Vol. 24

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THE MONOTYPE RECORDER

A JOURNAL

for
Users and Prospective Users
of
"MONOTYPE"
Machinery and Supplies

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No. 207

21252

THE
MONOTYPE RECORDER
MAY-JUNE
1925

PUBLISHED BY
THE LANSTON MONOTYPE
CORPORATION LIMITED
LONDON

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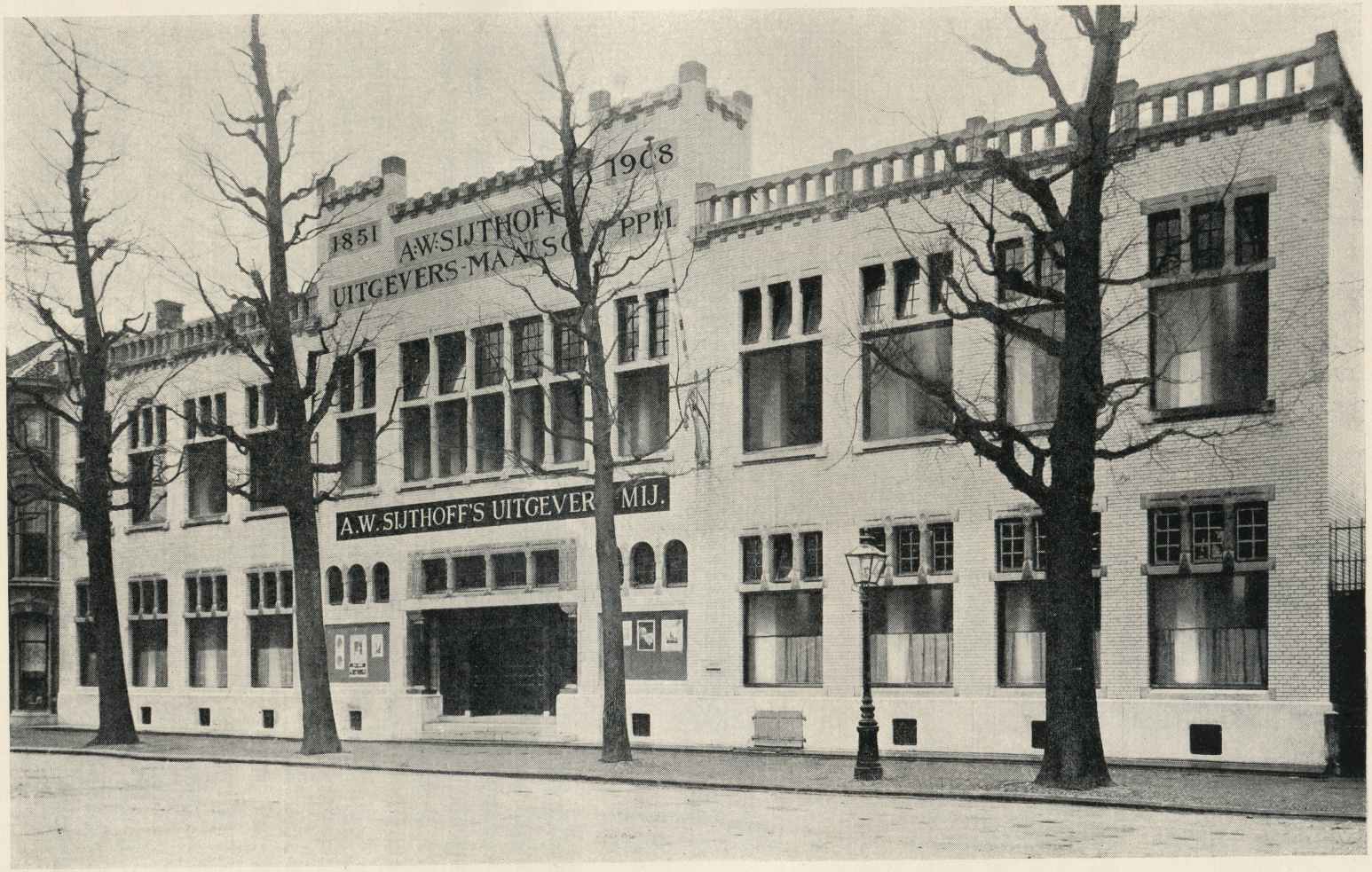
THE PRINTING EXHIBITION

The excitement of this quadrennial event is once more over, and fretful exhibitors and loquacious salesmen again breathe freely.

Fine weather favoured the period of the show, and the organisers are to be congratulated upon the result, as every square inch of space appeared to have been appropriated.

Excepting certain efforts in photo-mechanical processes, more especially as applied to offset lithography, it cannot be said that anything very revolutionary or startling was on view. One gained the impression that manufacturers had devoted more attention to improving existing machines and processes rather than to the exploitation of novel theories. The inventive spirit of the last two decades has not been inactive.

We have reason to be satisfied with the result of the two weeks' ordeal; the orders received and healthy inquiries made assure us that the popularity of the "Monotype" is still in the ascendant, and that its reputation for adaptability to every class of composition is unassailable. We demonstrated that the machine is capable of composing in any sizes



MESSRS. A. W. SIJTHOFF'S PRINTING AND PUBLISHING HOUSE IN HOLLAND

from 5 to 36 point and will undertake tabular work of the most intricate nature, in addition to which the machine can be used for plate mounting, for lead and rule casting and cutting; in short, for every operation that is likely to occur in the composing room.

Great interest was taken in the "Monotype" Typecaster, and we feel that the recent output records justify devoting some pages in this issue to this particular feature.

In addition to "Monotype" machines we demonstrated a Harris single-colour offset machine, with automatic sheet-feed and delivery, which evoked the admiration of every visitor. The "Miller" products were also popular, especially the new "High-Speed" automatic cylinder press and the famous Saw Trimmer.

On page 12 we give an illustration of our exhibit, and to those printers who did not attend we shall be most happy personally to convey information regarding developments in the "Monotype," and to show how the machine can be adapted to the needs of the composing room.

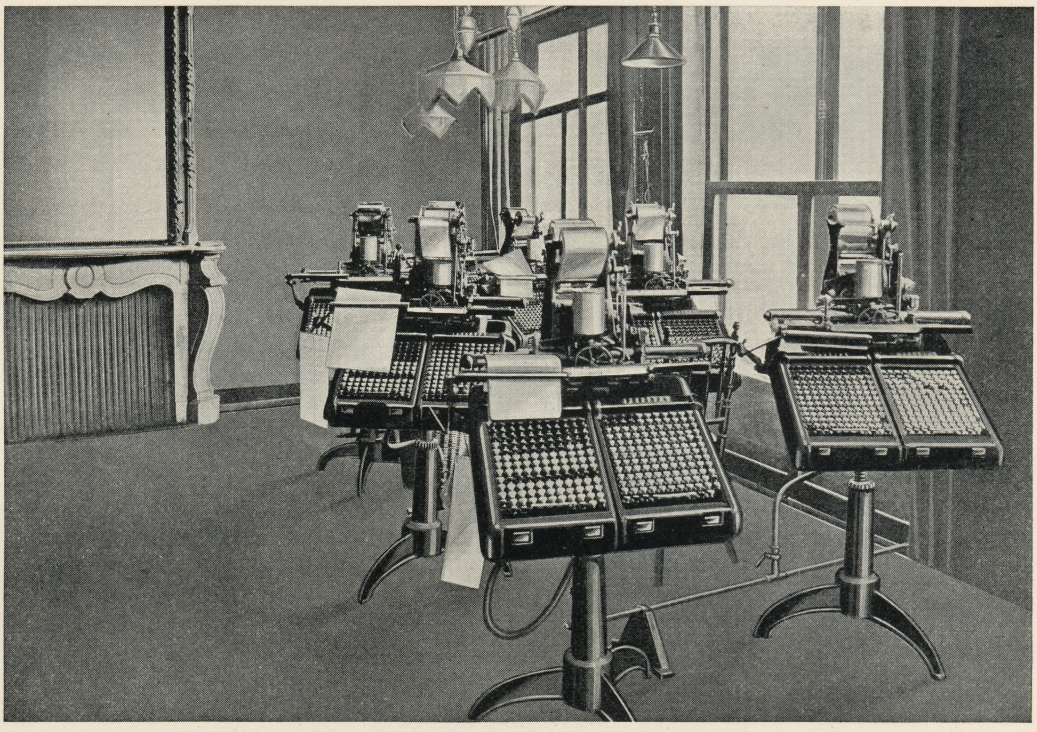
A NOTABLE PRINTING AND PUBLISHING HOUSE IN HOLLAND

Messrs. A. W. Sijthoff at Leiden, Holland, can undoubtedly be called an up-to-date printing and publishing establishment.

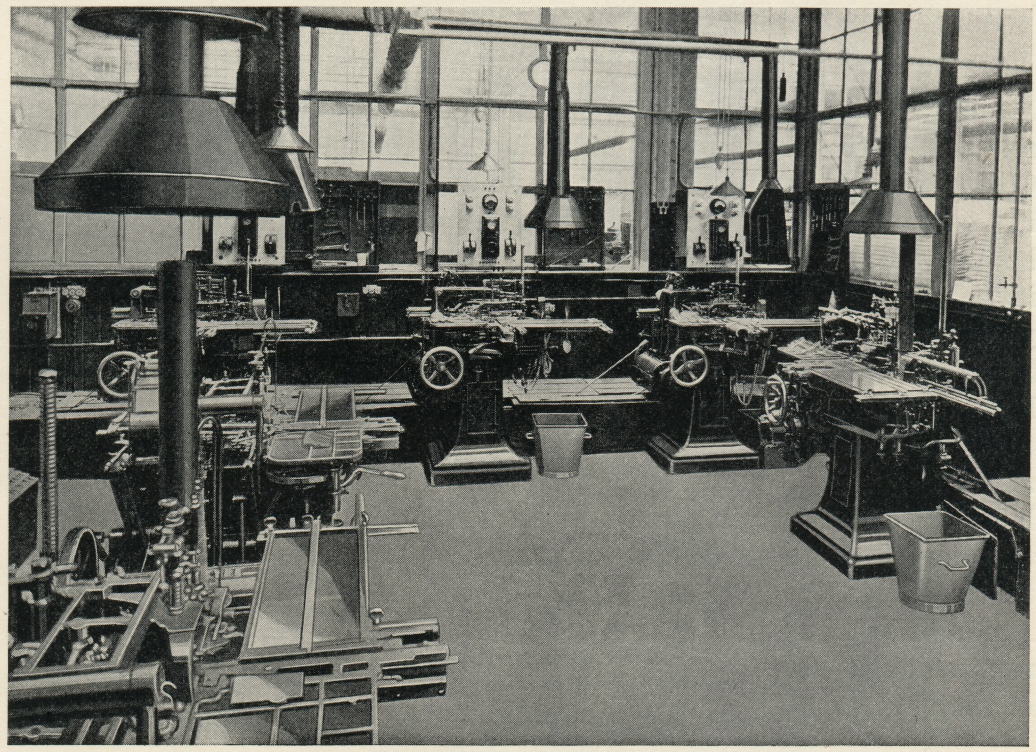
Commenced by Mr. A. W. Sijthoff on a modest scale in 1851, the firm has continued to extend steadily, and has produced many important books and periodicals. Technical improvements have been repeatedly introduced, until the whole business has acquired a reputation far beyond the frontiers of Holland.

Since the erection of the original building, and the extensions which have been added, the policy has always been observed of keeping the technical departments, such as the composing-room, the printing room, and the book-binding branches, on the ground floor, with overhead light, good ventilation and central heating. Only the rooms for storing the publishers' books, etc., were specially reserved to the upper parts of the buildings.

Among the many publications of which this firm enjoys a world-wide reputation we may mention the *Codices Graeci et Latini*, with facsimiles of the old handwritings.



"MONOTYPE" KEYBOARD MACHINES



"MONOTYPE" CASTING MACHINES

Various important periodicals have also been published by them, such as the *Gracieuse*, *Panorama*, *Rijk der Vrouw*, *Nederlandsche Bibliographic Museum*, and *Recueil des Travaux Chimiques*, the last mentioned having a high place in the study of chemistry, both in this country and abroad, since 1882.

To enumerate all the scientific works, text-books and novels which have been printed and published by Messrs. Sijthoff during the last seventy-five years would require more space than we have at our command, but we would refer readers to the extensive catalogues published by this firm.

It will be readily understood that to print and publish books, together with numerous periodicals, rapidly and well demanded some method of composition more up-to-date than was possible by hand, and which might entirely supersede the latter system. After many systems had been tried the preference was given to the "Monotype" as the machine best adapted to the requirements of the business, especially as corrections could be easily made by a hand compositor.

When the staff became familiar with the machine it proved to supply a long-felt want, with the result that the "Monotype" plant was gradually increased.

Under the direction of the present managing director, Mr. A. W. Frentzen, the business has been considerably extended. Rapid-running presses were introduced in the machine department, the stereotype plant was brought up-to-date, and the number of "Monotype" machines added to, so that at the present day the firm possesses a plant of eight "Monotype" keyboards and six casting machines, one of which is equipped with a display-type and lead and rule attachment.

This "Monotype" extension was rendered necessary on account of a demand for the more rapid and prompt issue of many new publications, including all the volumes of the *Publications de La Cour Permanente de Justice Internationale.*

The number of weekly and monthly periodicals has also increased, so that all departments are steadily growing.

The first illustration shown is a front view of the fine main buildings, while the second and third show a portion of the "Monotype" keyboard and casting machine departments. The success of this firm indicates that in Holland the merits of the "Monotype" are highly appreciated.

EEN BEDRIJF IN VOGELVLUCHT

Een modern ingericht bedrijf kunnen wij ongetwijfeld A. W. Sijthoff's Uitgeversmaatschappij te Leiden (Holland) noemen.

Hoewel op bescheiden voet in 1851 door den Heer A. W. Sijthoff aangevangen, heeft de firma zich in den loop der jaren gestadig uitgebreid; belangrijke en kostbare werken werden uitgegeven; technische verbeteringen voortdurend aangebracht, zoodat het geheele bedrijf zich ver buiten het land een zeer goed reputatie heeft verworven.

Bij den bouw en de in den loop der jaren plaats gehad hebbende uitbreidingen is steeds er naar gestreefd alle technische afdeelingen, zooals zetterij, drukkerij en binderij op den beganen grond in te richten met ruime toevoer van goed licht en een practische ventilatie en verwarming. Alleen de magazijnen der fondsartikelen bevinden zich op speciaal daarvoor ingerichte fondszolders.

Van de uitgaven welke zich in een wereldvermaardheid mogen verheugen, noemen wij de *Codices Graeci et Latini*, welke de oude handschriften zoo natuurgetrouw mogelijk in reproductie weergaven.

Verscheidene belangrijke periodieken zagen het licht, zooals *Gracieuse*, *Panorama*, *Rijk der Vrouw*, *Ned. Bibliographie Museum* en *Recueil des Travaux Chimiques*, dat van 1882 af een eerste plaats bij de studie der Chemie in binnen- en buitenland heeft ingenomen.

Een opsomming te geven van de talrijke romans, wetenschappelijke en studiehoeken, welke in deze vijf en zeventig jaren uitgegeven en door het technisch bedrijf verzorgd werden, zou te ver voeren. Wij verwijzen daarvoor naar den omvangrijken Fondscatalogus, welke de firma gaarne op aanvrage aan belangstellenden zendt. Het is te begrijpen, dat om deze vele werken, vermeerderd met talrijke periodieken, goed en op tijd gereed te maken, al spoedig naar een *snellere zetwijze werd omgezien*, welke het handzetsel geheel kon vervangen. Na vele vergelijkingen gaf men de voorkeur aan de "Monotype", daar deze zich het best bij het bedrijf aanpaste en ook gelegenheid gaf de correctie op gemakkelijke wijze in het zetsel aan te brengen.

Toen men eenmaal met de machine vertrouwd was, bleek deze in een bestaande behoefte te voorzien en werd tot geleidelijke uitbreiding overgegaan. Onder leiding van den tegenwoordigen Directeur, den Heer A. W. Frentzen, nam het bedrijf steeds grooter vlucht. Snelloopende machines werden voor de drukkerij aangeschaft, de stereotype naar den eisch des tijds ingericht en het aantal "Monotypes" nam steeds toe, zoodat de firma momenteel over een installatie van acht keyboards en zes gietmachines beschikt, waarvan op één, het groot letter-apparaat

met lijnengietinrichting is opgesteld. Deze uitbreiding was o.a. noodzakelijk om de vele nieuwe uitgaven, waarbij alle deelen der *Publications de La Cour Permanente de Justice Internationale* behooren, snel en op tijd af te leveren. Ook de periodieken namen in aantal toe, zoodat het technisch bedrijf steeds groote in omvang werd.

De eerste illustratie vertoont den gevel van het kloeke hoofdgebouw, terwijl de tweede en derde een kijkje gunnen in een gedeelte van de afdeelingen keyboards en gietmachines.

Voor de lezers van de MONOTYPE RECORDER een bewijs, dat ook in het kleine Holland de "Monotype" naar verdienste gewaardeerd wordt.

SPECIMENS

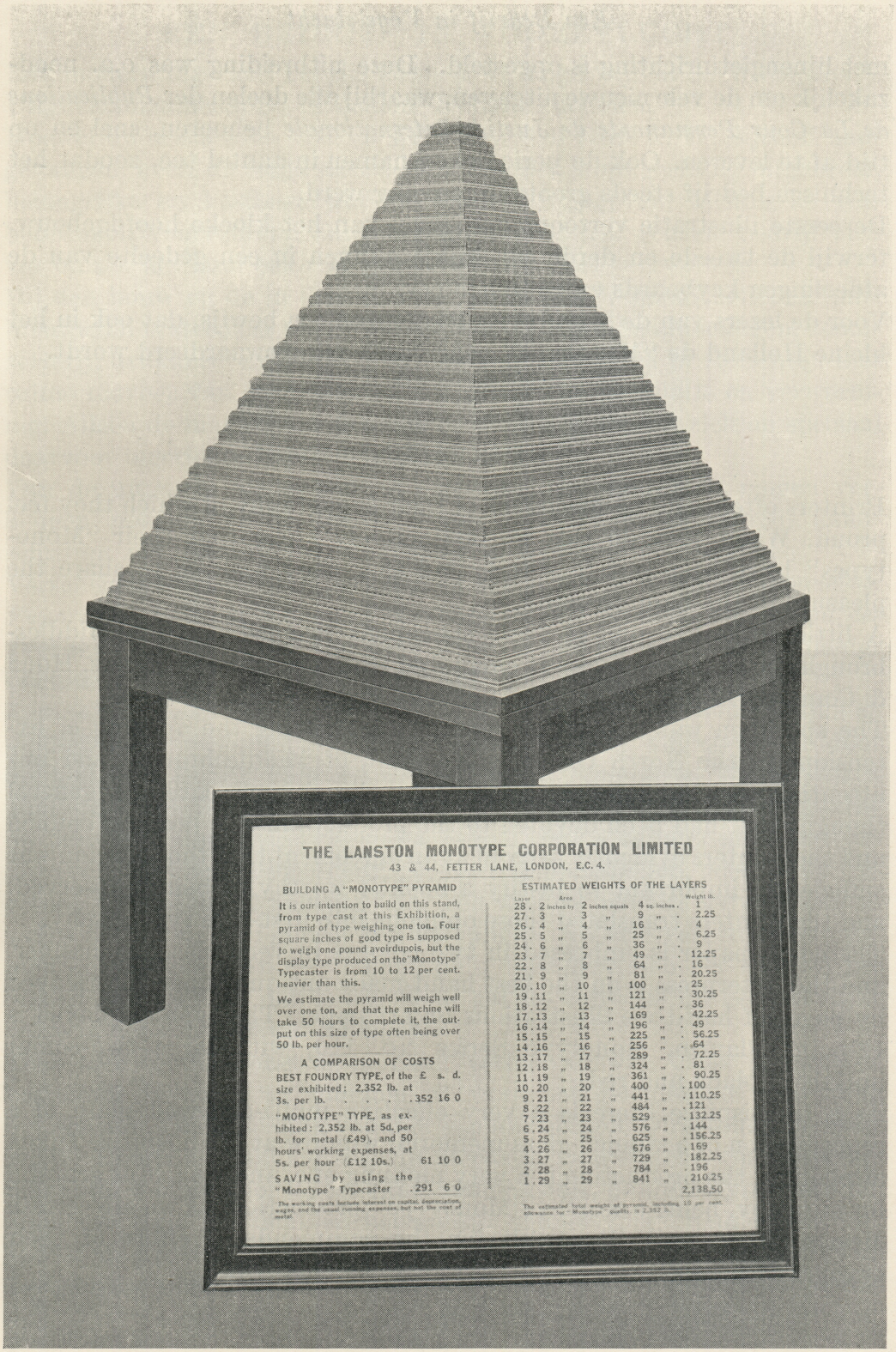
Printers often send us specimens of their typography of which they feel proud. When they do this we instinctively know that their "Monotypes" have been put to a test, and that they wish us to share the pleasure of the happy results.

A little while ago one of these specimens reached us from Middlesbrough; to be more precise it emanated from the press of Messrs. Hood & Company, Limited, of the Sanbridge Press of that town.

The specimen was a souvenir booklet announcing the opening of extensions to the North Ormesby Hospital, of Middlesbrough, and our attention was immediately arrested by the obvious care and general thought that had been devoted to the production. The hospital council and the printers evidently arrived at an agreement that the occasion was sufficiently important to justify a booklet worthy of being preserved, and the printers translated these opinions into first-rate typography.

The cover paper is embossed in two colours in very pleasing manner, and the letterpress is on the best hand-made antique paper, interleaved by pages of half-tone illustrations on art paper. The type employed is 12-point Plantin, Monotype Series No. 110, with large two-colour initials in black and red.

As a frontispiece there is a very effective multi-coloured plate of a reproduction of a stained glass memorial window at the hospital. Taken altogether, the production is a very pleasing one, and we felt as grateful for our copy, being a worthy "Monotype" production, as we are certain Messrs. Hood must have felt for the commendable effort of their typographer.



"MONOTYPE" PYRAMID

OUR TYPECASTER

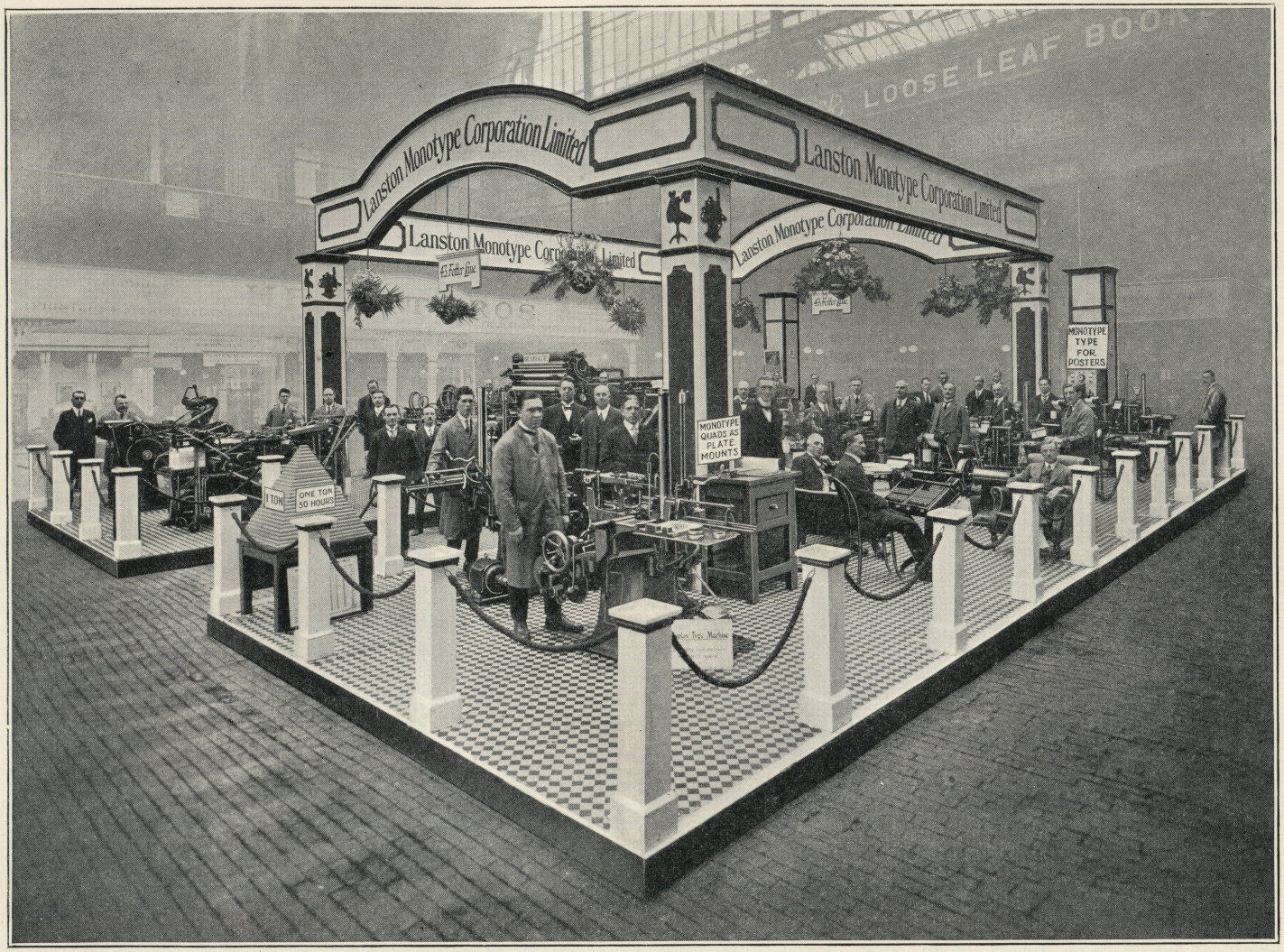
With the January-February MONOTYPE RECORDER we enclosed four proof sheets of a fount of 112 pounds of 24-point type, which was cast on the "Monotype" Typecaster in three hours. Making a liberal allowance of 5s. per hour for running costs, and charging 5d. per pound for metal, this output showed a saving in expenditure over the purchase of a similar weight of foundry type (at 3s. per pound) of £13 14s. 4d.

Our statement regarding the output has been the subject of considerable comment amongst printers, to whom the possibilities of this machine have come as a revelation. The output was challenged by a gentleman holding a responsible position in the printing trade, who requested us to reproduce the fount in his presence. After reproducing it in ten minutes less time than we claimed in our statement, the gentleman referred to generously made amends for his scepticism by sending us the following letter:—

"May I be allowed to thank your technical representatives for their courtesy on Saturday last, when, in company with my two head Monotype caster attendants, I paid a visit to your works to see the challenged test on the Job Caster machine. I must apologise for my doubtful attitude regarding the three-hour production of 24-point which you circularised in galley form with the January-February MONOTYPE RECORDER. Your people certainly did the test in my presence with about ten minutes to spare, under what might be termed fair conditions, and I am much obliged for the information gleaned as to the capacity of the machine. I should like to say that the quality of the type was excellent in every way, and we are now working to produce type on our machine at the same rate as yourselves, and will let you know the result later."
—(Signed) E. G. Bausor. May 11, 1925.

Mr. Bausor is evidently a very practical manager, for he immediately decided to try to equal or beat the record of our own effort. How far he succeeded may be gathered from the following letter:—

"We are sending you herewith six sets of galley slips to show you the result of the test run on our Job Caster for which you loaned us the matrices. The time taken on the actual running was 3 hours 35 minutes. Compared with your 'challenge' test (if we may call it that) this would appear that we took about 45 minutes longer than you did, but when the output is analysed you will find that although the weight is about the same, viz., 112 pounds, the number of letters cast by us is something like 2,500 more than your casting. This is accounted for, of course, by the fact that the type which we cast (24-point Cheltenham) is very



THE "MONOTYPE" STAND AT THE PRINTERS' EXHIBITION

much thinner set-wise than the face you circularised. However, we think you will agree that we have succeeded in our endeavour to put our output on a better basis."—(Signed) E. G. Bausor. May 14, 1925.

Further to convince sceptical printers regarding the high output possible from the "Monotype" Typecaster we imposed upon ourselves a special task at the recent Printing and Stationery Exhibition. We undertook, in spite of all the inconveniences associated with Exhibition work, to cast from one machine within 50 hours a pyramid of type, the weight of which was over one ton avoirdupois, and we posted in advance a printed notice of our intention so that those interested might watch the progress of our effort. The task was finished one minute under the time we anticipated it would take, and we reproduce a photograph of the result so that printers who did not attend the Exhibition may interest themselves in our accomplishment.

The "Monotype" Typecaster is making most remarkable headway, and most flattering unsolicited testimonials are constantly reaching us indicating the esteem in which this machine is held by users. This spontaneous appreciation is not confined to the home market, and we have pleasure in reproducing the kind words of Mr. J. W. Baty, a New Zealand enthusiast, who writes:—

"We have had in use for the past twelve months one, and we believe *the only, fully equipped* jobbing and lead and rule caster in New Zealand. There is no doubt as to the value of the machine.

"We have on many occasions demonstrated to prominent printers the versatility of the machine, and the fact that we have so many practical illustrations to verify our statements regarding the output of the machine strengthens the opinions of those who have seen it. The dispensation of that unprofitable 'dis' is the strongest argument. We keep a quarter of a ton of 'sorts' in our reserves, including leads and rules and borders, which means that the replenishment of type for almost any number of compositors is the work of a junior apprentice for a few hours a week. The casting of sorts is quite a small matter, and is done between jobs. We feel sure it will not be long before quite a number of machines will be in use in the Dominion. Our operator cast 63 lb. of leads per hour cut to sizes from 8 ems to 42 ems in length.

"We wish you further successes, and will at all times be pleased to attach ourselves to your 'selling staff' out here by demonstrating the practical results of the 'Monotype'."—(Signed) J. W. Baty, Managing Director.

JUSTIFYING
"MONOTYPE" TYPEWRITER COMPOSITION

I have been privileged to handle a rather unusual and interesting piece of work. The job consisted of many foolscap folio pages, set in typewriter face (Series 105—7¼ set—12 point), 36 ems measure, with insertions from 18 ems to 23 ems wide. The instructions were that the lines should be justified to make them even in length.

The general opinion was given that it was an impossible job for "Monotype" composition. However, I have pleasure in submitting a slip showing part of the finished product. From this it will be noted that the spacing varies considerably, some lines being widely spaced while in others the spaces are very narrow.

The justification of the composition was overcome in a very simple manner by the use of the *letter-spacing* method; in widely-spaced lines by using the letter-space key with the space, and in tightly-spaced lines by using the same key in conjunction with the first letter in each word. In letter-spacing typewriter founts, however, the ordinary method of justification must be supplemented—the actual justification position being just *double* the amount shown on the em scale, and an addition must be made to the indicated justification figures to compensate for the reduction of two units per space caused by letter-spacing. In typewriter composition—7¼ set—the measure is made up to ens, each en representing one letter of composition, but as these letters count ten to one inch they represent ems of 7¼ set.

Example:

Em scale records 2½ ems (10 spaces). Justifying scale indicates 5–6.

Actual amount required to complete line=5 ems.	
Justifying scale indicates	8–11
Plus amount required to rectify for letter-spacing (the difference between 3–8 and 2–1)	1– 7
	10– 3

Typewriter normal "wedge" must be used, and quad sized to .1003″, the 18-unit space.

A simpler method of arriving at the line-justification of typewriter faces by "letter-spacing" the spaces is to double the indicated figures and to subtract 0–9. This applies to the 12-point typewriter faces which are cast to 7¼ set. In the case of 10-point typewriter faces the justification

would be double that shown on the justifying scale, minus 1–2. The example of justification given above (7¼ set) therefore becomes:

Em scale records 2½ ems (10 spaces). Justifying scale indicates	5– 6
5–6 doubled . . . . . =	10–12
Minus 9 to give actual justification . . . =	10– 3

When typewriter lines contain justifying spaces the measure may, if needed, contain odd units. This is not done when the lines end uneven; each line then contains a definite number of types and spaces. If the measure is to contain odd units and the printed lines are to end uneven, with even word spaces, the justification may be made by "letter-spacing" the spaces at the *end* of the line. The area of the matrix seating limits the actual justification reading to 12–15.—T.G.

Example of justified typewriter lines:

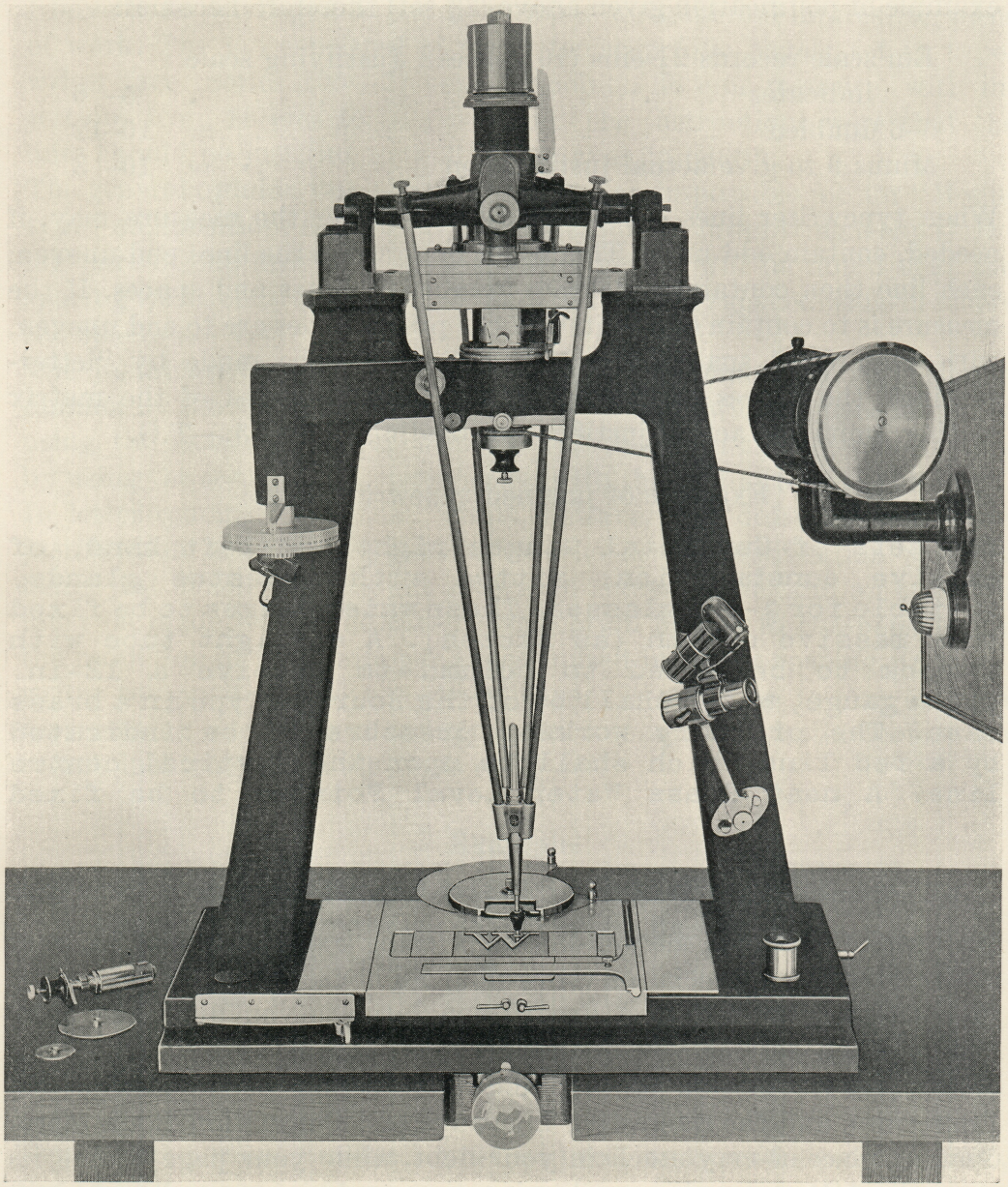
Two sets of Gun Metal Gauges right and left hand, of massive construction, fitted with asbestos glands, suitable for ¾-in. glasses. These water gauges to be fixed to a massive column (as sketch). A straight tube with a cock to be fixed to column to receive a 12-in. steam gauge, which shall be of the Bourdon Type in a brass case. The ordinary working pressure to be indicated by a red line which shall be upon the vertical centre line. A neat Brass Water Level Pointer to be fixed

WHAT PEOPLE SAY

Mr. Frank Colebrook, the well-known printing trade journalist, has sent us the following appreciation concerning our house organ. He writes:

"I must treat myself to a line to congratulate you upon the quite distinguished service you are rendering to all of us by way of the MONOTYPE RECORDER. Its facsimile reproductions of the glorious old Psalterium, and the interesting Ligatures and Coronation Book reproduction, place us very much in your debt, while your page 6 with its example of 'Monotype' versatility is a very good hint to us all as to how to advertise our business in a way that shall serve its intended purpose, and also serve those to whom it is addressed.

"I have often felt grateful to you for your publications, and this time I must just take a moment of your time to let you know this."



PIERPONT PUNCH-CUTTING MACHINE

PUNCH-CUTTING MACHINES

In British politics within recent years much argument has raged around what are known as "key" industries. These are industries upon which depend the success, and in many cases the actual existence, of greater industries. Punch-cutting is the "key" of the type-composing machinery business, without which neither "Monotypes" nor any other form of type-composing machine which makes a casting from matrices would be commercially possible. Punch-cutting is the forming of the punches required for stamping, usually in copper or gun-metal, the matrices from which the types are cast.

Before the advent of punch-cutting machines the punches used in type making were produced entirely by hand. The work was slow and tedious, and only a few expert punch-cutters were to be found.

When type-composing machines were first invented the question of the equipment of matrices at once became obvious, and it was quickly ascertained that if these machines were to become commercially successful some mechanical method of manufacturing the punches would have to be devised. Matrices could or had to be manufactured in great quantities at a high rate of production, and provision made to replace broken or worn punches with exact duplicates. It was imperative that there should be no difference in the appearance of the same letter cast from matrices impressed by different punches. These demands and necessities resulted in the evolution of the modern punch-cutting machine.

Punch-cutting by mechanical means may be said to have had its genesis a century ago. In 1827 a New York printer named Wells started the manufacture of wood type, which were cut mechanically in a machine with a flat-faced cutter revolving at high speed. The superfluous material from the end of the wood type was cut away on the same principle as that embodied in the modern routing machine, which is used for removing the unwanted surface of line blocks or stereotype plates.

In the early seventies Mr. Linn Boyd Benton, of Milwaukee, conceived the idea of mechanically cutting types which would serve as models (and from which electro-deposited matrices could be produced) to be used in connection with existing type-casting machines. Benton, like many other inventors who have revolutionised industries, was not an engineer, and his connection with the printing industry developed more or less by chance. Born on May 13th, 1844, he received his early education at the hands of a parson, who permitted him to play in the afternoons if his lessons were satisfactory in the mornings! Young Benton used to spend his afternoons in the company of a local tombstone

carver, and thus he learned the elements of letter-design. From tombstone work he passed on to repairing watches, and at this work must have learned to appreciate the value of accuracy in mechanical movements. His father was a lawyer who became interested in various newspapers, and it was as a result of this newspaper interest that the son acquired a knowledge of printing. He evidently did not like printing, and took up a book-keeper's post at a type-foundry in Milwaukee owned by an associate of his father. The proprietor of the typefoundry became bankrupt, and young Benton and a partner purchased the business. After several changes in the business a grocer named Waldo became his partner, and the business later on became a flourishing concern for the manufacture of "self-spacing" type, a term applied to type cut upon definite unit widths, similar to "Monotype" type of to-day.

Briefly described, a punch-cutting machine carries a pantograph, the lower end of which follows the outline of an enlarged pattern of the character which is to be reproduced much smaller in relief. The upper end of the pantograph carries the steel to be engraved, which is worked around a small cutting tool revolving at very high speed. The lower end of the pantograph is fitted with a roller, called the follower; this is traced around the edges of the large pattern of the character. This follower is then replaced by another of a smaller diameter, and so on until the engraved type on the steel punch body is correctly formed. The process is one of gradually cutting away the end of the steel punch body until the character is complete.

Mr. Benton worked upon this machine for twenty years, and eventually produced the first successful type-cutter. These machines must be most accurately made, and so fine is their construction that even a variation of the temperature of the room in which they are positioned may affect the nicety of their adjustments. The cutter revolves at about 10,000 revolutions per minute, and is ground under a microscope.

When the Mergenthaler Linotype Company started their business in New York they found that the process of producing their matrices, in the large quantities required, by electro-deposition was slow, cumbersome and expensive, and they conceived the idea of driving their matrices from steel punches. Mr. Benton was very doubtful as to the practicability of producing them on his machine, as it was designed to operate upon soft metal only; the Linotype Company, however, experimented with it, and certain minor modifications were made which solved the problem successfully. Little did Mr. Benton dream that his

invention was to make type-composing machines commercially practicable, but such was really the case, as the great demand for composing machine matrices made it necessary faithfully to reproduce the punches in quantities commensurate with the rate at which they were liable to become damaged or worn out.

Although a number of punch-cutting machines followed the introduction of the Benton machine none proved as satisfactory as his until the machine invented by Mr. F. H. Pierpont and manufactured by the Lanston Monotype Corporation was brought out in 1907. A little later Mr. L. A. Legros introduced a modification of the Benton machine, which added very considerably to its ease of operation, and at the same time increased the output; but in both this and the Benton machine, as well as in all other modifications of the Benton machine, there is a fundamental geometrical error, by which a punch cut from a square pattern will have two of its opposite sides concave, and the other two convex. This is not noticeable in punches for small sized letters, but it becomes apparent in those of larger sizes.

The Benton machine is capable of producing satisfactory punches when operated by experienced men, upon whose skill as much depends as upon the machine, and, naturally such men demand very high wages. As the output from the Benton machine is comparatively small, the Corporation found itself in much the same position as that occupied by the Mergenthaler Linotype Company in its early days, and it became necessary to look for a punch-cutting machine which could be accurately operated by unskilled attendants and, at the same time, give an output commensurate with the capital outlay. The machine adopted by the Corporation in 1907 is capable of producing with absolute precision eight times as many punches as the Benton. The machine is too complicated to describe in detail in the space available. There are, however, three features which should be mentioned: The pattern is automatically positioned in the machine so as to ensure the character being correctly located on the end of the punch blank; at one movement of a short lever a number of complicated and accurate movements are performed with a precision that would be impossible in a hand-operated machine; the machine is equipped with a microscope containing a vertical illuminator through which the final cutting tool is examined after the punch has been completed, for if its point is intact the punch must have been cut automatically correct. In some of the final cuts in the transit of the punch around the cutting tool only .00004″ of metal is removed.

Discussions and Corrections:

This article contains an excellent illustration of the pantograph engraving machine for punch production developed by Frank Hinman Pierpont for The Monotype Corporation (UK). Unfortunately, the text is marred by serious errors regarding the history of typographical engraving machines. Many of these seem to stem from a frequently cited, but wildly inaccurate, article by Henry Lewis Bullen in 1922 {Bullen 1922}. Here are discussions and corrections of some of the errors in this present article:

1. (p. 17, ¶4) While it is true that pantograph routing machines were used in the direct cutting of wood type from a relatively early point in the 19th century, the method of pantographic routing for wood type cutting is in no way the "genesis" of punch, patrix, or matrix cutting. It is merely another example of the common application of the pantograph in many industries throughout the 19th century. As this article notes, Darius Wells employed a "router" in 1827. (The article does not make it clear that Wells 1827 router was not pantographically controlled. The pantograph was not applied to this machine until 1834, by George Leavenworth. See {Kelly 1969}, p. 33). There is no evidence to suggest any *direct* link between these well-established methods and the introduction of pantograph engraving machinery in the 1880s.

2. (p. 17, ¶3) If one takes "type-composing machines" to mean composing typecasters and composing linecasters, then these machines did require for their commercial success the mass-production of matrices. (Actual typesetting machines which set previously cast type do not, but it is probably safe to say that these are not the machines intended here.) However, and quite remarkably, these composing linecasters (primarily the Linotype and its copies/derivatives) and composing typecasters (primarily the Monotype) were *not* developed as a consequence of machine methods in punch or matrix production. Development of both the Linotype and the Monotype began before their developers were aware of pantographic punch or matrix making technologies. We have Ottmar Mergenthaler's own evidence that he was aware of the problem of matrix production {Schlesinger 1989} (and can assume that Tolbert Lanston was aware as well), but development of these machines began with the assumption that this problem would be solved - not as a result of its having been solved. The Linotype was already in commercial production (1886) before any of its developers were aware of any punch-cutting machine (ca. 1887). Tolbert Lanston's first patent for a composing machine was filed in 1885, but the Lanston company did not acquire a punch engraving machine until 1890 ({Cost 2011}, p. 69).

The mistaken idea that these composing machines came about because of the pantograph engraving machine - a mistake which is still commonly repeated - stems from accounts such as Bullen's 1922 article on Benton {Bullen 1922}.

3. (p. 17, ¶5) There is no indication anywhere in the historical record of any involvement by Linn Boyd Benton with mechanical cutting of patrices, punches, or matrices "in the early [eighteen-]seventies." His first involvement probably dates to 1883. The first actual documentation of any of his work in this area dates to 1884 {IP 1884}.

4. (p. 17, ¶5) While it is tautologically the case that punches were cut by hand before the advent of punch-cutting machines, it is not true that punches were the only method of producing type in the 19th century. The method of (hand) engraving patrices in soft typemetal was introduced in the 1840s and became an important method of type production (especially for display types). Neither is it true that "only a few expert punch-cutters were to be found." Punch-cutting and patrix engraving were well-established trades. This misinformation may be traced to {Bullen 1922}.

5. (p. 17, ¶5) There is no indication anywhere in the historical record of any involvement by Linn Boyd Benton with mechanical cutting of patrices, punches, or matrices "in the early [eighteen-]seventies." His first involvement probably dates to 1883. The first actual documentation of any of his work in this area dates to 1884.

5. (p. 17, ¶5) While Benton may have been the first to conceive of the *mechanical* cutting of patrices for electroforming matrices, the method of cutting patrices by hand dates to the 1840s and was a widespread technology in typefounding by the 1880s.

6. (p. 17, ¶5) We do not know for certain any technical details at all of any Benton engraving machine prior to 1884, and know only a single fact concerning his machines prior to his 1885 patent. The only thing we know of his pantographs before the 1885 patent is that by July 1884 he could cut punches in steel by machine. It is *likely* that Benton first applied his pantograph engraving machine to cutting patrices in typemetal, as both this article and Bullen suggest {Bullen 1922}, but we do not actually have any evidence of this. It is likely for two reasons:

- First, it simply makes sense. Patrix cutting for electroforming was a common, efficient way of making matrices. Mechanizing this process would have been an obvious first step.
- Second, in the 1940s, William Charles Gregan, a master engraver at American Type Founders, spoke with Morris Fuller Benton (Linn Boyd Benton's son) about the elder Benton's early methods. Gregan "deduced" that Benton had first used his pantograph engraver for patrix engraving. Even though no actual evidence survives, given his professional training, Gregan's deductions carry great weight.

  See {Cost 2012}, p. 60.

7. (p. 18, ¶3) It is not true that Benton produced "the first successful type-cutter." The first types to be made from matrices created by machine were made in 1882 by William Schraubstadter (at the pantograph engraving machine) and Gustave Schroder (making the working patterns) at the Central Type Foundry in St. Louis. The matrices for these were cut directly by pantograph engraver (using a machine made earlier in German and imported in 1880 by the Cincinnati Type Foundry). {Werner 1927} {Werner 1931} While Benton was presumably cutting patrices in typemetal in 1883/1884, and certainly cutting punches in steel in 1884, he did not cut matrices directly until 1899.

8. (p. 18, ¶3) It is misleading to say that Benton "worked upon this machine for twenty years and eventually produced..." This mis-dates his machines and diminishes our appreciation of his great achievements. There is no indication that he was at work on any engraving machine before 1883, but by 1884 one was in commercial use. So he produced his first pantographic engraving machine within two years, not twenty. During the next 15 years, he produced at least five distinct pantograph machines for type-making (only two of which were vertical-format). Benton continued to work on the application of these machines until his death in 1932, 49 years after he began.

9. (p. 18, ¶4) The story of an involvement by the Mergenthaler Linotype Company in the adaptation of Benton's patrix-engraving pantograph to punch-engraving in steel is entirely false. Benton, Waldo and Co. announced machine engraving of punches in steel in July 1884 (in *The Inland Printer* {IP 1884}, p. 21). This was two years before the commercial introduction of the "Blower" Linotype. This first commercial form of Linotype was put into production in 1886, initially with electroformed matrices and later with matrices made from hand-cut punches (see {Schlesinger 1989} but also Mergenthaler's patents). The Linotype syndicate did not become aware of Benton's machine until late 1887. This demonstrably false story was first told by Bullen, but unfortunately has been repeated widely since then, sometimes by otherwise reliable authorities. {Bullen 1922}

10. (p. 19, ¶2) The assertion that no other pantograph was as "satisfactory" as Benton's until Pierpont's in 1907 must be seen both as an excess of corporate pride and as ignorance of other machines. "Satisfactory" is a subjective term, but a tremendous amount of work of the first quality was done on non-Benton pantographic engraving machines prior to (and subsequent to) the introduction of Pierpont's machine. To cite a few notable examples:

- Pantographic type-making machines were employed by Werner and Schroeder in their commercial matrix engraving services after they left the Central Type Foundry in the late 1880s (they cut DeVinne, for example). {Werner 1927} {Werner 1931}
- A pantographic engraving machine was developed by Robert Wiebking and Henry H. Hardinge and used by them for their well-known commercial matrix engraving service in the 1890s and later (engraving many of Goudy's early types, for example). {CR Wiebking} Wiebking was very secretive about his machines, but his services were well-known.
- The machines designed by Barr in England for Linotype & Machinery around 1900 appeared to serve Linotype well.

Notes and References:

{Bullen 1922} "Linn Boyd Benton: The Man and His Work."
The Inland Printer. Vol. 70, No. 1 (October, 1922): frontis, pp. 60-64.

{Cost 2011} Cost, Patricia A. *The Bentons*.
(Rochester, NY: RIT Cary Graphic Arts Press, 2011)

The information from Gregan was communicated first to Theo Rehak
and then to Patricia Cost, who finally published it.

{CR Wiebking} For an extensive discussion of the Wiebking/Hardinge engraving machines, see the CircuitousRoot Notebook at:

http://www.CircuitousRoot.com/artifice/letters/press/pantocut/wiebking/index.html

{IP 1884] The Inland Printer. Vol. 1, No. 10 (July 1884).

The trade note where Benton, Waldo and Co. offer the cutting of punches in steel by machine appears on p. 21.

{Kelly 1969} Kelly, Rob Roy. *American Wood Type: 1828-1900.* (NY: Van Nostrand Reinhold, 1969).

{Schlesinger 1989} Mergenthaler, Ottmar. Carl Schlesinger, ed. *The Biography of Ottmar Mergenthaler, Inventor of the Linotype.* (New Castle, DE: Oak Knoll Books, 1989)

This is Mergenthaler's autobiography, written in the third person. Schlesinger deduced that the matrices used in the first six months of production of the "Blower" Linotype in 1886 were made using electroforming. We can also see this by an examination of Mergenthaler's patents (e.g., US 347,629 1996-08-07, sheet 10), which at this time clearly show electroformed matrices. (Old patent copies were harder to obtain in 1989, and presumably unavailable to Schlesinger.) We know from Mergenthaler's own account in this book that the "Blower" Linotype later employed matrices punched from hand-cut punches.

{Werner 1927} Werner, Nicholas J. "St. Louis' Place on the Type-Founders' Map." *The Inland Printer.* Vol. 79, No. 5 (August 1927): 764-766.

{Werner 1931} Werner, Nicholas J. "An Address by N. J. Werner of St. Louis." (St. Louis, MO: St. Louis Club of Printing House Craftsmen, 1931) Reprinted as "St. Louis in Type-Founding History" in *Share Your Knowledge Review*, Vol. 22, No. 3 (January 1941): 21-26.

Both of the Werner articles are reprinted at:
http://www.CircuitousRoot.com/artifice/letters/press/typemaking/history/punch-patrix-matrix-makers/werner/index.html

By Dr. David M. MacMillan for CircuitousRoot. 2014-02-16.

These comments are meant to accompany an article which is now in the public domain. I therefore dedicate them to the public domain as well.

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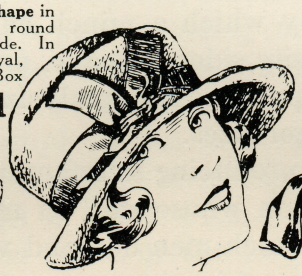
M64. Becoming Mushroom Shape in velvety, finely pleated ribbon round brim, finished with loops at side. In black, new beaver, tan, red, royal, squirrel, brown or almond. Box & Postage 1/3 **Sale price 12/11**



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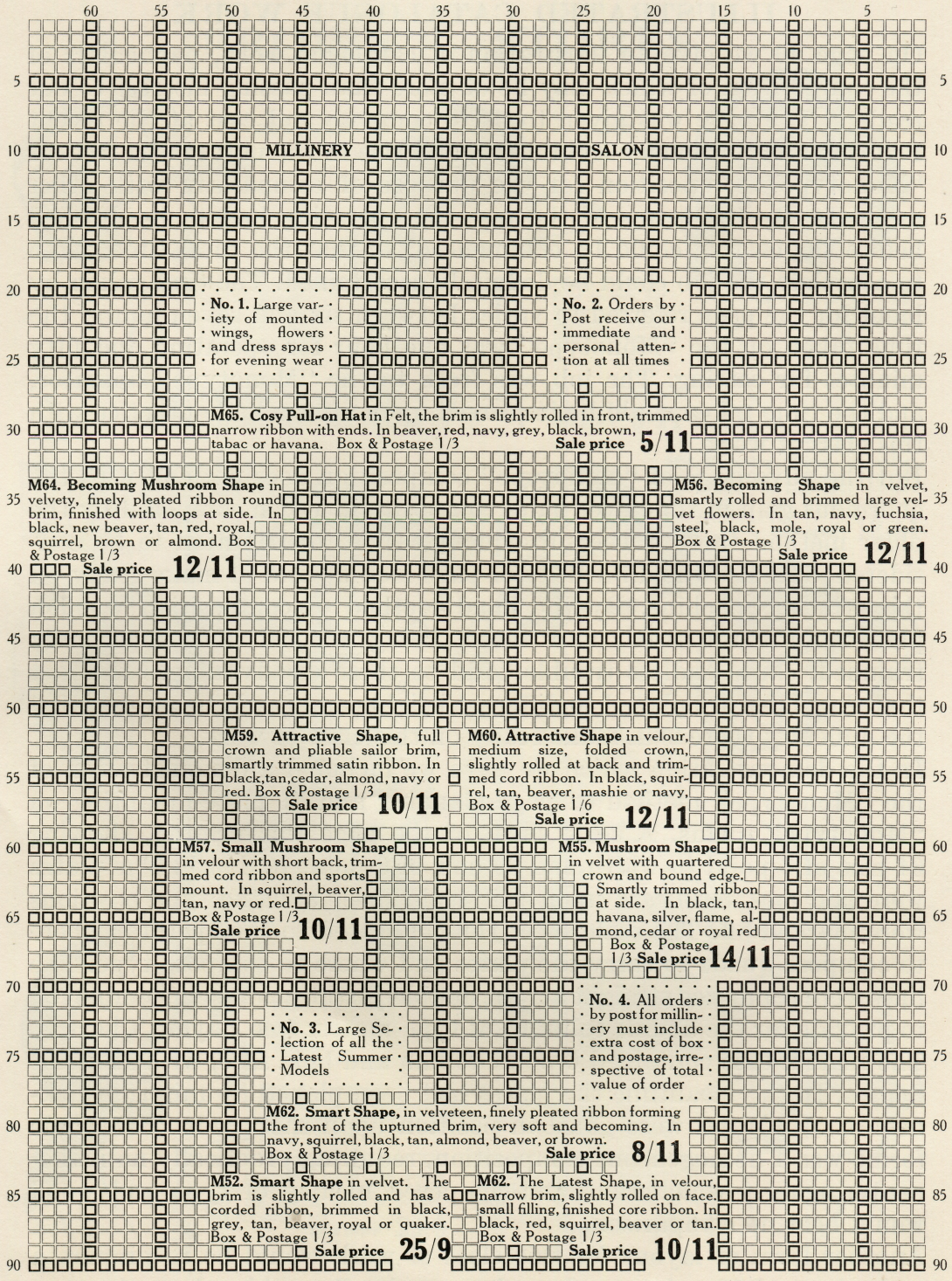
ILLUSTRATED CATALOGUE WORK

On page 20 we give an illustration of catalogue work, particulars of the composition of which may be of more than passing interest to our readers. The page was given to us to compose and cast at the recent Printing and Stationery Exhibition, and was in the nature of a test for "Monotype" composition for the purpose of comparison with other methods. By the terms of the test the operating had to be finished before the casting could be commenced, so that the total time taken to complete the job could be definitely ascertained. The time taken by hand for the page referred to varies between six and seven hours; the time taken on the "Monotype" was one hour for operating and fifty minutes for casting. The job was fresh to the "Monotype" operator, and the time taken could be improved upon after a little practice with this class of work.

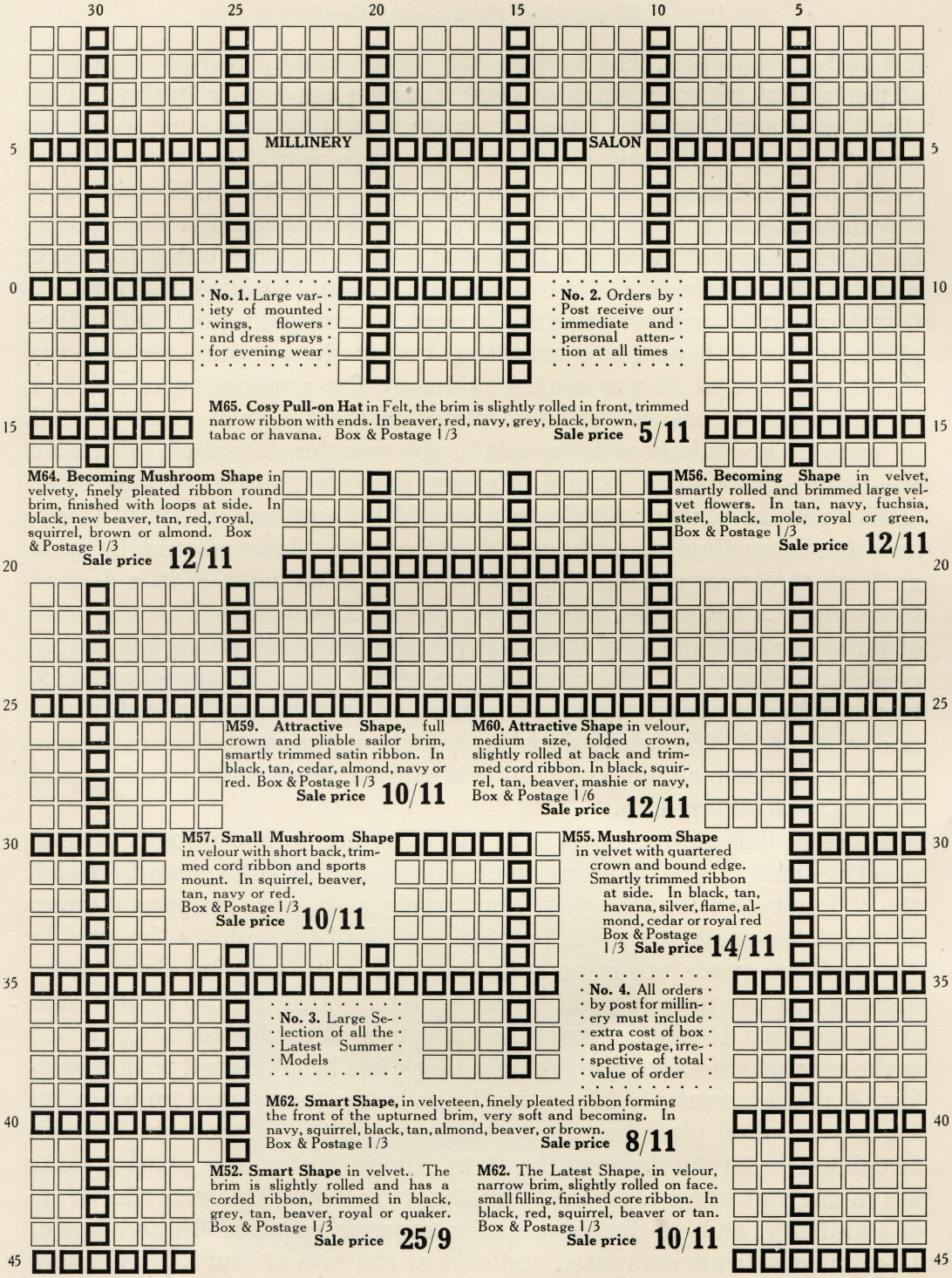
But the advantage of "Monotype" composition does not end with the enormous gain in time over hand composition. When composed by the older method there is the subsequent cost of distribution to be considered, and also the difficulties of page lock-up and of make-ready on the printing machine. By the hand method of composition wooden plate-mounts are used, and these, being warped and imperfectly trimmed, cause endless trouble. Add to these disadvantages the fact that the plates are planed to different heights and it will be appreciated the difficulty there is in make-ready on this class of work.

In the demonstration which we gave we included a demonstration of the "Monotype" method of page-planning and of plate-mounting on "Monotype" quads. A scale sheet of the page was printed, showing 64 ems of 6-point in width and 90 ems of 6-point in depth. The plates were laid *face downward* upon this scale sheet and the type positions were marked off. The scale sheet thus indicated to the operator where to compose quads to carry the plates and where to compose type. The lines were composed straight across, double-justification being employed to provide for the double columns of type matter (see Layout Chart I). The matrix case contained 6-point roman and bold face, with 12-point figures. In the meantime the plates had been planed to uniform thickness of .048″, and were glued in position upon the quads. The whole forme was a homogeneous composition, requiring practically no make-ready, against which the hand-composed medley of type and wood would bear no comparison.

Another form of layout for this class of work would be to prepare a scale sheet of 12-point quads and to mark off on this where the type



LAYOUT CHART NO. I



LAYOUT CHART NO. II

has to be positioned. The type would then be composed to the width of the widest measure (in pica ems), tapping em quads at the end of the short lines. Pages of 12-point quads would be cast corresponding with the page width and depth, and the type would be dropped into position as indicated on the scale plan, the superfluous 12-point and 6-point em quads being thrown away. By this method less time would be taken in operating at the keyboard and in casting, but this would be set-off by a little extra time taken in make-up (see Layout Chart II). Overseers and operators might do well to study method and page-planning, as well as plate-mounting on quads, as some firms have saved as much as 50 per cent. of time by the application of method in this form of composition. The plates in the specimen page printed on page 20 are mounted on quads in the manner described, which we advocated in detail in THE MONOTYPE RECORDER of May-June, 1922. Half-tone, line plates, and electros should be uniformly .048″ in thickness for mounting on high quads; stereotype plates should be of a uniform thickness of .166″ for mounting on low quads. If it is desired to mount the half-tones, line plates, and electros on low quads a layer of mill-board should be placed between the plate and the quads of the correct thickness to bring the surface of the plate to type height. A thin even layer of seccotine may be used as an adhesive for both plates and millboard. Operators desiring a little practice at this catalogue work are recommended to set up this sample page in the two forms of composition referred to.

The use of "Monotype" quads as plate mounts is becoming a general practice, and this is by no means the least of the many uses to which the "Monotype" may be put. For large plates, such as page stereos, 36-point em quads are used, but for small half-tone plates the smaller composition quads are more suitable. The latter may be elevated by underlay at the precise point where a plate is printing too lightly, and such underlay does not permit the plate to rock during printing, which is the case where only a portion of a block has been treated with underlay. A plate mount of "Monotype" quads has many economic advantages over wood plate bases, especially where the latter must be sawn to coincide with the shape of the plate. All kinds of patent plate-mounts are in use, but bases composed of "Monotype" quads possess the virtue of simplicity, and can be composed to any size required. Plate bases of 12-point quads are composed and cast at the rate of four square inches per minute.

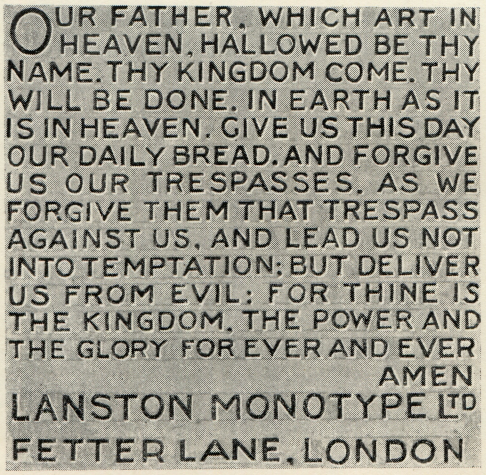
A MARVELLOUS ENGRAVING FEAT

We often hear the praises sung concerning the marvels of handcraft, but, considerations of art apart, it must be admitted that for accuracy and precision the best of handwork compares very unfavourably with the possibilities of machine production.

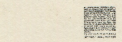
Hand engravers pride themselves upon being able to engrave the Lord's Prayer upon a three-penny piece. They would, however, without hesitancy deny the possibility of engraving it in relief on the end of a piece of steel having the area of a 12-point quad. As an example of the latter we distributed at the recent Printers' Exhibition types cast from matrices struck by a hardened steel punch having the Lord's Prayer engraved in relief upon its end. The letters on the punch, and consequently on the types, are on a body forty-three one-hundredths of a point and stand up from the base of the type eight ten-thousandths of an inch.

The distribution of these types was the cause of considerable amusement. Unable to discern any reading upon the end of the quad, many thought the reference to the Lord's Prayer was a joke on our part, the subtlety of which they could not fathom; others thought they could just discern the lettering the while they were looking at the foot of the type!

We show a photographic enlargement of the type referred to, the magnification being 225 times the size of the original. The engraving of the punch proves that the punch-cutting machine is most accurately constructed, and that all moving parts are without "shake" otherwise the type would be blurred and indistinct.

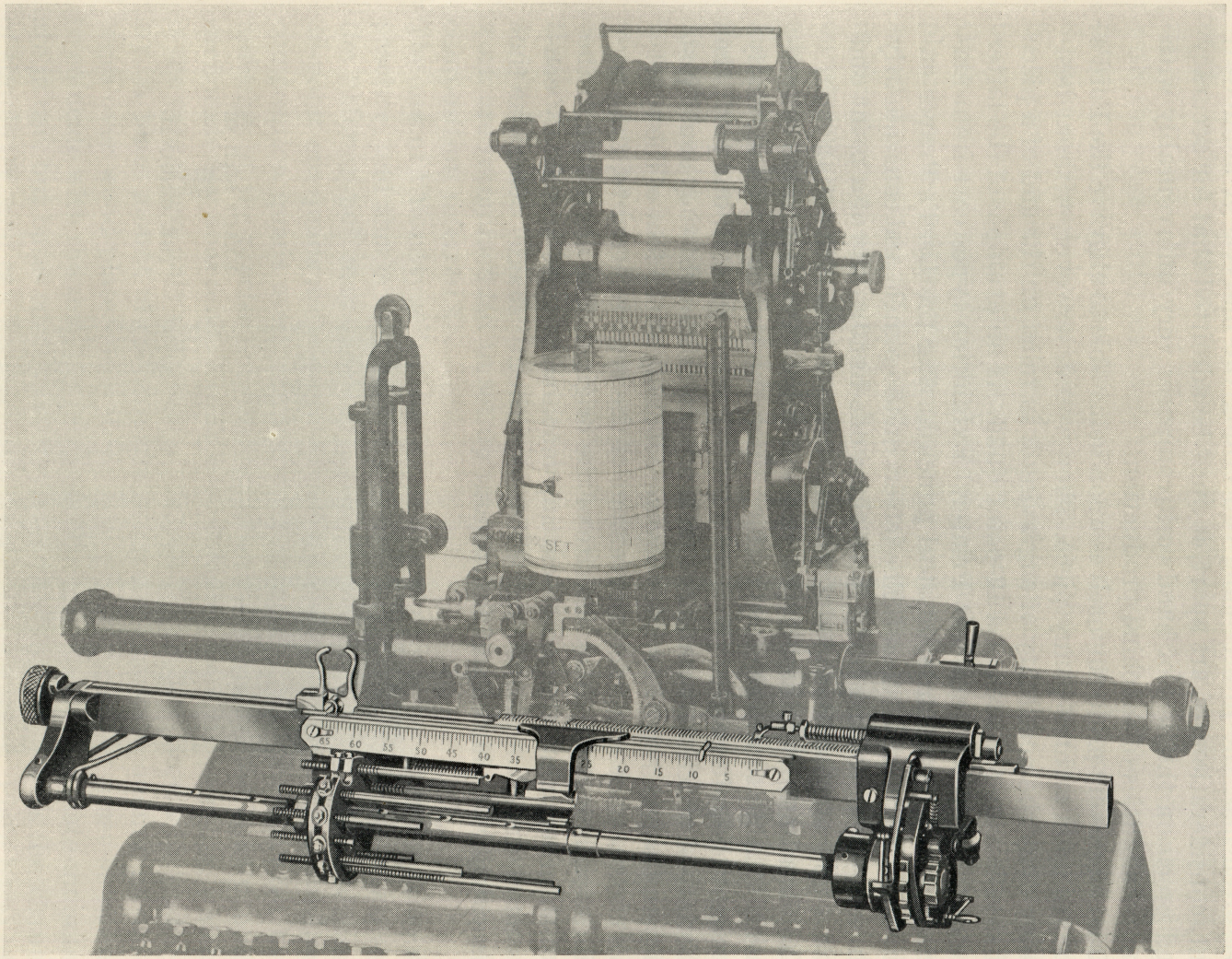


EXACT SIZE OF



THE ORIGINAL

MAGNIFIED 225 TIMES



"MONOTYPE" TABULAR COMPOSITION DEVICE

"MONOTYPE" TABULAR COMPOSITION DEVICE

The "Monotype" has always been noted for the great variety of tabular composition it is possible to produce on it. Many tables are composed on the machine at a faster rate than straightforward composition, and, as many quads are generally used in tables, the output often reaches from 12,000 to 15,000 ens per hour.

An attachment is now provided for the keyboard which renders the work of tabular composition even simpler than it has been, although most operators may have thought that it was already simple and easy enough. During tabular composition a certain amount of manipulation of the unit wheel and justifying scale is necessary, and the tabulating device has been designed to obviate this, and thereby save the accumulated time taken for such manipulations. The "Monotype" tabulating device makes the work of erstwhile intricate composition, even where the columns are all in different measures, an extremely simple operation, and the saving in time in this class of composition (such as, for example, the "Telephone Directory") is sometimes more than 25 per cent.

The device is located in front of the em scale, and consists of a series of adjustable stops positioned around a common axis. There are twelve of these stops, any number of which may be brought into use, according to the number of columns in the table, and each stop is adjusted to the em scale so that the column which it represents will be composed to the correct length. Thus, if a table consists of seven columns, as the composition of each column reaches completion the set of stops is partly revolved, and the stop for the next column is automatically brought into position. This action is repeated at the end of each column until the seven columns are composed, and the set of stops is then automatically reversed so that the stop representing the first column is again brought into position. When wishing to revert to straightforward composition the stops may instantaneously be put out of action.

To those firms who do much tabular composition a possible increase of 25 per cent. in keyboard output is a consideration not to be ignored, as the device will quickly pay for itself.

The price of the device is £35, but as the demand has been so unexpectedly great we cannot undertake to guarantee delivery under three months from date, when we hope to stabilise the supply. Orders will be executed in the sequence of their receipt by us.

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