod and moving with it. By the shape of this cam the stroke is rendered slower at each end, thereby giving time for the water cylinder to fill. A full stream is thus insured, and the pump is prevented from cushioning against the water when the cylinder is but half filled. The arrangement is such that the valve cannot be thrown into such a position as to shut off steam and stop the pump. The operation of the mechanism needs no further description, as the reader will readily understand the adaptation of the various parts to each other from an inspection of the annexed illustration. It will be seen that there are no dead centers and that the action is absolutely positive. The arrangement of the cam movement, in connection with the piston, causes the water valves to lift and to set easily and without jar, thereby saving the wear and tear of valves and seats. The maximum of speed is attained when the valves are lifted and the water is flowing.

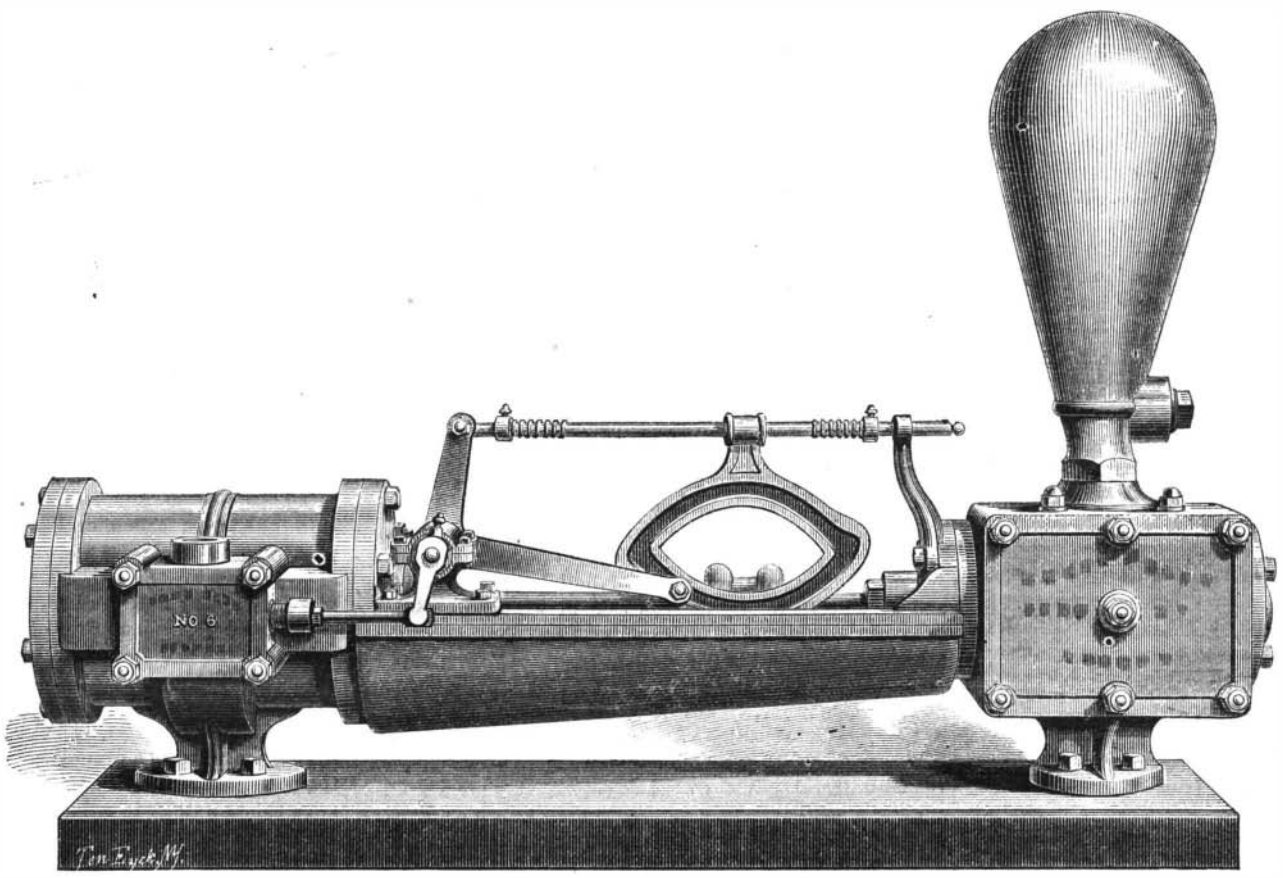
The manufacturers, in enumerating the various advantages of the apparatus, point out especially the simplicity of its construction, strong and durable material being used, and the various parts so constructed as to be readily accessible. There are no small intricate steam passages to fill up with dirt and grease, and the water valve chambers may be easily opened to reach the valves. The steam valve, being of the plain slide description, is also not liable to become out of order.

The pump, it is stated, will start at any part of the stroke, discharging the condensed water, and will lift either hot or cold water equally well, without change of valves. It can be used as a boiler feeder, or a fire and marine pump combined, and, it is claimed, will pump water at a temperature of 211°. Either water or steam pressure may be used as a motive power; a No. 2 boiler feeder, it is stated, has run at 25 double strokes per minute with only 20 lbs. water pressure. The steam cylinders are fitted with a patent metallic spring packing, and the water cylinders with a packing of linen rubber.

The boiler feeders are well adapted for forcing water under great pressure or to a high elevation. One pump of this description, the manufacturers state, fed water at 210°, from a heater, against 80 lbs. boiler pressure, and gained a medal over four competing pumps at the Cincinnati Industrial Exposition, 1873. For supplying tanks at railway stations, a compact steam boiler is furnished for driving the pump, the whole cost of the apparatus, it is stated, being less than that necessary to equip a station for pumping by horse power or caloric engine. The boiler is fed by means of a plunger pump attached to the piston rod of the main pump. The only difference, between the machines thus adapted and those above described as boiler feeders, is that the steam cylinders are much smaller, as it requires less pressure to do the work.

A class of low pressure pumps is also manufactured, which can be used in connection with a low pressure heating apparatus, thereby saving extra boiler and machinery. These are quite useful in case of fire, as the areas of the steam cylinders are as 9 to 1 of the water cylinders. The fire pumps constructed on the same general model are adapted for use in high buildings and for throwing water to great elevations.

The machine is well adapted for all the various uses to which steam pumps are applied, for employment in industrial establishments of all kinds, and for lifting oils, acids, and, in brief, any kind of liquid. It is manufactured by the Barney and Smith Manufacturing Company, car builders, Dayton, Ohio, an old and well known concern, whose excellent reputation is, perhaps, the best guarantee of the superiority of their productions.



THE DAYTON CAM PUMP.

THE HAMILTON SURFACE PLANER.

The improved surface planer herewith illustrated combines several new features which are intended to increase its adaptability to a large extent, making it (although a pony planer in size) a very useful labor and time saving machine. It has adjustable tables above and below the cylinder, which enable the operator to smooth and plane material perfectly straight and out of wind above the cutter head. The material may be subsequently planed from five inches to one sixteenth inch thick below the cylinder, thereby insuring straight, smooth and even surfaces, or it may be simply placed out of wind, to a thickness, or smoothed off at the will of the operator. This improvement enables the machine to perform a large variety of work, and allows of the finishing of pieces after they are framed together, dispensing with bench finishing to a great extent.

Fig. 1

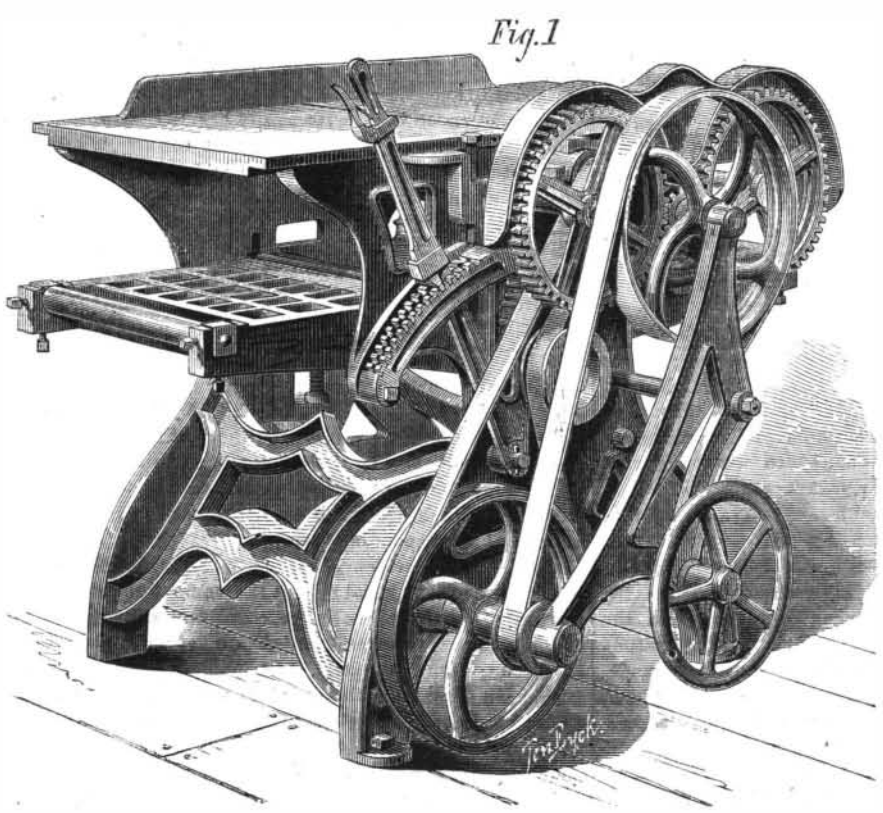
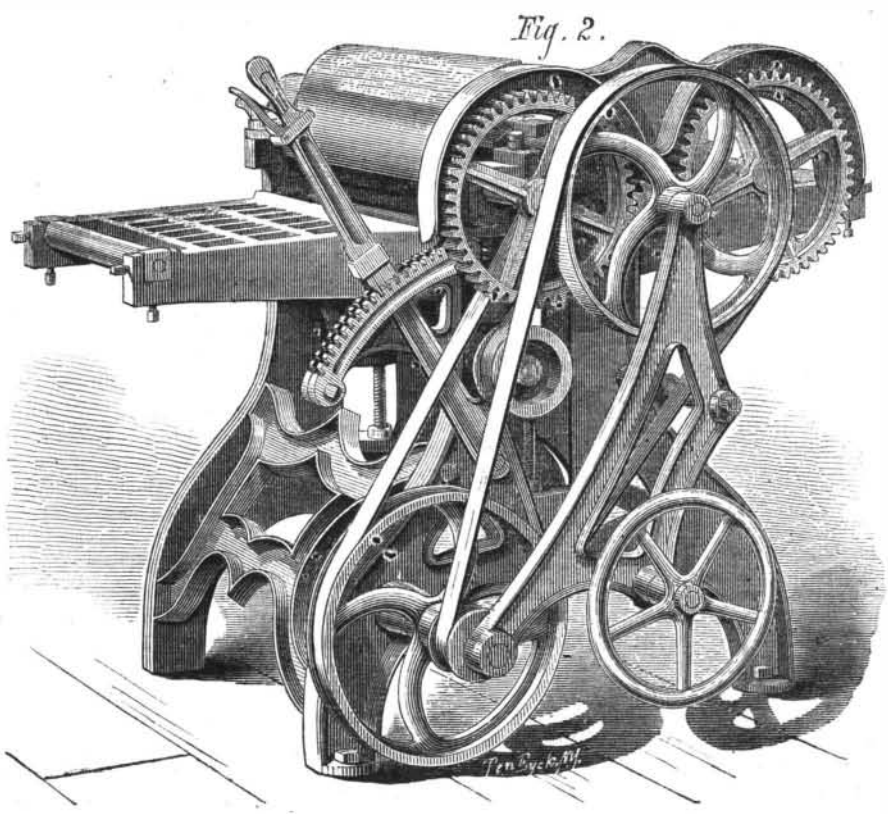


Fig. 2.



THE HAMILTON SURFACE PLANER.

Two different kinds of these surface planers are manufactured, with or without the attachment to plane out of wind above the cylinder. Referring to the accompanying engravings, Fig. 1 represents the surfacer, with attachment to plane above as well as below the cylinder. Fig. 2 represents the same planer without the attachment to plane above the cylinder, and only for planing below the cutter head. Three sizes of each of the two machines are made, to plane 24 inches, 20 inches, and 16 inches wide. The difference is only in the width, all working parts being the same. The frame of the machine is strong and heavy, the joints are carefully planed and then bolted together, and the table is cast in a solid piece, resting on two slides and screws, which are operated simultaneously by one hand wheel. An index attached to the table shows at a glance the different thicknesses to be planed, from five inches down to one sixteenth of an inch. There are six feed rollers, made of the best wrought iron, four resting in the solid table. The center feed rollers, of which one is fluted, are close to the cutter head, so that short as well as long material may be planed without clipping the ends. The gear wheels are very strong and are covered with a bonnet to keep them free from dust and shavings. An adjustable roller scraper is attached to the back feed roller to keep it free from gummy matter. The feed rollers are all adjustable, and the front and back pressure feed rollers are kept down by strong spiral brass springs, which can be easily adjusted and furnish an even yielding pressure. The pressure bar is also of a new construction and is held to its place and evenly forced down where the pressure is needed. The cutter head has a cast steel journal, rests in self oiling boxes, and is made with two or three knives, as may be ordered. The bonnet and feed roller apron can be swung to the side so as to enable the operator to sharpen the knives whenever necessary. The feed of the machine can be changed by a patent differential pulley, from fast to slow or *vice versa*, and started or stopped by means of a feed lever, which is of a new construction and very easily operated. The driving pulley on the cylinder is of five inches diameter and has a five inch face, and should make 4,000 revolutions per minute. The upper tables are adjustable, so that, in planing out of wind, a cut from 1-32 to ¼ inch can be taken on stuff up to 24 inches in width (the width of the cutting surface of the knives), or, in other words, stuff up to 24 inches in width can be planed out of wind, from 1-32 to ¼ inch cut at one time, passing over the cutter head.

Patented through the Scientific American Patent Agency, March 24 and April 7, 1874. For further particulars address Messrs. Bentel, Margedant & Co., Hamilton, Ohio.

Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS.

One copy, one year..... $3 00

One copy, six months..... 1 50

CLUB RATES { Ten copies, one year, each $2 50. ..... 25 00
Over ten copies, same rate, each..... 2 50

VOLUME XXX, No. 20. [NEW SERIES.] *Twenty-ninth Year.*

NEW YORK, SATURDAY, MAY 16, 1874.

Contents:

(Illustrated articles are marked with an asterisk.)

THE SEWING MACHINE MONOPOLISTS AGAIN AT WORK.

The sewing machine ring, not content with the enormous sums already extorted from the people, are again attempting to renew their power by lobbying a bill through Congress, which will extend their monopoly for seven years longer.

The A. B. Wilson feed patent was granted for one of the first abortive attempts to make a practical sewing machine; but so imperfect and crude was the model, filed with the application, that we doubt if any machine constructed like it was ever used. or was capable of being used practically. Yet as it happens that this is the first case in the Patent Office that shows an approximation to the modern feed motion, the patent has been construed by the courts to cover all styles of feeding devices in which the cloth can be turned around the needle, or in which the cloth is fed between two clamping surfaces. In view of these decisions of the courts, although the patent was granted for an impracticable machine, the Commissioner of Patents extended it for seven years; and Wilson, with an eye to the present application for an extension, immediately sold, for the comparatively insignificant sum of $50,000, all his rights to Messrs. Wheeler & Potter, as trustees for the Wheeler & Wilson, Grover & Baker, and Singer companies, and it has ever since been held and used in common by those companies as their most effectual instrument in monopolizing the sewing machine business, and in extorting millions yearly from the poorest and worst paid people in the land. On the strength of the small amount of money for which Wilson sold his patent, the combination now wants to have the privilege of plundering the people for seven years longer. In considering this sale of $50,000, it should be remembered that this valuable patent was not owned by a poor man who was obliged to sell his rights for a mess of pottage; the wealthy Wheeler & Wilson Manufacturing Company were doing business amounting to millions of dollars yearly, of which three fourths were clear profit; the patent was sold to the presidents of the Wheeler & Wilson and Grover & Baker companies as trustees for a combination of three corporations, of which the Wilson company was one of the most interested; that any capitalist conversant with the sewing machine business would gladly have purchased it by paying a double eagle for every dollar that Wilson is stated to have received; and that whoever owned this patent had the whole sewing machine business in his control, and could dictate his own terms as to royalty. In view of this, it is plain that the object of this sale was simply to form a foundation on which to apply to Congress for another extension to enable the owners of the patent to continue their extortions, and compel the poor seamstresses and other purchasers of sewing machines to contribute for another long period to the groaning coffers of these grasping corporations.

A few figures will show something near the amount that has been wrung from the people by these cormorants. The Singer machine is probably the most expensive one made by any of these companies, and that, as we learn by a sworn statement of I. M. Singer, costs, on an average, $11.83 to build. Those made by the other companies referred to cost much less; but we have been unable to find any reliable or sworn statement of the expense of building these machines, and we will therefore, for the sake of argument, estimate them at the same price. The plainest and cheapest of these machines are priced at $55 dollars each. If from this we deduct $25 as a fair selling price (which would be considered an enormous profit, in any other business, on a first cost of $11.83), we find that these companies have extorted from the people $30 on each machine they have sold, over and above the very liberal profit we have estimated above. These three companies alone, according to their sworn statements, sold, in 1872, 445,776 machines; and if one fourth of these were exported, the balance sold in the United States will amount to 334,332. Now multiply this by the $30 above the fair profit, and the product gives the enormous amount of $10,029,960. If, in addition to this, we deduct one fourth, for export, from the number of machines sold by the favored licensees of these companies, we have a balance of 289,788: and if we multiply this by the $30 as before, we have a product of $8,693,640, which, added to the above, will give us a grand total of $18,723,600 as the amount extorted, mainly from the poorest and neediest of the people of the United States, in one year alone, by the operations of this ring, who, not content with this wholesale robbery so far, want the privilege of continuing it seven years longer; which will enable them, without allowing for any increase of business, to bag the modest sum of $131,065,200, over and above an enormous legitimate profit.

That the extension asked for will be for the benefit of this ring of capitalists, and not solely for the poor (?) inventor and ostensible applicant, is clearly shown by an inspection of the before mentioned assignment, in which it is stated that "I have assigned, sold, and set over, and do hereby assign, sell, and set over unto said Wheeler & Potter * * * all my right, title, and interest in and to the same * * * *with all renewals, reissues, and extensions thereof.*"

From this it is very plain that the only object of this application is to renew the power of this formidable ring; and if the people generally do not stir themselves, this mighty incubus will be fastened on them for seven years longer, as the best of legal talent and the most influential members of the "third house" have been retained to work the case through. The sum of $50,000 has, we are credibly informed, been raised as a first instalment and sent to Washington to be "placed where it will do the most good;" and if the people do not let their representatives know their will on this point, it is possible that the weighty reasons of which the ring is so lavish will have their usual influence, and the people be obliged to endure another seven years' servitude to these wealthy extortioners; but if due efforts are made, the ring will undoubtedly suffer an ignominious defeat; and in the course of a year or two, as soon as manufactories now organizing are ready with their machines, the price of these necessary implements will be reduced to reasonable proportions, as machines can be built which may be sold at a good profit at from $15 to $20 each.

THE DEPRESSION IN THE IRON TRADE.

"The iron trade," says Mr. Samuel J. Reeves, President of the Iron and Steel Association, and also of the Phœnix Iron Works, the largest establishment in the country producing manufactured iron, "has not been so bad for fifteen years; and there is little prospect of improvement before the fall." Manufactured iron, according to the same authority, is a drug; the demand is less than that of three months since, and the delay of Congress to settle the vexed question of the currency, the late panic, and the strikes, past and impending, have, it appears, all contributed to produce a condition of affairs, in one of the most important branches of the national industry, which indicate widespread and alarming distress.

A brief review of the course of business during the past twelve months shows that, up to the summer of last year trade was quite brisk and iron in demand at moderate rates. The year bid fair to be a prosperous one until the opening of autumn, when a falling off took place, followed by the financial crash which blocked business. Still trade dragged on until February of the present year, when, in the opinion of some, a very slight improvement took place, and has continued: others however, maintaining that such is not the case, and for a reason point to the fact that the demand for manufactured iron is far below the average. A correspondent of the *Tribune* says that new railroad improvements are at a comparative standstill; railroads in operation are doing only a limited carrying traffic; the coal market is dull and flat, and operations in improvements are not by any means as extended as they have been. The product of rails at Pittsburgh is said to be not more than one fourth the quantity of the same period of last year—630 furnaces are out of blast in the State—and the antagonism existing between the Iron Manufacturers' Union, composed of capitalists on one hand, and the United Sons of Vulcan, of puddlers and boilers on the other, appears to be increasing, rendering labor troubles imminent, which must tend still further to complicate the unfortunate state of the trade.

In Pittsburgh, the iron workers are becoming restive under the reduction of 20 per cent in wages since the panic, and a strike is impending, the result of which cannot but be ruinous to the interests of both sides. The leading houses are not running at their full capacity, and declare that is impossible for them to raise the rate of wages because their margins are scarcely two thirds of what they were last year. To those who are working at a loss, strikes are a matter of indifference; but to such operators as are striving to lift themselves from the effects of the panic, the closing of the works will bring renewed distress.

In the eastern section of Pennsylvania, the points of dispute between employers and employed are the sliding scale of wages and arbitration. The workmen, the vast majority of whom belong to the union, demand that their wages be so adjusted that when prices of iron advance they shall participate in the manufacturers' gains, and conversely share in the losses in times of depression. The employers are opposed to these conditions and assert their right and privilege to pay the men such wages as they choose. Arbitration is a conference between a committee for the Central Union and the manufacturers, which aims to settle difficulties which may arise before a strike is resorted to. Eastern operatives, it is said, dislike the unions and the established scale. West of the Alleghanies, both are quite widely recognized. Thus affairs now stand, and it is to be hoped that an amicable settlement may in the end be reached, though at the present time none seems clearly apparent.

The reports in the English journals show that the British iron trade is suffering severely from foreign competition, and that it is probable that the advantage of the increased imports to us, necessitated by the difficulties in our domestic productions, will be secured by continental manufacturers to a much greater extent than by those of England. The *Ironmonger* affirms that iron making in Great Britain is not only profitless but attended with loss. A tun of rails made in South Wales and delivered actually costs $70.25, while at the present time they are sold at from $45 to $47.50 per tun. The slackness of orders necessitates taking them at almost any price to keep the works going.

It is also stated that never before has Belgian competition proved so severe. Bar iron from that country is offered in England at $52.50 per tun, which English masters could not furnish at less than $62.50. *Iron*, while admitting the state of affairs to be bad, predicted some time since renewed activity, owing to the falling prices of fuel; but in the latest issues received, the trade summary of that journal says that business is in a state of suspense, and will probably remain so until the prices of fuel and the wages question are again settled.

GLACIAL REMAINS IN CENTRAL AMERICA.

Until quite recently it has been thought that glacial action on any extensive scale was altogether a northern phenomenon its southern limit on this continent appearing to be about the latitude of Washington and St. Louis, and in the Old World a line of corresponding temperature, that of Paris and Vienna. Lately evidence has been accumulating to prove the prevalence of glacial cold at the same time, not only in the southern hemisphere but practically over the greater part of the globe. Professor Hartt has discovered glacial drift all the way from Patagonia, its supposed northern limit, to within ten degrees of the equator; while Professor Agassiz claimed to have found glacial moraines under the very line. The development of glaciers north of the equator was no doubt equally general, since their remains are found to be abundant where they might have been least expected, in the most central part of Central America. At Libertad, the