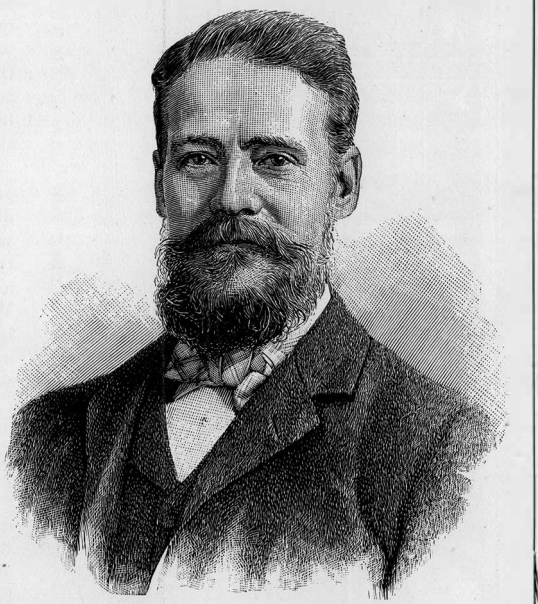
The Printer of "Black and White."

Printing an Art, not a Mechanical Operation.

That printing is an art must be admitted by all who are in any way brought into practical knowledge with the production of any high-class publication. We often hear the exclamation "How beautifully this is printed," and this, as a recognition of superior work, is an encouragement for further endeavour in the artistic development of fine printing. The general appreciation of the public for high-class work has stimulated the great printing and publishing houses to obtain high artistic finish in their various publications; but although many of the readers of the various weekly and monthly journals can distinguish readily high-class printing from bad, very few of them perhaps know or conceive the great amount of work, thought, and skill that is required to produce the desired result. In this short article, therefore, we purpose giving in a concise manner the various stages required for the production of a high-class illustrated journal.



MR. W. R. ORFORD.

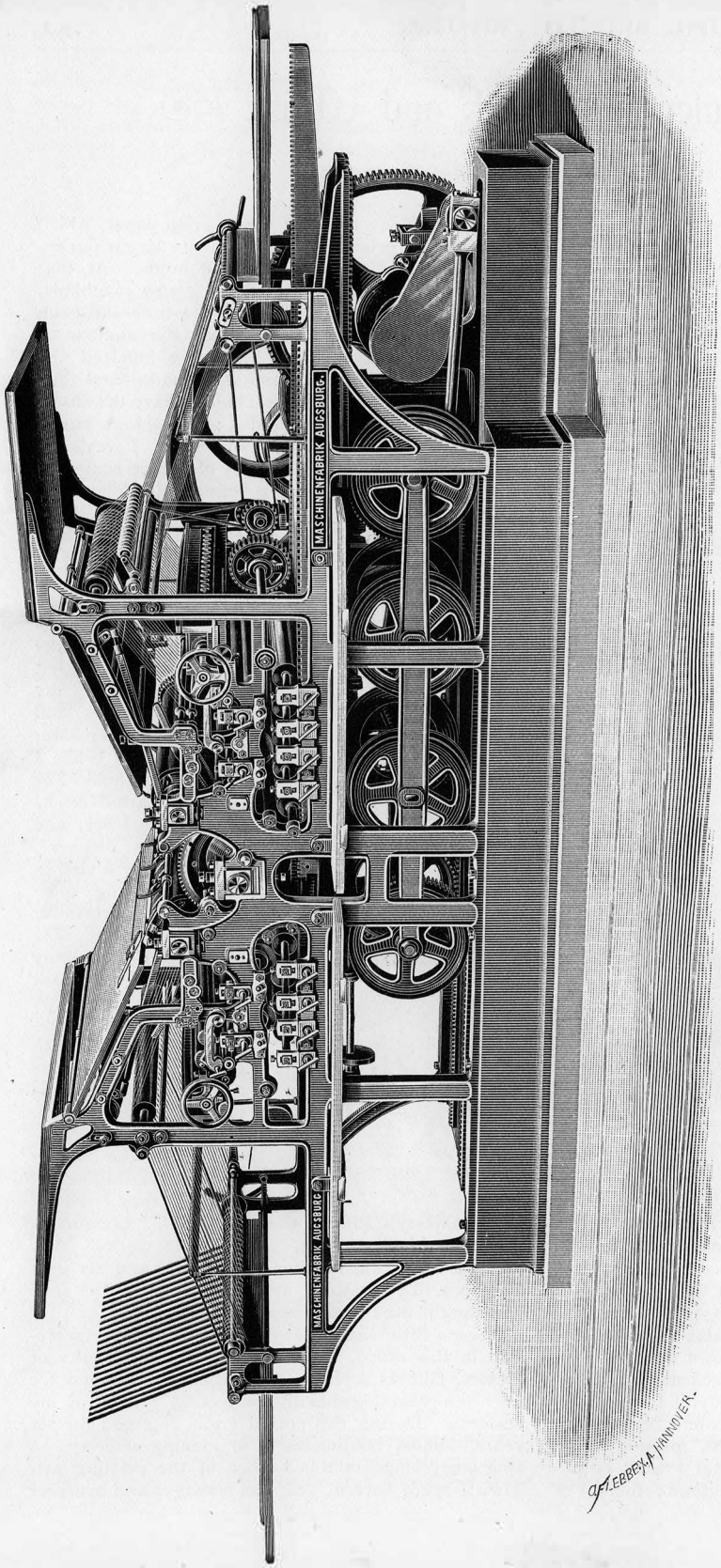
Caxton, we all know, was the father of English printing, and marvellous results were indeed obtained from the primitive and tedious methods then available; but to describe the historic growth of the printing press from his day to ours would take up too much space, and be but dry matter for our readers. Let us, therefore, commence at our own day.

The printer is like any other artist. "The boy is father to the man," or "the student father to the professor," for, as the apprentice in printing has profited by his experience, so will his value as a master be. As Mr. Orford says, to quote his own words:—

"My experience of printing goes back more years than I care to count. I started as a boy of ten years of age, when my first work was in connection with an edition of Longman's 'Testament,' printed by Clay, Sons & Taylor. Two years later I went into the printing office of the Bank of England; there I fed the machines with the clean, crisp paper, which went into the printing press in all its virgin purity, and emerged in the form of bank notes. At that time these notes were printed on *platen* machines, which only printed the body of the note—as each sheet was printed a dial indicated the number of impressions taken, and at every five hundred the dial was checked and a fresh start made—and then passed to a single cylinder machine to have the dates, numbers, and signatures added; but things move, and when I revisited my old office some few years back I found that a machine had been designed to combine all these operations in a single working.

"After several years in the Bank of England's printing works I returned to Messrs. Clay & Sons, my former employers, and settled down to master my business. While I was with them *The Graphic* started on its successful career, and I had the pleasure, although only a youngster, of making some of the first overlays for number one of *The Graphic,* and for many months had to work two whole nights, on Tuesdays and Thursdays, in addition to the usual sixty hours a week—for there was no nine hours then. 'Clay's' at this time was one of the leading houses for high-class work; they printed 'Her Majesty's Life in the Highlands,' 'Longman's Ten Guinea Testament,' and similar works. Mr. Richard Clay (the founder of the firm) and his sons were practical printers, and it was one of the sons who taught me to make my first overlay.

"Some little time after completing my apprenticeship in this office, I entered the printing works of Messrs. Gilbert & Rivington, where I remained for over ten years, gradually perfecting myself in my business. During this period I was engaged for six years, almost continuously, in making overlays—a long experience in this branch of the printing art. Then I spent several years as manager and overseer



THE NEW TWO-FEEDER FOR "BLACK AND WHITE."

in various well-known houses, in one of which there was fitted up a large printing establishment, with all the latest improvements in English machinery, and of which I had the entire management. Later on I was with Messrs. Virtue & Co., Limited, who have turned out some of the finest printing possible; and afterwards I accepted the management of the printing department of the *Black and White* Publishing Co., Limited, which I joined at its inception, and hope to be connected with for a long period."

Having thus introduced Mr. W. R. Orford to our readers, to which we add his portrait, we will now describe the various stages through which the publication of a high-class illustrated journal has to proceed, so that our readers may judge somewhat of the care, skill, and thought necessary to produce a satisfactory result. Let us take the letterpress work first, that is, the type.

The manuscript of the various editorials, articles, stories, etc., are handed to the compositors, who proceed to set them up in type in single column width and about two columns long. When each manuscript is set up in type, a rough proof is taken and it goes to the reader, who carefully corrects the compositor's mistakes and sends it back to the compositor for correction, after which a second proof is taken, which is submitted to the author and editor for revisal and alteration, after which a third proof is made and re-read, and finally a proof passed upon by the editor.

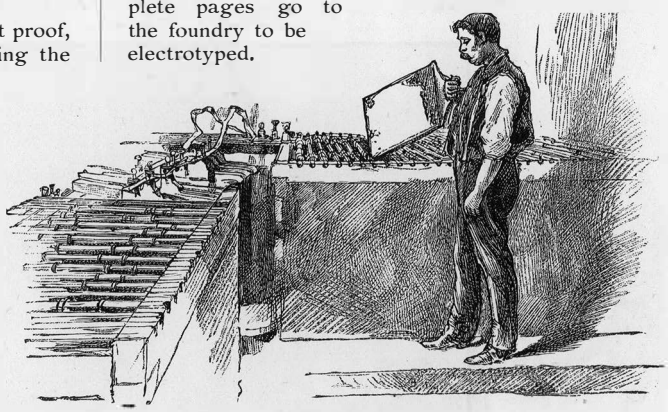
Many printers are inclined to ignore the compositor in high-class work, and look upon him as somewhat of a mechanical automaton. This is a mistake, for, like every other work done by human hands, intelligence and experience will always produce superior results, and the display of type can sometimes be made quite artistic, and several classes of work can only be entrusted with satisfaction to almost geniuses in the art of type display.

There have been a great many mechanical inventions patented for taking the compositor's place, but none have yet been so eminently successful as to replace the compositor, except to a limited extent in plain bookwork and newspapers.

Whilst the editor is carefully revising the last proof, let us glance at the best methods of preparing the illustrations to accompany the letterpress.

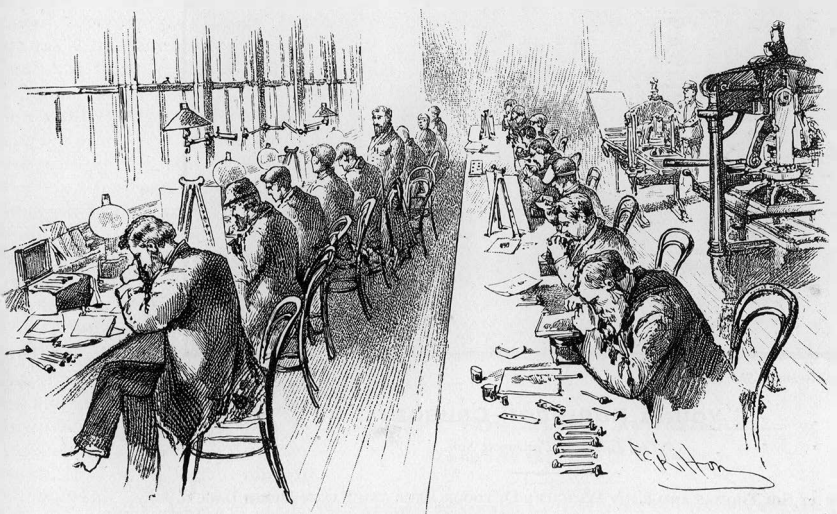
To give in detail the many processes by which artists' sketches are transformed into printing blocks would, we fear, weary the reader, and be of too technical a nature to be readily understood by the general reader. One of the chief means used is the father of all—viz., wood engraving. Let us follow the engraver at his work. First of all, pieces of boxwood are screwed together equal to the size of the required sketch; for a large sketch as many as twenty or thirty pieces of wood are used; then it is planed and polished to a very fine surface, and coated with a photographic preparation, and the sketch is photographed on to the boxwood. When this operation is completed, the various pieces are unscrewed, and each piece is handed to an engraver, and by this means a large engraving is prepared in ten or twelve hours, which, if worked at by one man alone, would occupy as many days.

The separate parts of the engraving, being finished, are again screwed together and touched up, when it is ready to be electrotyped. When, however, the illustrations to be engraved are the ordinary small sketches to a story, one engraver will probably finish it by himself; then proofs are taken and sent to the editor. This gentleman now has, as we have seen, proofs of the type of the story and proofs of the illustrations. If all is right, he then makes the story up into the form of pages, pasting the copies of the sketches where he wishes them to appear. These rough pages then go back to the compositors, who place the wood engravings in the positions marked by the editor, and run the type round them, thus forming complete pages. Further proofs are again made, and if all is in order, the complete pages go to the foundry to be electrotyped.



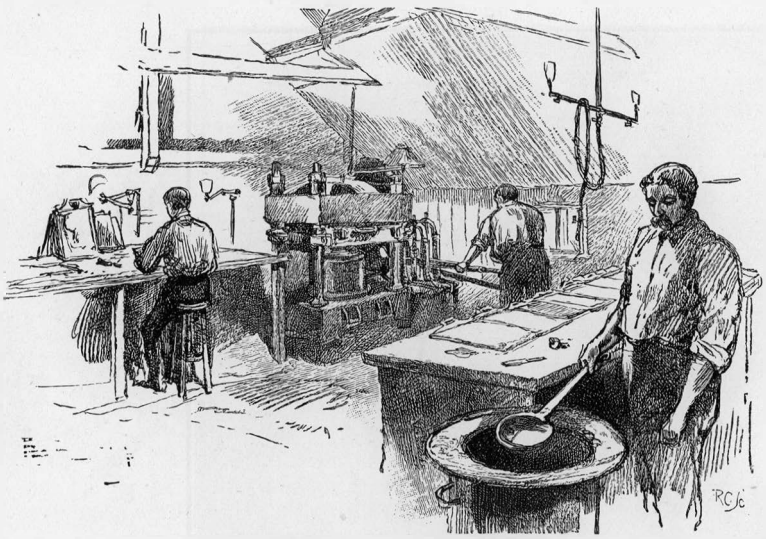
THE BATTERY.

This special branch of the printer's art is very interesting. The pages of type and blocks are thoroughly cleansed, and pans of melted wax having been prepared, the pages of type are placed face downward on the wax, which has been coated with a very fine preparation of plumbago, and the whole placed under a hydraulic press capable of exerting a pressure of two or three hundred tons. By this means a perfect replica of the typed page and its blocks are reproduced in the wax mould. The mould is now carefully polished with plumbago, and is then ready for the copper bath. This bath is usually worked on the same principle as electro plating, except that copper is the metal deposited; under the action of the bath the wax mould gradually grows a copper surface on its plumbagoed side, and when the deposit of copper is of sufficient thickness, say in about eight hours, the wax mould is withdrawn and placed in the sink, and boiling water poured over it, melting the wax away and leaving a copper casting which is an exact reproduction of the original type and wood engravings. By the use of a dynamo this copper electro can be grown in half the time. As, however, this shell of copper is very thin, it has to be strengthened; so away it goes to the finishing room, and melted lead is poured into the inner side of the shell, filling up all the interstices, and after being turned in a lathe and planing machine and the superfluous lead planed off and finished to a standard thickness, the plate, as it is



THE ENGRAVING ROOM.

now termed, is ready for the printing machine. Great skill and care is requisite in all the operations which the plate undergoes, otherwise we should have imperfect printing through faulty workmanship.



A CORNER OF THE BLACK SHOP.

Someone may ask, "Why take all this trouble to make an electro plate, when the original type and blocks could be used?"

The reason is that continual use of the type would soon wear the sharp edges of the letters down, and, after a few editions of the paper, the whole beauty and clearness of the printed impression would be gone; then, again, the wood engraving blocks would split, the joins of the wood would show, and the result would be anything but satisfactory. Then, again, in order to get a weekly issue out in regular time several complete copies or sets of the type and illustrations have to be used, and so duplicates of the plates are required.

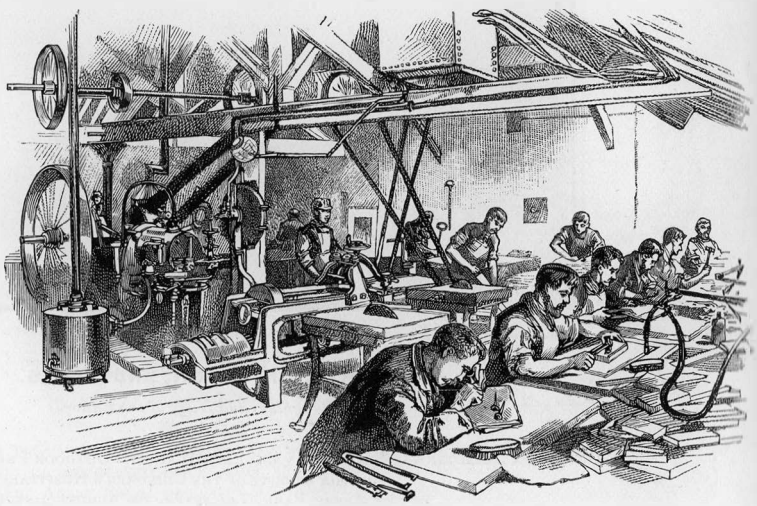
There is another process for reproducing the facsimile of the type in page form; this is called stereotyping. For this, a plaster of wet paper is laid on the face of the type and is beaten into it with a brush. When a perfect mould is obtained, it is dried and hardened, and then it is placed in a casting-box and hot lead is poured into the mould. It is afterwards finished off by the lathe and plane, as in the electro. This process is cheaper than electrotyping, but is not available for illustrations, as the surface is not sufficiently hard or sharp.

The plates being now ready for the machine, a skilled metal engraver goes all over the engravings and touches out any imperfections, and they are then sent to the printing room.

Let us look back now at the work through which an illustration has gone. First, a double page of *Black and White* can be engraved in twelve hours, by distributing it amongst twenty or thirty engravers; then, by the aid of the dynamo in the electro bath, we can grow an electro of this size in six hours; finishing the electro in the foundry, and touching out ready for the machine, would occupy a further eight hours; so that we have the electro block ready for printing within twenty-four hours of its receipt from the artist.

We now come to that department of the printing establishment which, to the writer, is the most interesting part.

Besides wood engraving there are now largely in use various photographic processes of engraving, producing most satisfactory results, and largely used by the trade. Those mostly in use are the half-tone blocks, which reproduce exactly the original photograph, and which, if very carefully executed from good originals, produce most excellent results at considerable reduction from the cost of the artistic handwork of the wood engraver.

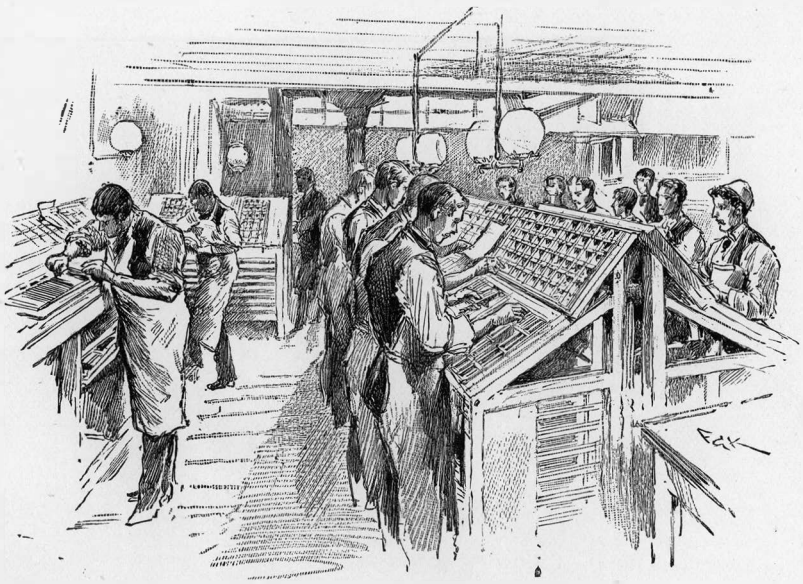


THE FINISHING ROOM.

The home of all process work was originally Germany, but we are only rendering proper justice if we acknowledge that in America this work is carried to a degree of excellence perhaps unequalled elsewhere.

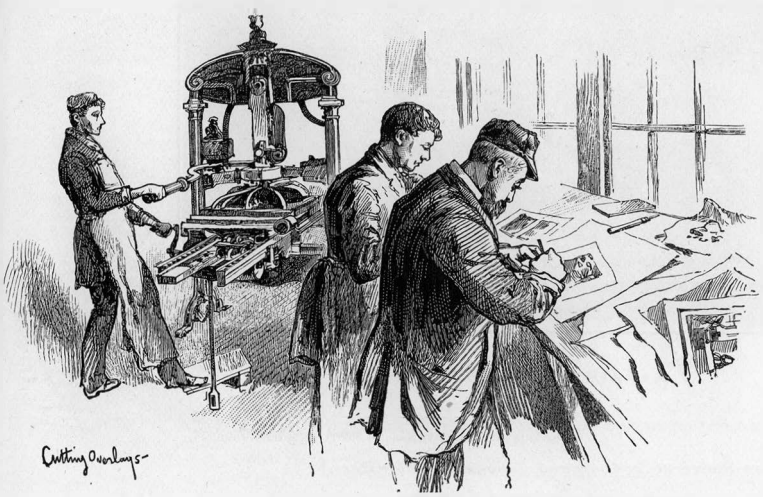
These photographic processes are continually improving, and it is perhaps not too much to say that in course of time they may possibly revolutionise the whole art of both illustrated and colour printing.

When the *Black and White* Publishing Co., Limited, was organised, the managing director visited France and Germany—accompanied by Mr. Brækstad, the art editor—to acquaint himself with the improved machines there in use for turning out the highest class illustrated work. The result of this journey was the decision to import the machinery from a German firm, and the experience of these machines has been thoroughly satisfactory. Why English firms do not produce printing machinery equal to that of German and French manufacturers we cannot explain; but in all our experience we have never seen better or more reliable presses than those in the *Black and White* Publishing Co.'s works. This is certainly a state of things which ought not to be, and the English firms should bestir themselves to meet the foreign manufacturers.



A CORNER OF THE COMPOSING DEPARTMENT.

Another factor in printing is the damping through which the paper is put previous to its being printed. The paper is received from the mill in reams of 516 sheets. These reams are opened out and placed, quire by quire, under a shower tank, and evenly wetted; they remain thus in stacks for twelve hours or so, and, after many twists and turns, each sheet is passed through a rolling machine, which consists of four hard polished-steel rollers and two papier-maché rollers. This gives the paper a beautiful, fine, smooth surface, just moist, and the paper is now properly prepared for printing. Although this damping process is as ancient as Caxton himself, many experts maintain that it is better for high-class printing than the dry super-calendered paper so much in modern use. Papermakers may not agree with us perhaps, as the damping process brings out any imperfections in the paper, and so demands honest materials in the manufacture.



CUTTING OVERLAYS.

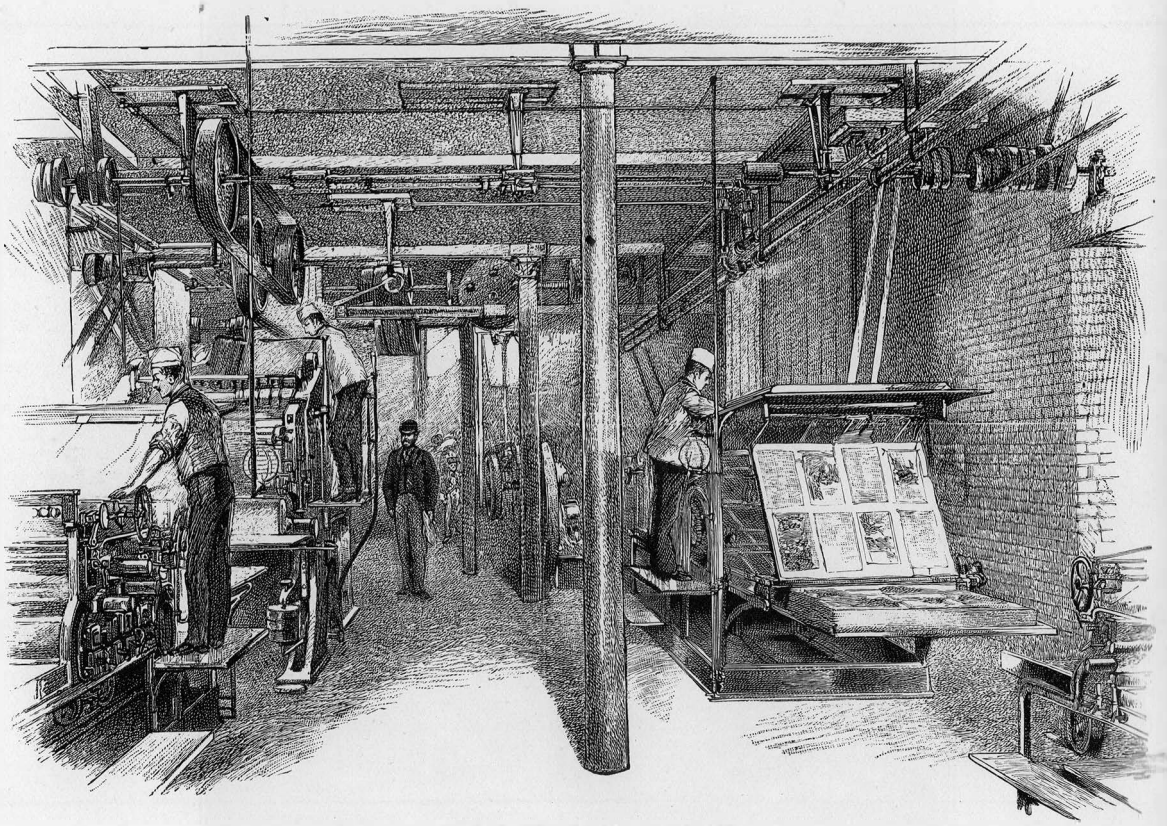
The electrotypes of type and engravings are now placed in position on the printing machine, and the operation of "making ready" is commenced. This making ready is perhaps the most delicate work in the whole art, and it is here that the thought and artistic knowledge of the printer is most requisite. The plates are placed in their proper positions on the machine, and an impression is taken for underlaying; that is, where parts of the electroplates appear low, pieces of paper are cut and placed underneath the electro, thus raising the part required by the thickness of the paper; this may require several patchings before it is made quite level.

We should explain for the benefit of our non-technical readers that the quality of the finished printed sheet depends upon the depths, sharpness, and tones obtained, and that these are all the results of various degrees of pressure only possible by

the exercise of the greatest thought and experience in preparing the padding: that below the plate is called underlay, and that behind the sheet of paper to be printed, above the plate, is called overlay. Curiously enough, certain effects can be obtained by the "underlay" which are not possible by the "overlay"; but, of course, it is the "overlay" which plays the great part in satisfactory printing.

Overlaying is a delicate and difficult process, and it will be of interest for us to visit the "overlay" room. Here we find several men—artists would be a correct title—each with several proofs before him of each of the engravings about to be printed, and with a sharp knife they are cutting out of these proofs various little snips of paper here and there, and sticking other little pieces of paper on to other parts of the print. When the overlay is completed it shows us a mutilated paper copy of one of the engravings, with all the light parts cut away, and the darker parts increased by one, two, three, and sometimes more thicknesses of paper, according to the degree of density required in the printed sheet. The aim of the printer in all this is to lighten or increase the density of the pressure on the blocks when printing, and the value of the printed result will much depend upon the more or less satisfactory manner in which this has been obtained.

Returning again to the machine room, we now find all the electro plates adjusted firmly in their places, and sheets of paper, which have been carefully pasted round the cylinder, are run over the plates, and now bear an exact copy of the type and its various illustrations. Now the overlays, which have been so carefully prepared, as we have just seen, are pasted each on its counterpart on the cylinder; a clean sheet of paper is run through the machine and carefully examined. Several further alterations are now seen to be required in the overlays, and extra cutting away or additions are made until the best possible result is obtained, and all the lights and shades brought out as in the artist's original sketch. This operation, which takes ten or twelve hours of anxious work, brings its reward to the careful and patient printer in a well-balanced print, full of detail and artistic light and shade.



ONE OF THE MACHINE ROOMS.

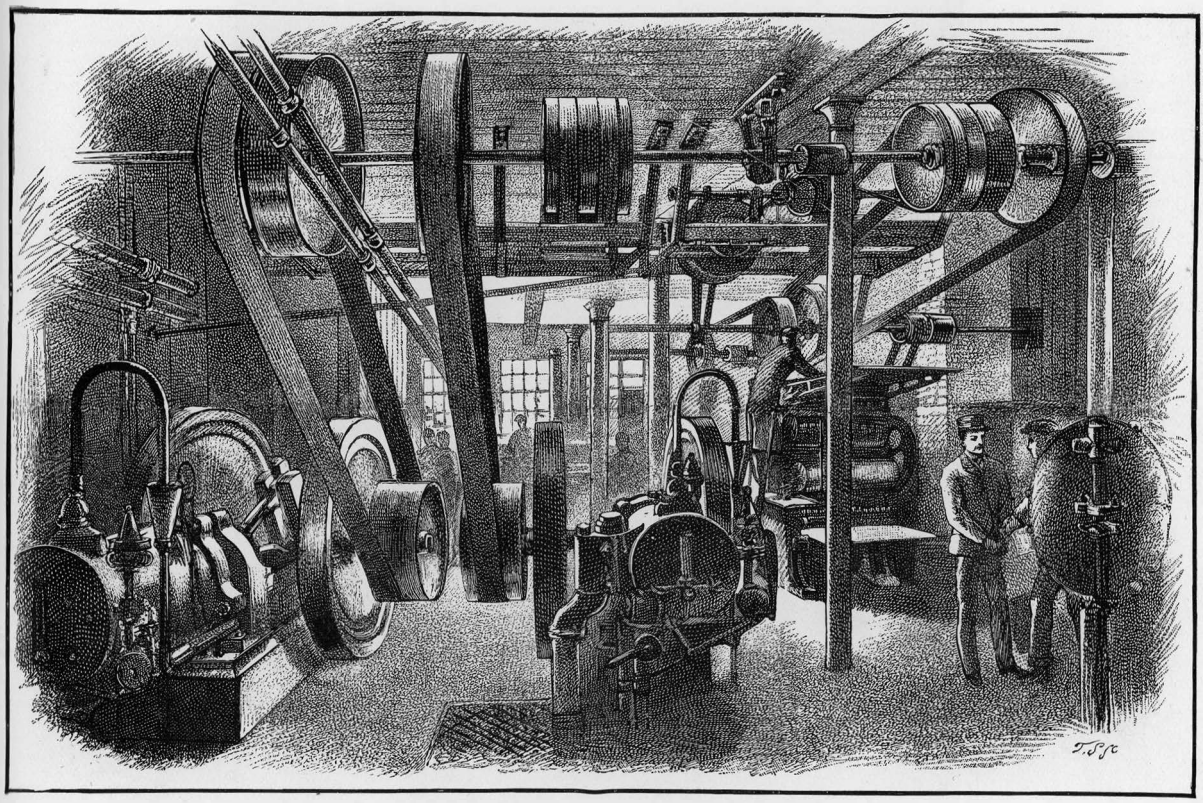
The machine is now ready to print the issue, and the machinery and inking being in trim, away rattle the machines, each one turning out sheets at the rate of 1,000 an hour; but the new machine on page 401 will turn out 2,000 an hour.

We have now arrived at the end of the printing stage, and all that remains to be done is to fold the sheets, put on and stitch the cover, and cut the edges and bundle them up ready to send out to the world.

For producing a high-class illustrated paper the best and best-paid workmen are always the cheapest in the end; we have the pleasure of knowing that Mr. Orford has as fine a staff as could be desired.

Mr. Orford has certain strong opinions regarding the position of the printing art in England, which are perhaps worth quoting :—

"I have worked all classes of English machinery, and I cannot but admit that German machines are a long way in advance of our present English manufactures. British printers are, however, I can say from some experience, as good as can be found; they



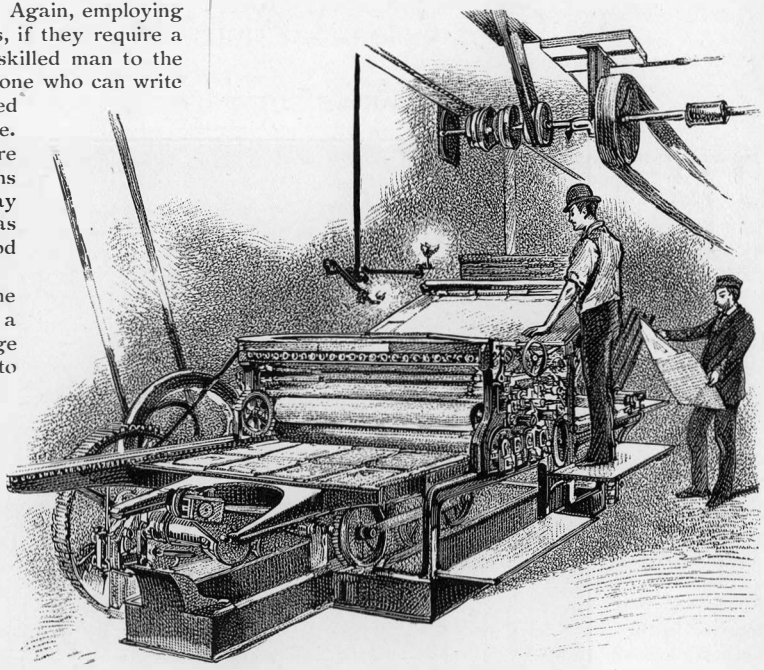
ENGINE ROOM.

are quicker than the Germans; while a German is thinking about how to start on a job, the Englishman is well on the way. I am sorry to say, however, that many hundreds of thousands of pounds worth of printing is being sent out of this country every year, and I am afraid that it will increase if some strong action be not taken in the matter, in which master and man should join hands, instead of fighting each other. This loss of business is a subject I feel very strongly upon. Last summer, and again this, I had the opportunity of visiting Germany and inspecting some of her printing offices, where some very fine work was being turned out. In Germany the printer is much more studied than in England. His finely-appointed machine room is well lighted; he is consulted when engravings are to be made, and the details are arranged in conjunction with him, which, I am sorry to say, is not yet the rule in this country. The head printer in Germany and in America is a responsible and practical man, which is not always the case here. The day has passed when printers should be looked upon as simply machine minders, for they have a far higher part to play if we expect to equal or compete with our foreign competitors. A good printer must have a taste for design, be a judge of light and shade, and understand something of engineering. Little notice is taken of the printer in our days—it is time he came more to the front. Authors and artists should try and rub shoulders with them, and then they would get better results for their labour.

"Great care is taken in the writing, the drawing, and the engraving; but when the printing has to be done the publisher, as a rule, sends round to the trade for the cheapest estimate, and the English printer has naturally to turn out his work according to the price obtained. This is not the case in Germany and France, or in America. There good work is insisted upon, and fair prices paid by publishers, with the result that the printer does justice to the author and

artist in doing justice to himself. Again, employing printers in England, in many cases, if they require a manager, do not bring the most skilled man to the front, but give the position to the one who can write the best hand, or he who has curried most favour in the counting house. Then, again, the machine rooms are too frequently the worst lighted rooms in the building, with gas burning day and night, whereas good light is as necessary to good printing as good ink and good paper.

"Also, too frequently, the machine overseer has to submit his work to a manager who is not a practical judge of illustrations; or, again, he has to take paper and ink ordered by a non-practical employer, which may be entirely unsuitable for his work, and to complain would jeopardise his situation. So he has to do the work, knowing that the result must be inferior; whereas, if he had been called into consultation when the materials were ordered, his practical judgment would enable better results to be attained, often at less cost.



PRINTING MACHINE AT WORK.

"I think the present system of apprenticeship is, in many cases, the cause of turning out printers only partly educated to their business. What I would like to see in England is a guild formed for educating lads in high-class printing and fine illustrated works. Opportunities should be given for evening classes, and exhibitions should be held yearly, and awards and certificates given for merit.

INSETTING. STITCHING. CUTTING.

This, I honestly think, would be the first step towards perfecting every young printer who wishes to thoroughly learn his business. The idea should cover every branch of the printing art: composing, engraving, electrotyping, stereotyping, pressmen and machine minders. Germany and France have their technical schools—why should not we?"

These views of Mr. Orford we cordially agree with and endorse. If we Englishmen set our minds to it we can break any foreign competition, and it is certainly time that we set our houses in order in regard to printing, which abroad has become an "art," whilst largely left a "mechanism" with us still.

THE first printing office in the United States was established in 1639; the first political newspaper was printed in 1733; the first daily paper in 1784; the first penny paper in 1833; and the first illustrated paper in 1853.

PRINTERS who do not deliver goods on time are cheating their customers and themselves. They are cheating their customers of time, and causing them worry and loss. They are cheating themselves of that reputation for reliability without which no business can prosper. This is a serious matter, and printers should not view it too lightly. Allied trades are no better, and they, too, need stirring up on this point.