

# 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

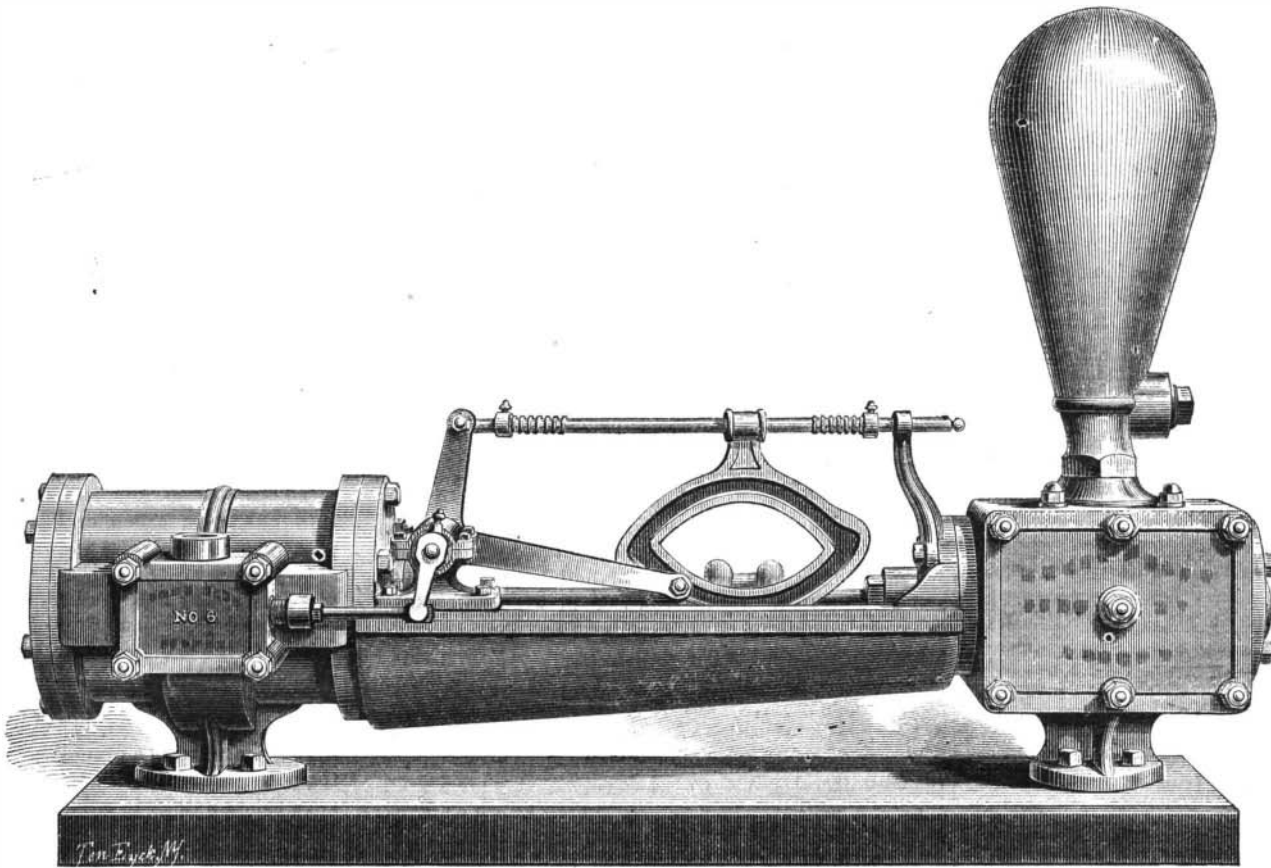
used as a boiler feeder, or a fire and marine pump combined, and, it is claimed, will pump water at a temperature of 211°. Either water or steam pressure may be used as a motive power; a No. 2 boiler feeder, it is stated, has run at 25 double strokes per minute with only 20 lbs. water pressure. The steam 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

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.



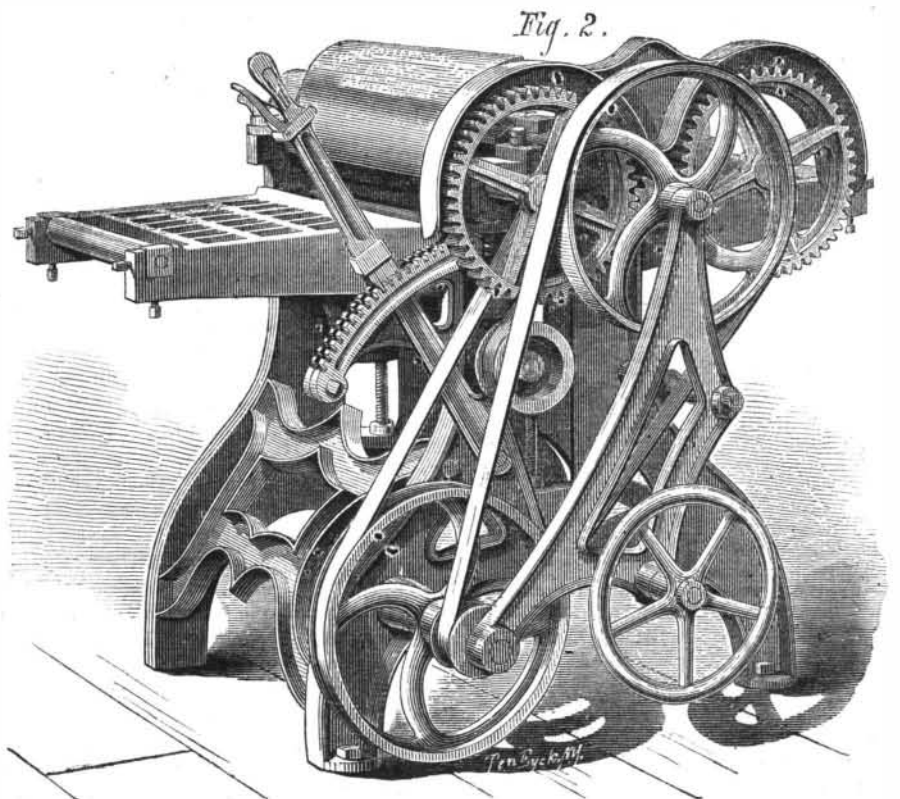
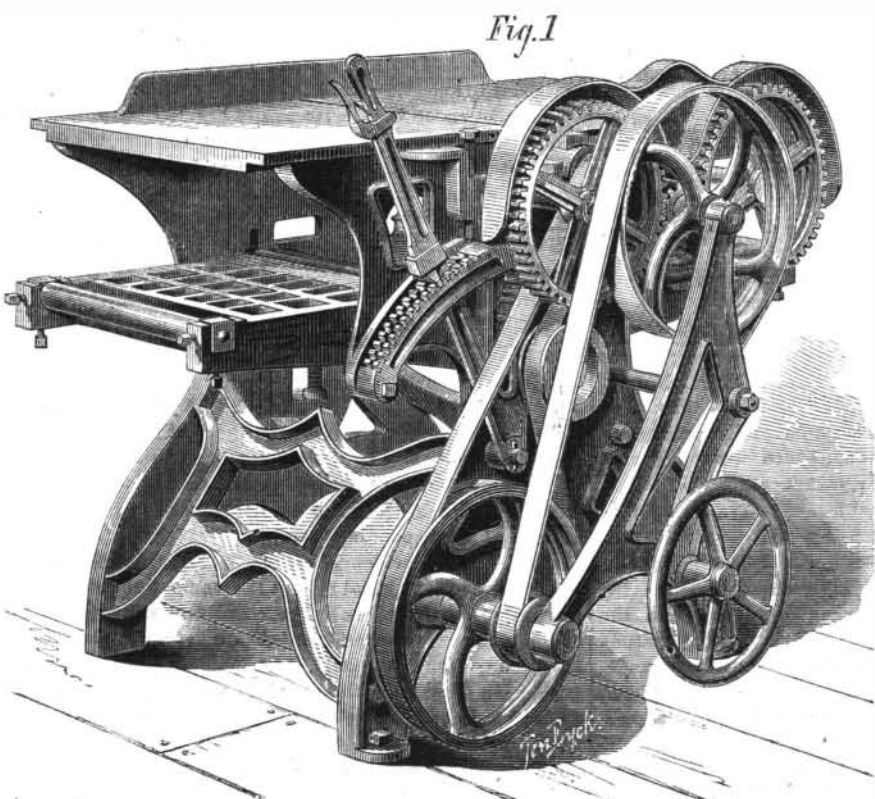
THE DAYTON CAM PUMP.

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 adap-

quently 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.

## 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 porty 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 subse-



THE HAMILTON SURFACE PLANER.