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### Experiments with the Turkish Bath.

Some interesting observations were related at the last meeting of the British Medical Association, by William James Fleming, M.B. (Glasgow). These experiments were performed by the author upon himself, and consisted of observations on the effect of the Turkish bath at temperatures of from 130° Fah. to 170° Fah., upon the weight, temperature, pulse, respiration, and secretions. The results showed that immersion of the body in hot dry air produced loss of weight to an extent considerably greater than normal, amounting, on the average, to the rate of above forty ounces an hour. This was accompanied by an increase in the temperature of the body and a rise in the pulse rate, with at first a fall and then a rise in the rapidity of respiration. The amount of solids secreted by the kidneys was increased, and coincidentally the amount of urea. The sweat contained a quantity of solid matter in solution, and among other things a considerable amount of urea. The most important effect of the bath was the stimulation of the emunctory action of the skin. By this means the tissues could, as it were, be washed by passing water through them from within out. The increased temperature and pulse rate pointed to the necessity of caution in the use of the bath when the circulatory system was diseased.

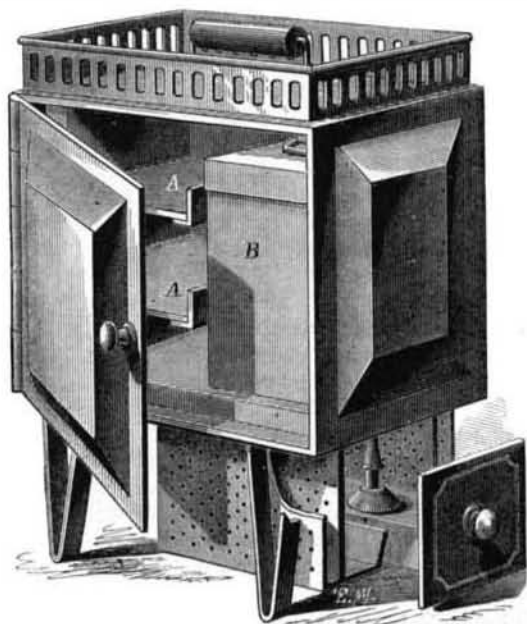
### IMPROVED PORTABLE LUNCH HEATER.

The annexed engraving represents a convenient apparatus for keeping a lunch or dinner warm while being carried from the place where it is cooked to the place where it is to be eaten, and for warming a lunch or dinner quickly, should it become cold.

A box, of rectangular shape, is provided with legs of convenient length. At A are shelves, the ends of which rest upon cleats attached to the box. A narrow space is left at one end of the shelves to receive a cup, B, to contain coffee, tea, soup, or other liquid. The bottom and one end of the box are made with double walls, to form a hot-air chamber for the heated air from the lamp to pass through. The lamp is placed in a chamber of perforated sheet metal, and is secured in place by flanged cleats or angle strips. To the

top of the box is attached a handle for convenience in carrying it; and also on the top of the box is attached a rim to form a tray to receive and carry knives, forks, spoons, napkins, and other articles.

This invention was patented through the Scientific Amer-



ican Patent Agency, September 18, 1877, by Mrs. Maria Bradley, of New York city.

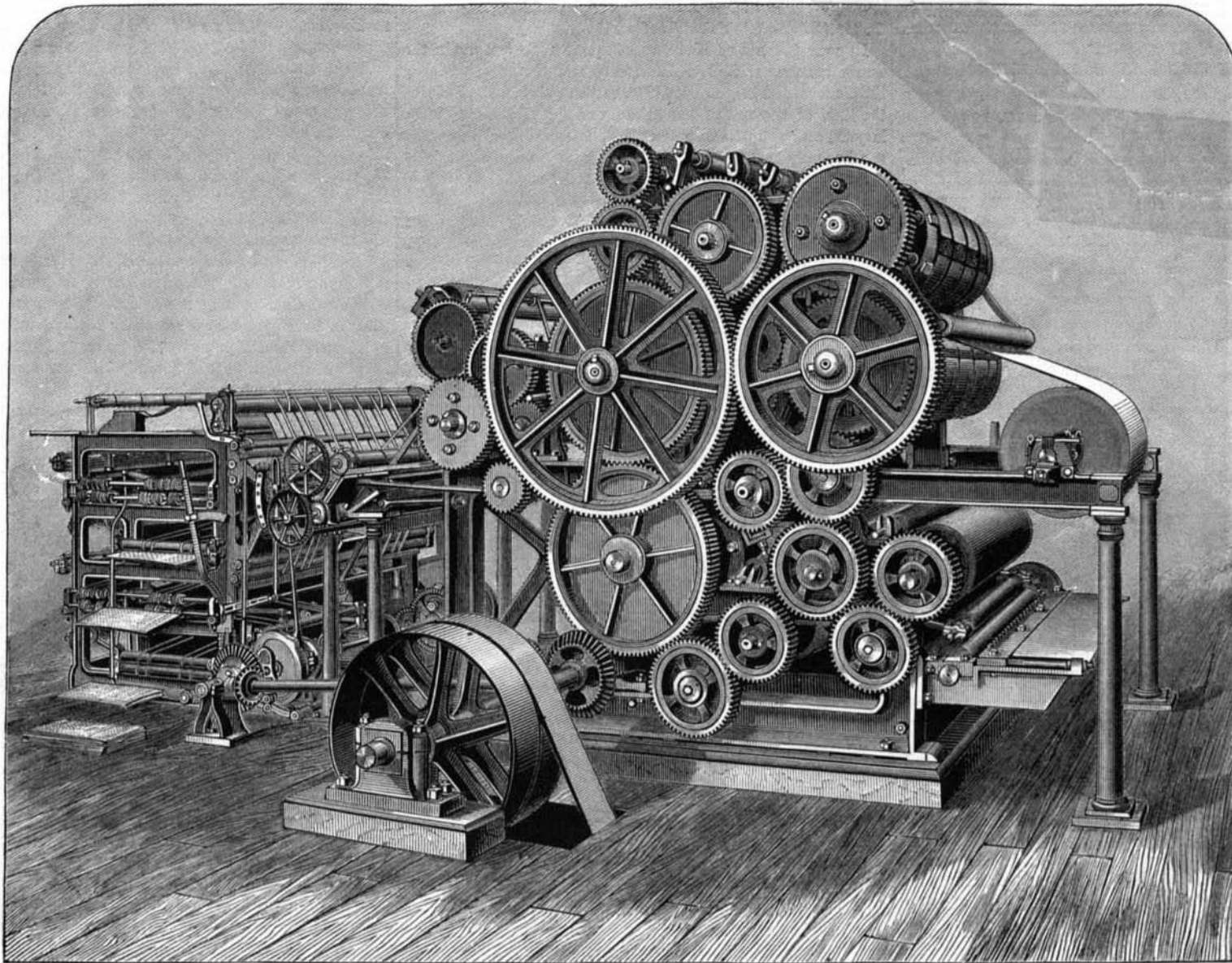
A GERMAN contemporary recommends etching with a preparation of 250 grammes of perchloride of iron, which is allowed to slowly decompose in half a liter of water. The advantage of this preparation is said to be that it has an effect on metals of all sorts without giving off noxious vapors. The object will need constant cleaning with a brush. The solution is rectified with oxide of iron when choked with metal; the etched ground is cleaned with turpentine.

### INGRAM ROTARY MACHINE FOR PRINTING ILLUSTRATED NEWSPAPERS.

We illustrate herewith the new Ingram rotary printing press, from which engravings are printed from circular forms. It is the invention of Mr. William James Ingram, M.P., the son of the founder of the *Illustrated London News*. It is now used for printing that journal, from the pages of which we take our engravings.

At one end is placed a roll of paper about three miles long; and the machine is no sooner started than the paper is caught in the first instance by the cylinders immediately above the reel, receiving an imprint of the inner letterpress form; thence it is carried diagonally downward to the picture cylinders which print the illustrations on the other side of the sheet; it is next conveyed to the species of guillotine which cuts each number to its proper size, and being carried therefrom by tapes to the folding machine, this finally delivers a perfect copy of the paper—well printed on both sides, and folded—at the rate of 6,500 an hour. One marked advantage claimed for this new machine is the great saving of time in making ready the illustrations for printing, from the fact that the cylinders are more rigid, and require a thinner “overlay” than any other machine we know. As for the letterpress form, neither “underlaying” nor “overlaying” is required, and the machine is constructed to work without roller lifts or bearers on either form. We may remark in further illustration of its many advantages over the ordinary press, that in the second week it was in use for printing a large issue its average work exceeded that of four of our fastest “two feeders”—a rapidity which may be realized all the more forcibly when we add that, whereas the new machine prints both sides of the paper, cuts each sheet, and delivers it folded, the old horizontal machines simply printed one form in the same time, and did not fold the sheets. There is thus a considerable saving of manual labor, only four men being engaged on the rotary machine, whilst twenty-four men were employed on the four machines. Let it be added that the “Ingram” machine only occupies the space of an ordinary perfecting machine; and little more

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INGRAM'S ROTARY MACHINE FOR PRINTING ILLUSTRATED NEWSPAPERS.

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need be said to prove that it bids fair to effect as great a revolution in the printing of illustrated newspapers as the latest Walter and Hoe rotary machines have effected in the printing of daily newspapers.

We may here quote from Mr. Ingram's specification to the Commissioners of Patents the passages referring to the principal improvements which he has introduced:

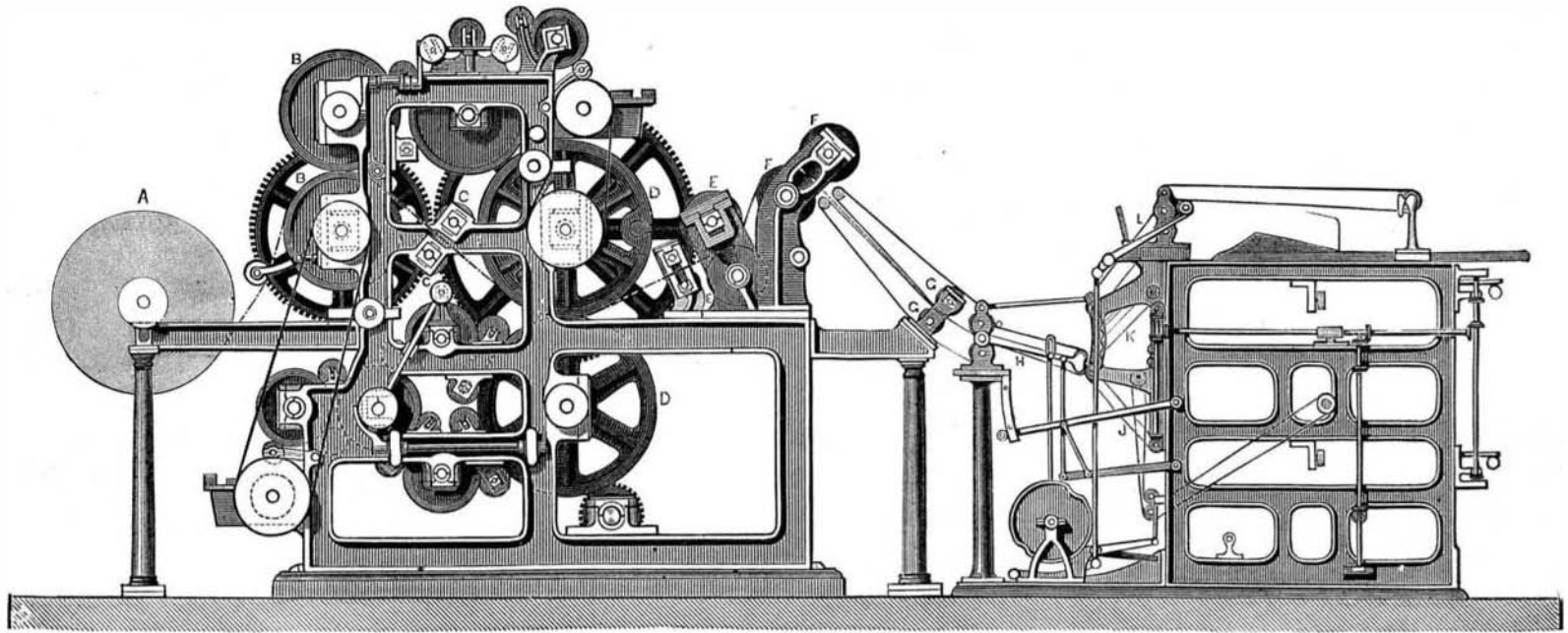
"It has been found in practice that 'cuts' or engravings require much more careful inking than the letter press, and that the ordinary inking arrangements, which are found to answer very well for printing letter press, will give but very imperfect work from engravings or cuts. It has also been wellnigh impossible to obtain satisfactory impressions from 'cuts' or engraved plates bent to the sharp curve required to correspond to printing cylinders of the ordinary size.

The large printing cylinders will therefore perform two thirds of a revolution while the smaller or type cylinder is making one complete revolution.

"My next improvement relates to the inking apparatus, which is used in conjunction with the large printing cylinder, and consists in the use of an increased number of inking rollers and distributing rollers, so that the engravings may be more perfectly inked than heretofore. The ink, as is usual, is transferred by a vibrating roller from the ductor or fountain roller to the first distributing cylinder, from which it is taken by two rollers, and is deposited on a second distributing cylinder, to which an endway motion is given by means of any suitable mechanism. The ink is thereby evenly distributed over the surface of this second cylinder, from which it is transferred by other rollers to two other distributing cylinders, in contact with which four

ing rollers, snatch or break the paper at the places where it has been perforated, and form it into separate sheets.

As it is found that machinery for folding newspapers works much better at a moderate speed, in this case it has been arranged in duplicate, so that each folder only works at half the speed of the printing machine. The vibrating arm, H, delivers the sheets alternately to K and J, which are carrying tapes leading to the two folding machines. If the sheets are wanted unfolded, the arm, H, is moved to its highest position and there fixed; it then delivers the sheets to the roller L, and, by means of a blast of air and a flyer, they are laid in a pile on a table provided for them. This change can be made without stopping the machine. Another machine, it is stated, is being constructed embodying further improvements which will make it possible to print two whole sheets and two half sheets of the *Illustrated London News* on the



INGRAM'S ROTARY MACHINE FOR PRINTING ILLUSTRATED NEWSPAPERS.

"In order to overcome these difficulties I considerably increase the diameter of the printing cylinder to which the 'cuts' or engraved plates are to be adapted, so that the curves to which these 'cuts' or engraved plates are bent may be gentler and of longer radius than the curved surface of the other printing cylinder. By this means I am also enabled to place on the same printing cylinder two, three, or more copies of the cuts or engravings, so that while the surface speed of the large and small printing cylinders is the same, the small cylinder, if it contains only one set of stereotype plates for the letter press, will rotate two, three, or more times for every revolution of the large cylinder. The impression cylinder, which acts in conjunction with the large printing cylinder, is also correspondingly increased in size, and rotates at the same surface speed. If desired, the type cylinder may be increased in size so as to be capable of receiving a duplicate set of stereotype plates for the letter press, while the large cylinder will have triplicate or other suitable number of sets of cuts for the engravings.

inking rollers rotate and take therefrom the ink, which they transfer to the printing surface. In this manner the cuts or engravings are plentifully and evenly supplied with ink, and good impressions are obtained therefrom."

We add particulars of the side elevation view, representing the action of the "Ingram" machine:

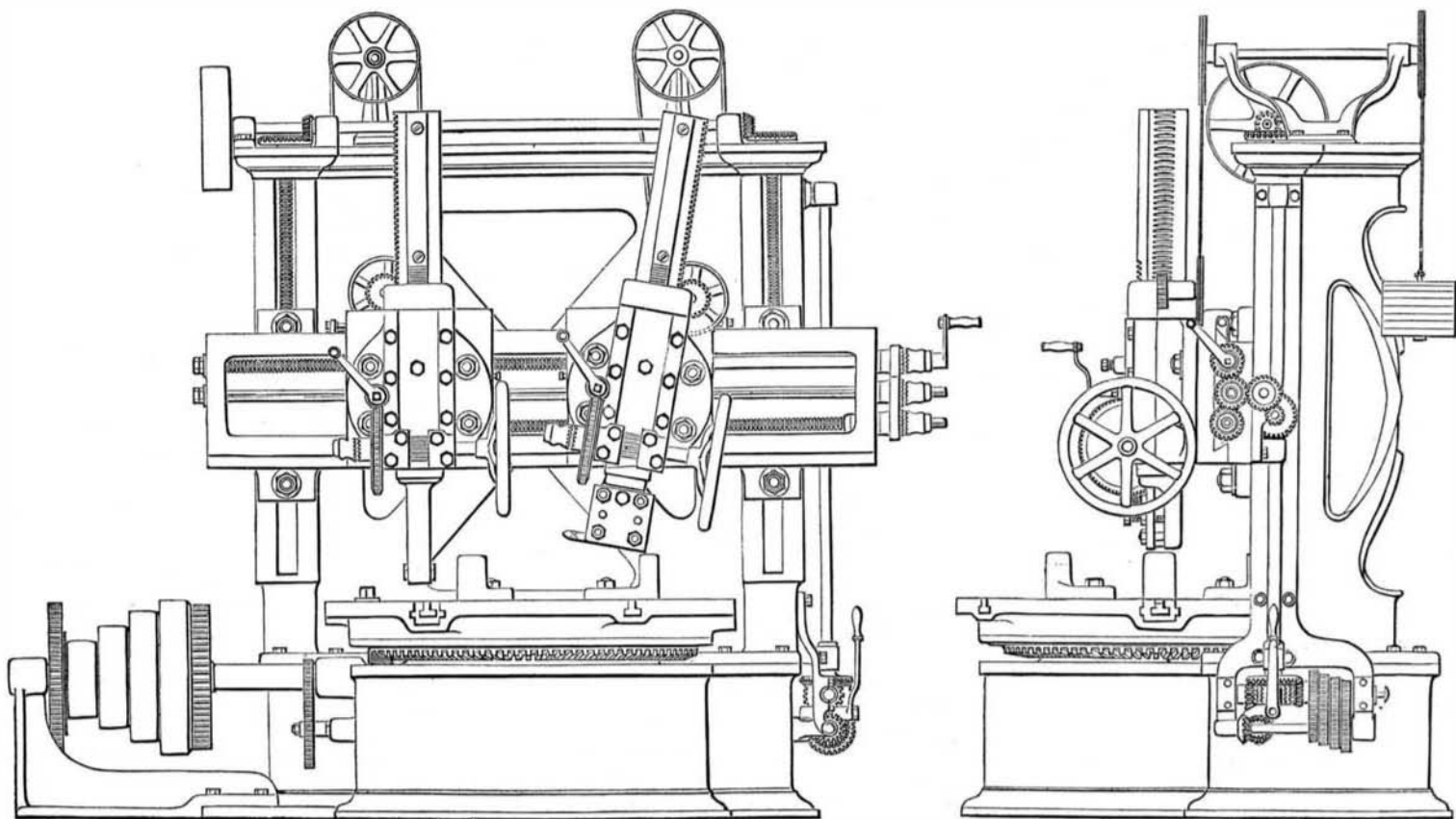
A is the roll of paper, containing a length of from two to three miles. B B, the type and impression cylinder for printing the inner form, or type side, of the paper. C C, calendering or smoothing rollers to remove the indentations produced by the impression of B B, so that a smooth surface is preserved to receive the outer form, or illustrated side of the paper, which is printed by D D. E E are cylinders, one provided with a saw-toothed knife, and the other with a corresponding indentation, to perforate the paper between each impression.

F F are rollers for holding the paper securely, to resist the effect of G G, which are called snatching rollers, and, being driven at a rather higher surface speed than the hold-

same machine. The size of the page of the *News* is about the same as that of the *SCIENTIFIC AMERICAN*.

**IMPROVED BORING AND TURNING MACHINE.**

We illustrate herewith a new combined boring and turning machine, constructed by Messrs. W. B. Bement & Son, of Philadelphia. The headstocks for the boring and turning tools are both mounted on the same carriage, which has a vertical traverse given to it, by means of the screw and bevel gearing driven off a pulley mounted on the horizontal shaft at the top of the frame. The headstocks can be traversed horizontally, or set at any desired angle, and the distance apart of the boring and turning tools can be regulated at will. The tools are fixed, the table on which the work is placed being caused to revolve by the gearing introduced, as shown. The weight of the boring and turning bars is balanced by counterweights passing over pulleys on the top of the frame, and the cutters are fed down to the work by a pinion gearing into the rack on the bar.



BEMENT'S BORING AND TURNING MACHINE.