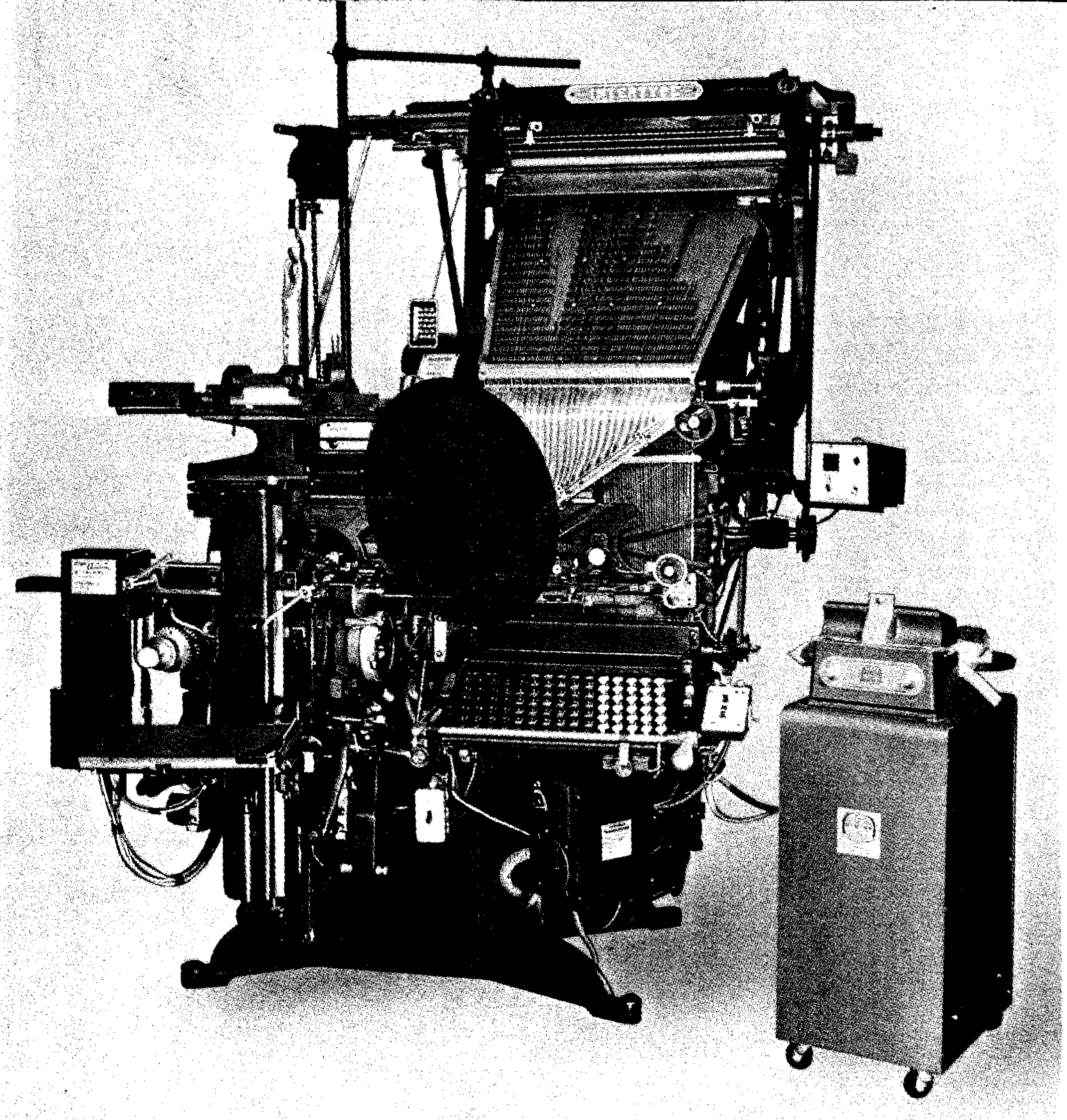
# SHOP TALK

VOLUME 5 NO. 2



## ATTENTION LINOTYPE MACHINIST

Linecasting STAR ★ PARTS Automation

STAR PARTS Co. SOUTH HACKENSACK, NEW JERSEY

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# SHOP TALK

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South Hackensack, N. J.




Text of this issue of SHOP TALK set in 9 pt. Star News.

## A FEW HISTORICAL COMMENTS

Although many radical changes are occuring in composing room equipment today, many of the basic principles of hot metal composition have remained unchanged for nearly 80 years. Other of our composing room operations and traditions have a history stretching back several centuries.

For instance, journeymen compositors who hand-set the first edition of the King James Bible, or who were employed in European printing houses at the time the Pilgrims landed, would have little difficulty as hand comps today. Our type, typecases, composing sticks and other related equipment are nearly identical to those used over 300 years ago. There were maintenance machinists in those days too. They kept their equipment lubricated with salad oil, applied in just the right amount by means of a feather.

Prior to mechanization, the operation of a printing press was hard, physical labor, and 17th century compositors liked to needle the pressmen because of the heavy work involved. However, hand comps were specifically forbidden, under penalty of a fine administered by the chapel, from delivering an occasional bundle of hay to the "horses" who ran the presses.

Although Ottmar Mergenthaler invented the first successful linecasting machine, the idea of slug casting preceded his invention by at least one hundred years. (One eminent authority states that Gutenberg, in 1440, cast slugs from hand-assembled matrices).

However, the idea of the slug was largely overlooked, and practically all early inventors applied themselves to the assembly of foundry type. Some of them used piano-like keyboards to release foundry type, in proper sequence, from chutes. These very early machines had no means of justifying or distributing type and these two operations were usually performed by apprentices. It is interesting to note that the problem of transpositions during assembly was recognized at a very early date, and one of the solutions is shown in illustration **C** on the back cover.

Subsequently, several operational keyboard and distributing systems were developed, using combinations cut into the side of the type, but the problem of automatic justification defeated most inventors. It was not until the invention of the circulating matrix and the wedge spaceband that automatic justification was commercially successful. These made the linecasting machine practical and remain the heart of the hot metal machine today.

We have illustrated a few early and not-so-early composing machines on the back cover of this issue of Shop Talk. We will publish the names, dates and brief descriptions of these machines in our next issue. Meanwhile, some of our more inquisitive readers may want to do some research on their own, and we offer a $25.00 prize for the letter mailed to the editor before Sept. 1st with the most complete identification of these machines. In case of a tie the earlier postmark will have preference.

# ADJUSTING FOR SMOOTH MATRIX AND SPACEBAND ASSEMBLY

BY QUIDO E. HERMAN

## ADJUSTING ASSEMBLER SLIDE FOR LINE LENGTH

A considerable amount of damage is done to spacebands and mats because of tight lines. In order to determine whether a line is tight or not, some standard must be set for assembler slide length. One simple method is to use a slug, place it in the assembling elevator and adjust the line length so it will just stop the star wheel. A more accurate adjustment can be made by assembling a line using one spaceband, setting the line tight enough that the star wheel will just "sputter", then adjusting the slide so that the top of the spaceband wedge will justify even with the top of the first elevator jaws. When setting a line to an exact length, you will find that a lower case "f" is usually halfway between an en space and a thin space in thickness.

This adjustment should be made with a new star wheel but because of wear in the star wheel the length of line in the assembling elevator will constantly increase, causing tight lines at casting. For this reason, it is important that the assembler slide setting be checked every week or so depending upon the amount of type set.

Much assembler trouble can be eliminated by using a star wheel with a narrow prong such as Star D-6 or D-5210, the latter being 1/16″ oversize. If you have a supply of the old style star wheels with the wide prong surfaces, you can dress off the leading edge (toward the mat) so that the end of the prong which contacts the mat measures approximately 6 points in width. This bevel, also helps in pushing the matrix to the left and reduces by approximately 1/2 the possiblity of a spaceband striking the top of the star wheel as it attempts to enter the assembling elevator. The use of the narrow type star wheel, which we supply, has greatly improved matrix assembly, in many instances.

## THE CHUTE FINGER

Probably no part of a typesetting machine has had more adjusting, bending, straightening and discussion than the chute finger and its adjustment. No doubt this part is one of the least understood, and receives the brunt of complaints of operators and machinists, and is innocently blamed for problems resulting from the irregular assembly speeds of various word and letter combinations.

As mentioned in previous articles, if something is working to your satisfaction, leave it alone—if not, the following is presented as a guide and explanation of the function and adjustment of the chute finger, and is the result of experience in the adjustment of the assembling mechanism of over 1,000 typesetting machines of various makes and models.

## LINOTYPE ASSEMBLER CHUTE FINGERS D-2273 & D-5446

The above part numbers cover the chute finger which is adjustable by means of a cone-shaped adjusting screw D-2276. This type finger has two prongs extending from the base of the finger. The two critical areas of adjustment are the location of the tips of the prongs and the heel of the chute finger.

The purpose of any chute finger is to control the matrix from the delivery belt into the assembling elevator, during which time the matrix must turn to assemble in as nearly vertical position as possible, and be controlled in its motion, to permit the entry of spacebands into the line. If you were to sight the assembly of mats (eye level with chute finger) you will find that almost every mat will have its upper lug move straight to the left from the tip of the chute finger prongs. It follows, therefore, that the location of the tips of the prongs is critical. If the prongs are too high, there is the possibility of the mat jumping out of the assembling elevator, if it is too low, it causes an obstruction and consequent piling up of the mats in the assembler. The heel of the chute finger must have sufficient clearance from the assembler chute rail to permit the mat to pass without undue drag or hesitation.

Here is a simple way to achieve these adjustments: Turn the star wheel until one of the prongs is in the exact "9 o'clock" position, use a thin mat, placing the bottom of the mat against the assembler slide short finger and the tip of the star wheel. With the heel of the chute finger approximately 8 to 10 points (.112″ to .140″) from the assembler chute block rails, the top lug of the mat should just contact the tips of the prongs on the chute finger.

On many Linotype machines there are two sets of holes for location of the chute finger and the holes which come closest to the above setting should be used. The prongs can then be bent to the exact measurements. If small mats are used, it may be necessary to drop the heel clearance to approximately 8 points (.112″) which may require repositioning of the prongs. Always adjust the chute finger to the font of mats most used, the other fonts will necessarily have to be a compromise unless the adjustment is changed for each matrix size.

It is important that the prongs of the chute finger are straight, and that there is no wear in the finger which will permit it to vary in its front-to-back location. The distance between the prongs must provide clearance for a spaceband, yet must be close enough to offer contact on both the upper lugs of a mat at all times, while passing under the chute finger. This may take a considerable amount of straightening, and adjustment, but if you are having trouble, there is only one way to correct the job and that is to do it right.

## CHUTE FINGER SPRING ADJUSTMENT

The spring, which controls the tension of the chute finger, must be strong enough to return the finger to its normal position as each mat passes under the chute finger. A weak spring will prevent the finger from returning to normal position, consequently it is impossible to have a guide for the following mat, with the result that the mats cannot assemble properly and sometimes may even jump out of the assembling elevator. Because the spring can only be adjusted in terms of a complete revolution, it may be necessary to remove the spring several times, cutting it off and rebending in order to achieve the proper tension. The spring must not be adjusted so tight that it will not raise when a large mat passes under the heel of the chute finger, yet it must be strong enough to snap into normal position as soon as a large mat is assembled.

## LINOTYPE CHUTE FINGER D-3318

This is the type finger which "straddles" the mats as they enter the assembler and is used on many machines where a wide range of type sizes are used. The design is such that the sides of the finger control the lugs of the mats only, and no part of the finger contacts the body of the matrix. This type finger is not adjustable, nor need it be because the thickest lug of a mat can pass under the finger, provided there is clearance of approximately .100″ or approximately 8 points between the heel of the finger and the assembler chute rails. Again, the tip of the finger should be located approximately the same as the previous style chute finger and some fitting or grinding may be necessary to achieve this position.

When the chute finger is correctly positioned, there should be approximately a 20 degree angle on the bottom of the chute finger, the same as the previously discussed finger.

The most common problem with the D-3318 Finger is weakness of the spring D-3319. This spring must be quite strong, in order to return the finger to normal position after it is struck by a large mat. As a matter of fact, if this finger is correctly positioned, it is possible to assemble matrices successfully with absolutely no motion of the spring or finger, inasmuch as there is no instance when the lug of a mat is wider than the .100″ clearance mentioned above. This spring can be easily tightened by using a needle-nosed pliers, pulling the spring down while it is in normal position. 3/8″ to 1/2″ off the spring is not too much in most instances, as the only purpose of the spring is to cushion large mats as they pass.

Part of the assembly required with the D-3318 finger is the D-3317 assembler entrance plate guide, assembled. This comprises the first partition on the assembler front and has two springs, on the bottom, which guide the mats under the chute finger. To adjust, use duck-bill pliers, and bend the upper short spring so it does not contact the bottom spring. Next, adjust the bottom of the partition so the tip of the long spring clears the assembler chute rails by approximately 2 to 4 points (.025″ to .050″). Next, bend the upper or short spring down until it barely contacts the lower spring. This permits a very light tension on small mats, guiding them into the chute finger and assembling elevator, while thicker mats receive proportionately more tension because the short spring exerts tension in proportion to the size of the mat passing under the spring. In testing assembly on this type of chute spring, there should be no motion of the chute finger when setting lower case or small sizes such as 8 point.

## INTERTYPE CHUTE FINGER

The adjustments pertaining to the Linotype D-2273 and D-5446 are identical for the Intertype chute finger. Because the prongs are longer, remove the chute finger and place a mat between the prongs, being sure that they are spaced so they will contact the lug of the mat the entire length of the prongs. Also be sure the finger is located in such a manner that the spaceband cannot contact the chute finger prongs, and that the approximately 20 degree angle between the tip of the prongs and the heel of the finger is maintained.

The spring tension on the Intertype chute finger can be stronger than the Linotype, because the mats, on an Intertype machine, pass under the chute finger while on the matrix delivery belt and therefore have a positive drive at this point. The tips of the chute finger prongs should just clear the assembling elevator pawls when the elevator is raised.

## THE ASSEMBLER

There are several different types of assemblers used on both Linotype and Intertype machines, the primary difference being a gear ratio to reduce the speed of the star wheel because of increased speeds of typesetting machines. An intermediate or slow speed star wheel unit is desirable when setting type in excess of 8 lines per minute, or for machines which are setting display matter using mats 18 point and larger.

On Linotype machines, of older models, the star wheel driving mechanism consists of a gear, D-9, which operates between the star wheel gear and the gear on the matrix delivery belt shaft. To reduce the speed of the star wheel on this type assembler, we recommend the use of the Cook Slow Speed Assembler Unit, which is available in either the slow speed under Part No. M-6-SS which is used for display mats or for machines running in excess of 8 lines per minute, or M-6-I, Intermediate Speed for normal operation. This unit is also applicable to the old Intertype assembler which used the large drive pulley, similar to the Linotype assembler. Later Linotype assemblers use an arrangement of gears, which can be changed to vary the speed. The Cook Slow Speed Unit makes these advantages available to the older model machines.

Star also manufactures the Assembler Chute Block, Rails, and Spring which eliminates the individual assembler chute rail springs replacing them with a solid part which is easily applied. These are available for almost all models of Linotype, eliminating the soldering necessary when changing a spring, and providing a means of adjustment for clearance of the matrix delivery belt.

The Assembler Cover should fit tightly, closing the space between the pawls of the assembling elevator and the assembler cover. Care must be exercised to see that there is no obstruction of the matrix and cover at any point.

In reference to the Assembler Matrix Catch Spring, Part No. D-18, it should protrude from the hole in the casting by a very small amount, as excessive obstruction at this point can cause assembling problems. With other adjustments correct, and in cases of elongation of the hole because of wear, the hole can be filled by welding and dressed flush.

## THE SENNETT ASSEMBLER

The Sennett Assembler consists of a belt, idler, and a special chute block to increase the distance the mat is carried by the matrix delivery belt, so the mats are carried under the chute finger, by the belt. This unit is applicable to Linotype machines up to and including Model 26. It is especially advantageous on ad machines because it eliminates the problem of the transfer of large matrices under the chute finger.

The Sennett Chute Block must be dowelled to the assembler, the ball bearings and pin, which are on an eccentric, must be adjusted to eliminate drag of the belt on the separating block. Particular attention should be given to see that the matrix delivery belt does not drag on the belt support, which can cause a hesitation of the belt, with consequent assembly problems. Special belts are provided for the Sennett Assembler, which must be ordered by machine model and serial number.

## SPACEBAND BOX

While a Linotype Spaceband Box is a comparatively simple device, there are, nevertheless, certain adjustments which are critical and which require occasional checking. Before checking the spaceband box, be sure there is no excessive wear in the connection between the spaceband reed and the spaceband key lever, Part No. H-874. The holes can become elongated and looseness can occur in the lever. Many of us are guilty of using a paper clip instead of the proper pin, which also contributes to the lack of action, tending to distort the timing of the spaceband action.

The Spaceband Pawls D-186-A must be even in height, the tension of the Springs D-182 and D-183 must be uniform, there must be no wear in the Lifting Screws D-185, and the tip of the pawl must not project further than the thinnest spaceband sleeve lug. Star Spaceband Box Pawls, D-186-A, are adjustable for this critical clearance. Remember, the spaceband is lifted from the box at the completion of the action of the keyboard cam, therefore Spaceband Key Lever Adjusting Screw, Part No. D-875, can be used to control the drop of the spacebands, to a certain extent. In normal position, the tip of the spaceband pawl should be approximately 1/32" (.031") below the spaceband box rails.

## SPACEBAND BOX CENTER BAR

The center bar acts as a guide for the spacebands as they drop into the box, and as a means of adjusting to prevent two spacebands from being lifted simultaneously. This adjustment is made by adjusting the bar. The clearance should be set so a spaceband will lift without bind, yet with insufficient clearance for two spaceband sleeve lugs to pass the pins on the bar.

The spaceband chute sides, front and back, should not show excessive wear, the important measurement being a clearance between the lower portion of the rails, so the spacebands are guided into the assembling elevator without the possibility of striking the front or back of the assembling elevator. There should be approximately .015" to .020" clearance between the spaceband and the sides of the chute.

### CUTTING OFF THE LAST LETTER OF A WORD

The most frequent type of transposition is cutting off the last letter of a word such as "th eboy". The reason for this type of transposition is that the spaceband is not guided, in its chute, in proper relation to the assembling of the mats. The spaceband enters the line too far to the left, entering the line ahead of the last letter of the word. In order to correct this condition, we must control the spaceband in its fall and its delivery, keeping it to the right of the chute as far as possible and as long as possible. The spaceband chute has two adjustable lips, the top lip being the bottom portion of D-677, Spaceband Chute Plate, Short, while the bottom lip is the bottom portion of the Spaceband Chute Plate, Long, Part No. D-456.

First, be sure all spacebands are of the same thickness. Bend the top lip to the right until a spaceband will not pass. Next, bend the lip to the left slightly, until the spacebands will clear with no hesitation. We can now assume that we have a positive control of the spaceband in the upper portion of the chute. Next, bend the bottom portion of the long plate so it projects to the left approximately 1/32". An increase in this measurement tends to drive the spaceband to the left by an increasing amount and may vary with the size spaceband and speed with which the machine is operating. As a final check, stand over the spaceband box, run out about ten or twelve spacebands and note that every spaceband strikes the right hand portion of the bottom of the spaceband chute rail. You will then have positive spaceband control, and can appreciate that the upper lip adjustment will vary depending upon the size of spacebands used.

### ADJUSTING D-677 CHUTE PLATE, TOP

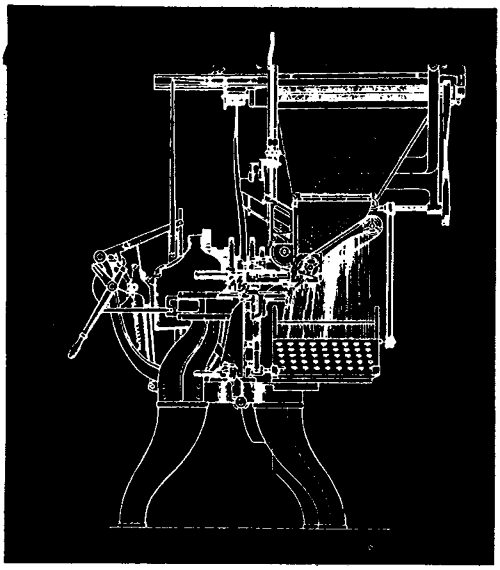
With spacebands in the box, the lower portion of the spacebands contact the tip of D-677. As the spaceband is raised by the pawls, the bottom of the spaceband must clear the tip of chute D-677 before the lugs clear the upper portion of the spaceband box rail. Because this part is of spring steel, adjustment is very difficult but is essential if correct spaceband box operation is to be achieved. When correctly adjusted, the last spaceband in the box will operate without jamming. One of the little tricks, if you are gadget-minded, is to drill and tap through the bottom of the box for an 8/32 screw, bend the plate so it clears the bottom of the spaceband, then by using a screw and lock nut under the plate, a fine adjustment can be attained. As a final check of the spaceband box, be sure that the spaceband does not contact the prongs of the chute finger at any time during its transfer from the chute to the assembling elevator.

### INTERTYPE SPACEBAND BOX

Refer to the above for adjustment of the Intertype Spaceband Chute, but because the Intertype spaceband box has no pawls, etc., it is only necessary to adjust the guide (screw on the front plate) for proper clearance, depending upon the size of spaceband used. This setting should be made by striking the spaceband key, turning the keyboard cam rollers by hand until the reed is at its highest point. Then observe through the hole provided, the relation of the second spaceband to the end of the plate controlled by the screw. You should just be able to see the second spaceband. As the cam completes its revolution, the first spaceband will then drop. It is important to keep the Intertype releasing mechanism lubricated with dry graphite, and see that there is no wear in the spaceband release pawl, pin and releasing plunger.

### SPACEBAND BOX LUBRICATION

The spaceband box on both Linotype and Intertype machines should be removed, cleaned, and inspected at regular intervals. Graphite has the ability to absorb moisture, causing a gum. If spaceband trouble exists, the spaceband box should be washed with a good solvent, inspected, and lubricated with fresh graphite.



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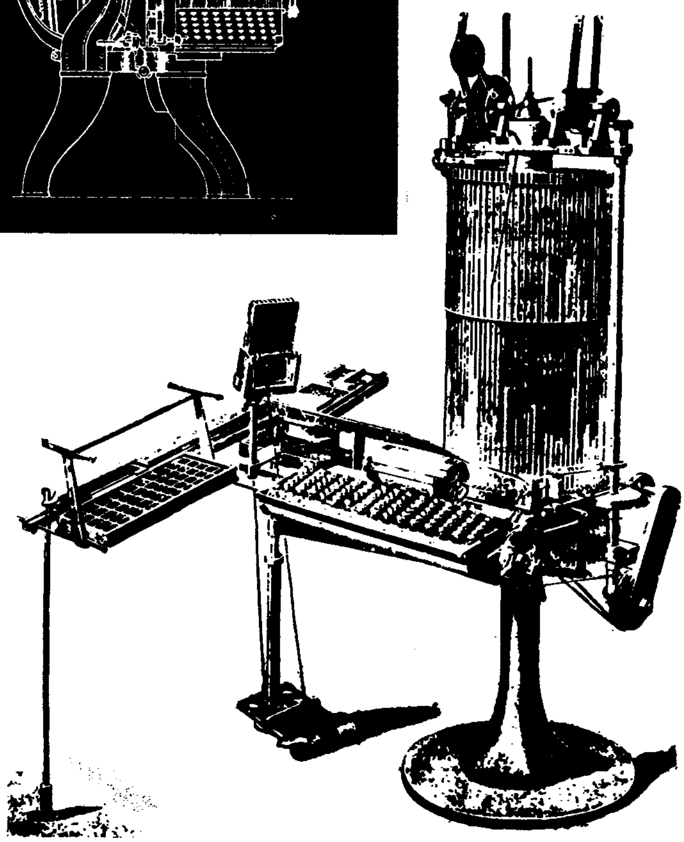

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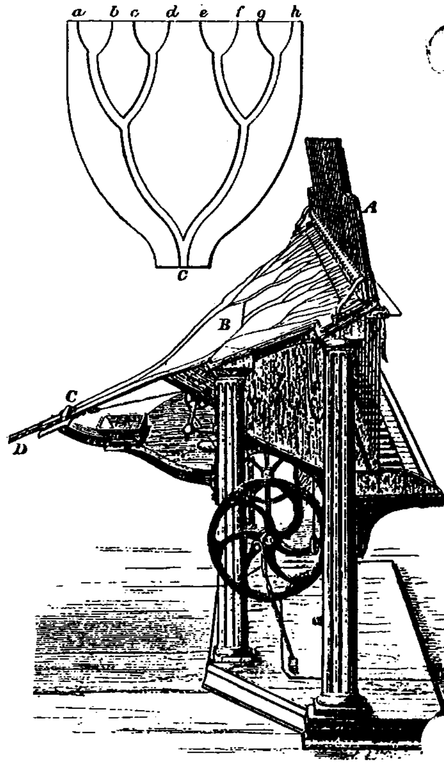


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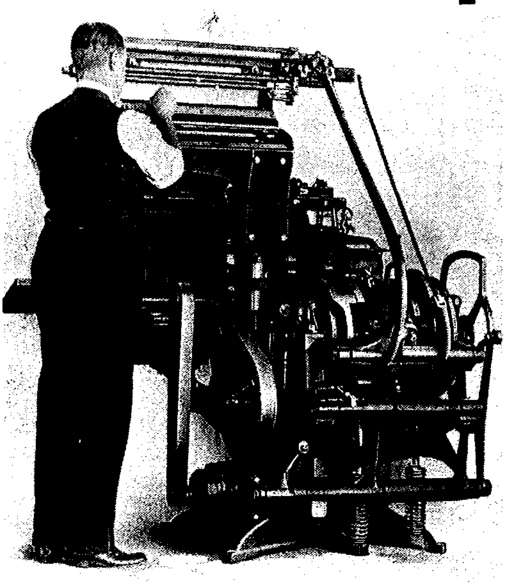

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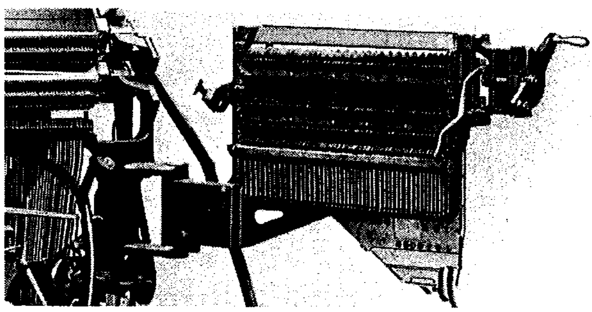

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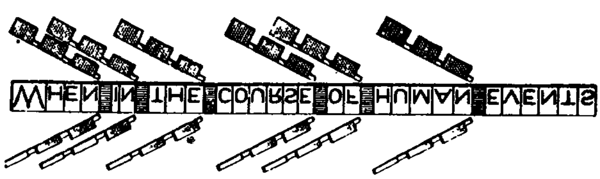


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