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THE AUGSBURG WEB PRINTING PRESS.

We gave a brief account about a month ago of the celebrated Walter press, two of which machines are now in operation in the establishment of the New York *Times*. The apparatus illustrated in the present engraving is a modification of the Walter invention, and is manufactured by a German house, the *Maschinenfabrik Augsburg*. The principal point of difference between this press and its English prototype is that the paper is taken from the under side of the web instead of the top, and is carried to the lower cylinders first instead of passing to the upper portion of the machine and thence down. This enables the whole printing part of the press to be kept lower, and consequently a somewhat different position is given to the distributing apparatus for the lower cylinder. The speed of the machine is about the same as that of the Walter, namely, 12,000 sheets per hour, though we are informed that, in the New York *Times* office, that of the latter has been increased to 17,000 sheets. The size of sheet is 20.67 by 30.31 inches, and of the type forms, 19.09 by 28.54 inches.

According to *Engineering*, from which journal we extract our engraving, the action of the Augsburg machine is very simple. The paper first passes through damping rollers, which can be arranged to give it any required degree of wetness; and then it makes its way, through rollers which are adjustable to regulate its tension, to the first type cylinder. The two type cylinders and the two impression cylinders lie in the same vertical plane. Their position is seen in the illustration, the lowest and highest cylinders being the type cylinders and the two middle ones the impression cylinders.

The paper is printed from stereotypes cast in semicircular molds so as to fit round the type cylinders. This method is adopted in all web printing machines, and by using it the fourths of type may last twenty years instead of two, while the actual printing is quite as clear and good as if it were done from the type direct. The paper first passes between the lowest pair of cylinders, and is there printed on the first side. It is carried upward and backward by the revolution of the lower impression cylinder, and passed from it forward again over the upper impression cylinder; and in passing between the latter and the upper type cylinder, it is printed on the second side. As these four cylinders are all exactly of the same diameter, and are placed close together, the printing on the second side must coincide exactly in its position on the sheet of paper with that on the first. The printing operation being now completed, the paper passes horizontally forward to the cutting cylinders. These are

placed at the same level as the upper type and impression cylinders, and are necessarily of the same diameter, that diameter being such that their circumference is exactly equal to the length of the sheet which is to form one copy of the newspaper. On one of the rollers is an ingeniously arranged cutter, and on the other, at a corresponding point, a kind of groove or seat for the projecting knife. As the paper on leaving the cutting cylinder is not led upwards at a steep angle as in the Walter press, it is not necessary to leave a small width on each side uncut, but the sheet is cut right across. The tapes, it will be seen, slope slightly upwards from the cutters in order to give sufficient height for the delivery apparatus. By an ingenious adjustment of their speed, the speed of each sheet is accelerated as it rises; so that by the time it reaches the delivery roller, there is a distance of several inches between it and the one next behind it. The delivery takes place downwards, and alternately to right and left on to the tables shown in the engraving, and the space between the sheets is necessary in order to allow time for the oscillation of the delivery frame. The apparatus for distributing the ink is very complete; that for the lower type cylinder will be seen behind and below it, and that for the upper type cylinder behind and above it. Just outside the frame which carries the cutting cylinders, there is an index, not shown in the illustration, which marks the number of copies printed as they are cut off. There are many interesting and ingenious details about the machine, but they are unfortunately of a nature which cannot well be made intelligible without the aid of detail drawings.

The Augsburg press was recently exhibited in the Vienna show, in company with two other types of web machines, the Victory and the Marinoni. The former is a folding as well as printing apparatus, and the latter has its special feature in a "divider" by the aid of which the sheets, after they are printed, are sent in four different directions.

Engineering states that since 1869 the London *Times* has been entirely printed from web paper, with a saving in working cost so great that the capital sunk in the displaced machinery was recouped in less than two years. The general catalogue of the Vienna exhibition, as well as several of the special catalogues, were printed on the Walter press in the office of the last named newspaper, and are noticeable, we believe, as being the first books printed from continuous paper.

The Walter press derives its name from Mr. Walter, M.P., the proprietor (the credit of its invention and construction being due to the manager and engineer) of the *Times*.

Small Swift Steam Propellers.

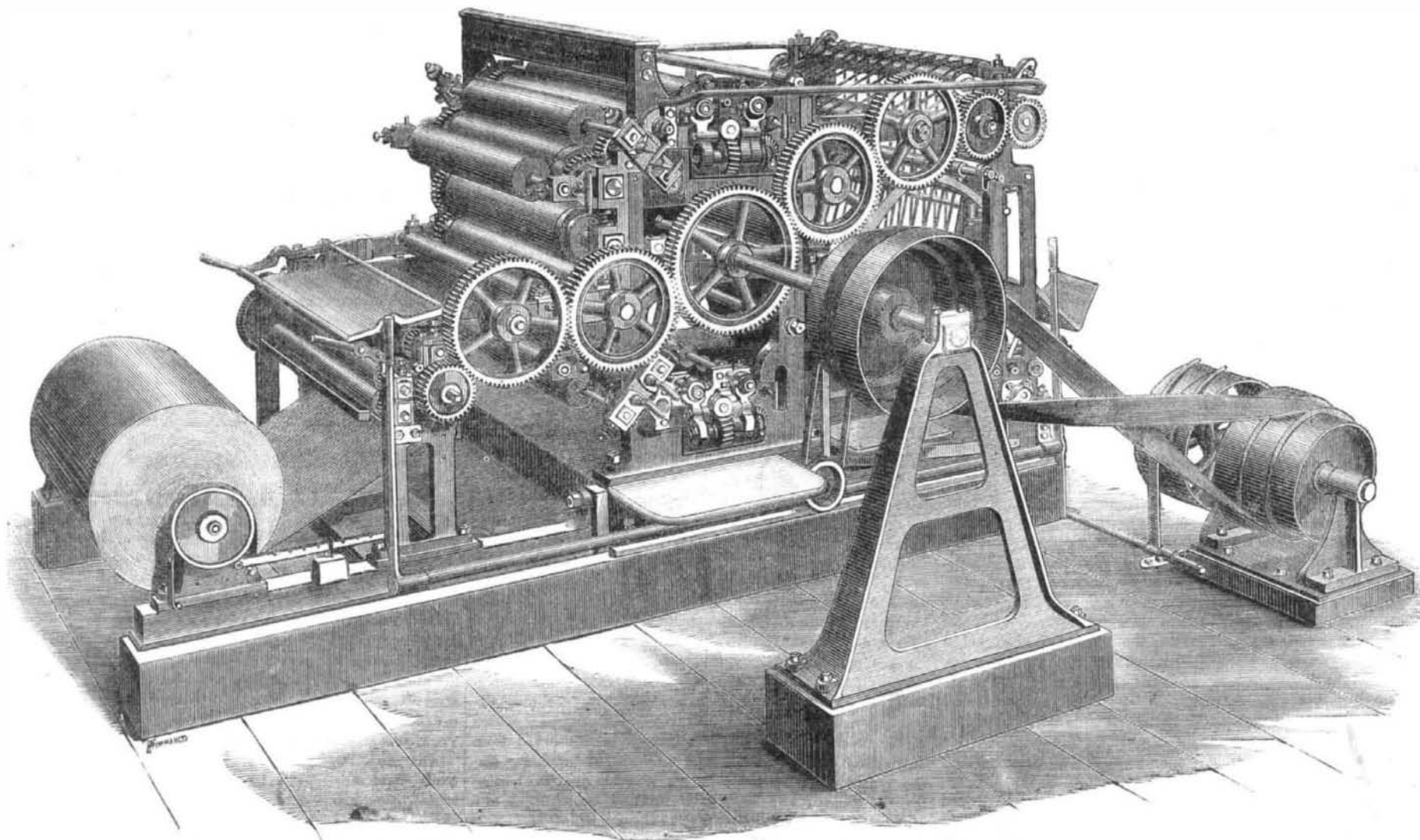
In our issue of July 6, 1872, there appeared a letter from Mr. A. Gray, of Burlington, Iowa, describing a small steam-propeller built by him for the Chicago, Burlington, and Quincy Railroad, and used to cross the Mississippi river between the above named town and the stock yards of the company. The boat, named the Robert Harris, is fifty feet long, of 7 feet beam, and draws about 30 inches aft and 1 foot forward. She has a locomotive boiler 11 feet long, with fire box 2½ feet by 3½ feet, with 27 two inch flues 7 feet long.

There are two direct-acting vertical engine cylinders, 5 inches bore and 10 inches stroke. The screw is forward of the rudder, and is 4 feet in diameter and has a quarter pitch. The engines are fitted with circular slide valves.

At the outset it was found that the vessel would run a full mile with three shovelsful of coal, and that, with 55 lbs. of steam and 104 revolutions, carrying 16 passengers, she crossed the river, a distance of ¼ mile, in 7 minutes; and returning, with 90 lbs. of steam and 140 revolutions, she made the same distance in 3½ minutes.

Mr. Gray has recently favored us with a second letter, in which he says that the above details, as published in our columns, brought him letters of inquiry from all parts of the civilized world, and even from such out-of-the-way localities as China, and Finland, on the northwestern border of Russia. He informs us that the boat has been running nearly every day during the past two seasons, and was most severely tested in stormy weather, besides encountering stone heaps, log piles, sand bars, and all the obstructions to be found in shallow water.

A few days ago, a formal examination of the engines was made. Not a moment's time has been lost, or a dime spent for repairs, since this boat came out in the spring of 1872; nor have the steam chests been opened. The valves proved to be as tight as when first fitted, not the slightest sign of "blow," or wear, being perceptible. The tool marks were yet visible, and they were not even scoured bright. The engines made 133 revolutions to the minute, with 80 lbs. of steam, which constantly rose while they were in motion, with a 4 foot propeller one third out of water, which makes her uniform speed about 15 miles an hour down, and 10 to 12 up, stream. She has passed every boat that competed with her. The river has been repeatedly crossed with 8 to 12 lbs. of steam, showing a remarkable contrast, in economy of fuel and steam, with a much smaller boat formerly used, having engines built from the same patterns.



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