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The Watchmaker and his Lathe...

By H. JENDRITZKI

**with technical assistance and evaluations provided
by Marcel Bergeon**

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PUBLISHER'S NOTE www.uhrenliteratur.de

When it was first published in 1959 with the title "The Modern Watchmaker and his Lathe", this work met with immediate success. It provided makers and repairers of watches with invaluable advice and know-how, enabling them to improve both their professional expertise and their service to their customers. In step with general developments in the watch industry, however, suppliers of components came to dominate this field, downgrading the importance of making or repairing watch and clock parts on the lathe. In recent years, there has been a sharp revival of interest in restoring antique watches and clocks of every description. This development owes its existence to various essentially economic factors, in particular the sharp rise in the prices bid for such items at auctions and other sales. The lucky owners of antique timepieces came to realize that they owned genuine treasures. So it follows that restorers and repairers of such timepieces who want to carry out repairs correctly need to know exactly what they can do on their lathe. The number of requests we have received on the subject in recent times has consequently led us to prepare a new publication, "The Watchmaker and his Lathe", based on the earlier edition but entirely re-edited and updated by its author, H. Jendritzki, assisted by Marcel Bergeon, to whom we express our sincere appreciation for his invaluable assistance.

*The Publisher:
H. Marquis*

INTRODUCTION

The watchmaker's lathe is a totally self-sufficient tool, one of vital importance to all of us watch makers and repairers who still care – or are still forced – to fashion some of the components we use.

I have often noted how poorly and even carelessly many apprentices or recently qualified watchmakers use their lathe and its accessories – all the more a pity that a modern lathe does not come cheap.

However talented they may be, I find that many of my younger colleagues have been incompletely trained, perhaps because many experienced watchmakers simply do not take the same trouble to instruct their apprentices in the use of the lathe and its various tools as they do with carrying out actual work.

This situation can be a source of expensive and time-consuming failures which also have unfortunate psychological side effects.

A long series of letters to the editors of the "Swiss Watch and Jewelry Journal" from a great many countries has led me to draw up the plan of an introductory treatise on this subject which has been covered only in widely dispersed trade-press articles.

An attempt to provide a solution to this problem yielded a series of articles of a practical and topical nature, be it only because the use of a lathe obviously calls for technical and economic coherence. Though many a watchmaker today tries to cut costs by forgoing the lathe and using only ready-made spare parts, lathes will remain as useful as watch repairers choose to make them.

Naturally enough, the latter's importance varies according to its owner's place of residence: a lathe will be of less use in a town where spare parts are easily obtainable than in a remote area, far from any watch manufacturing center. Fully trained watch repairers capable of making any and every part of a watch will long continue to find a market for their skills. No customer, wherever he may live, enjoys waiting weeks and weeks for the watch repairer to receive the part or component he has ordered. This is where he will particularly appreciate the professional work he can accomplish with, and only with, his lathe.

These press articles on the various kinds of lathes, their tools and accessories along with their use and maintenance, plus the various traditional and modern working processes, have been collected and edited in order to facilitate the watchmaker's work and to increase the satisfactions he gets from it.

This book thus seeks to offset whatever deficiencies his apprenticeship may have suffered in this area. When one considers the steady and at times frantic efforts of other countries to upgrade the level of proficiency of their watchmakers, one can but conclude that everything should be done that can be done to help people who want to improve their work.

If this book achieves its intended effects, both its author and its publisher will feel amply rewarded.

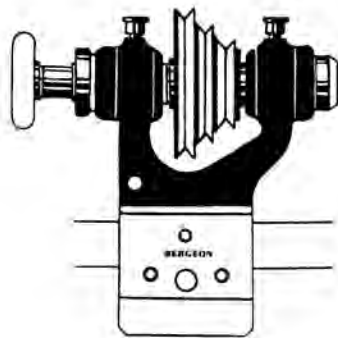
The Author

1 GENERAL POINTS CONCERNING THE WATCH- MAKER'S LATHE

Watchmakers' lathes are manufactured by a limited number of firms; however, the same general principles apply throughout, and differences generally concern details rather than the general design. A lathe may be made up in a number of ways, according to the designer's ideas and the needs of the watchmaker; each particular type has its own features, and these will prove valuable to one workman and be disliked by another.

The basic parts of a lathe are as follows:

The headstock, which is used to rotate the work; numerous accessories can be mounted on it for holding a wide variety of components.



The headstock

The tailstock is mounted at the opposite end of the bed to the headstock. It is used for supporting double overhanging workpieces during turning.



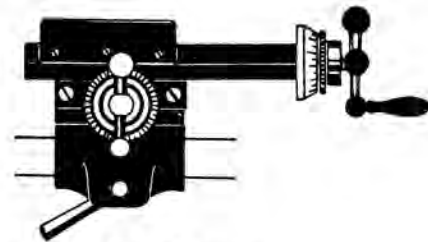
The tailstock

The hand-rest is used for supporting the graver.



The hand-rest

The slide-rest is used for holding the turning-tool in a rigid manner. Its position may be controlled by two screws and slideways at right-angles to one another.



The slide-rest

The mandrel-plate, or face-plate is provided with clamping-dogs which enable parts of any contour to be held for turning. It is used particularly for holding watch-plates and other flat parts.

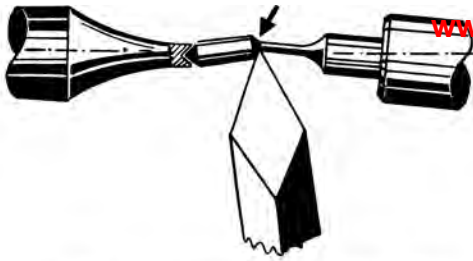


The mandrel-plate or face-plate

The lathe-bed acts as the link between the foregoing parts; its purpose is to ensure correct relative location of the centres, etc.



The lathe-bed



Risk of breaking pivot on long arbor



Lump left at end of pivot, due to excessively large back centre



Eccentric centre-sinks, used with universal runner

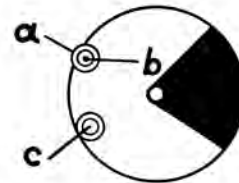
At first, an attempt was made to render the centres strong, at the same time keeping them as fine as necessary by making them triangular; this made it possible **to have the centre-sinks near to the edge**, so that they practically broke out at the point where it was necessary to reach the work with the graver.

This gave rise to the idea of **eccentric turning**; for this operation, the headstock and tailstock axes are displaced in relation to one another so that **the pivot of the work is on the periphery of the tailstock-runner**. It is thus possible to have a number of centre-sinks or indentations of various sizes on the same runner.

These sinks can be made so shallow that it is possible to turn the pivot over its entire length, and whether one is concerned with conical or shouldered pivots a chisel-pointed or radiused graver may be brought to bear; the pivot is readily accessible to it. There exist gravers of Widia steel, which are preferable to steel gravers of the traditional type. But they are delicate to handle. Widia steel breaks easily.

It is possible **to convert a normal lathe into one for eccentric turning in a variety of ways**. Apart from this, almost all normal lathes are constructed for working on relatively heavy components.

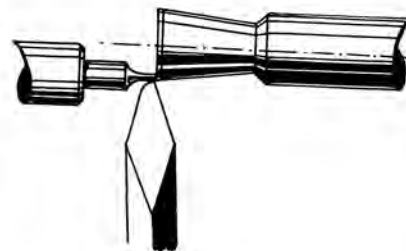
The universal runner comprises several accessories, among them the supporting-holes in the lantern-disc. It is true to say that the conical sinks in the disc often need to be adapted before use, if one is to get at the pivot without difficulty. While in this figure we have shown an accessory with centre-sinks, one finds also a disc with centre-sinks and holes, similar to those in the lantern-disc. This arrangement is very handy for turning pivots on the arbors of alarms and other small clocks.



From the triangular central supporting-centre, to the decentred supporting-centre



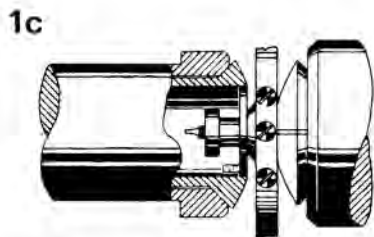
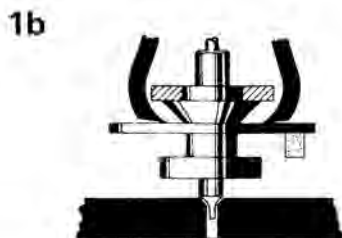
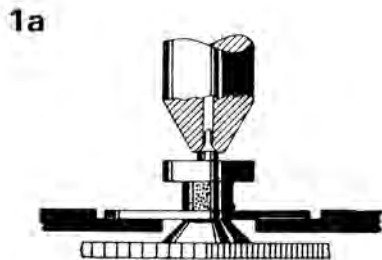
Triangular eccentric runner, showing centre-sinks



The pivot can then be turned over its entire length

14 TURNING A BALANCE STAFF

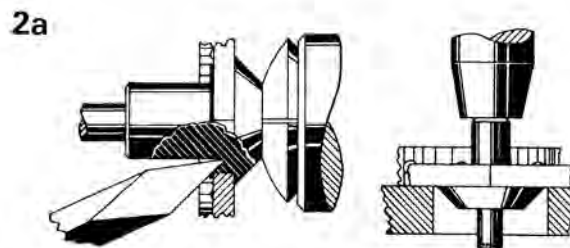
To replace a balance-staff, it is necessary to remove the old staff. The hairspring-collet can be easily removed by means of a screwdriver or, better, a pair of levers. The roller can be taken off by striking the staff with a specially made tool; a pair of tweezers with flattened and curved ends can also be used. The roller should be pushed through the balance from above (fig. 1a, b, c). In the case of a roller that is particularly hard to remove, an adequately-sized chuck may be used for withdrawing it.



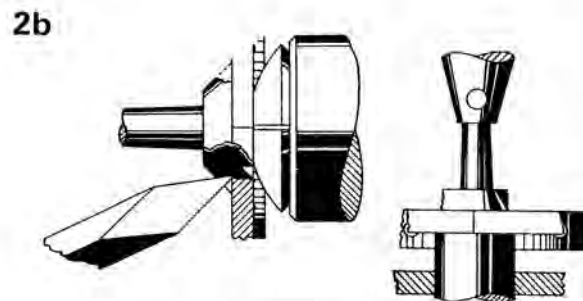
Separating the roller from the balance-staff

There are two means of separating the balance-staff: (fig. 2a) one can either turn the rivet (carefully, so as to avoid damaging the fitting-hole of the balance) and

strike the staff from above, or (fig. 2b) strike the staff from below, after having turned the seating (on which the balance rests). On account of its head-to-tail position, the balance should rest on a riveting-stake during this operation.



After turning the rivet



After turning the seating

As the raw material, one should use silver steel heated to a light-red colour and hardened in water, then tempered almost to light blue. A short piece can then be pointed at each end and turned between centres; an alternative and more modern method is to turn a longer piece which has been fixed in the chuck of the lathe-spindle.

A sketch of the proportions often makes work easier, at least at the beginning, though this may be unnecessary in the case of old staffs, which often have only one pivot missing.

It is in fact possible to use the staff that is to be replaced as a point of comparison. To measure the upper height (from the balance-seating to the end of the pivot), there is a marvellous little expedient: the staff-blank is turned back towards the cock without the top endpiece, so that the end of the upper pivot touches the top of the pallet-cock (fig. 3a, b, c).