Dec. 27, 1955 H. STAMM 2,728,187

WATCH WITH INDIRECTLY DRIVEN MINUTE HAND

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Fig.1

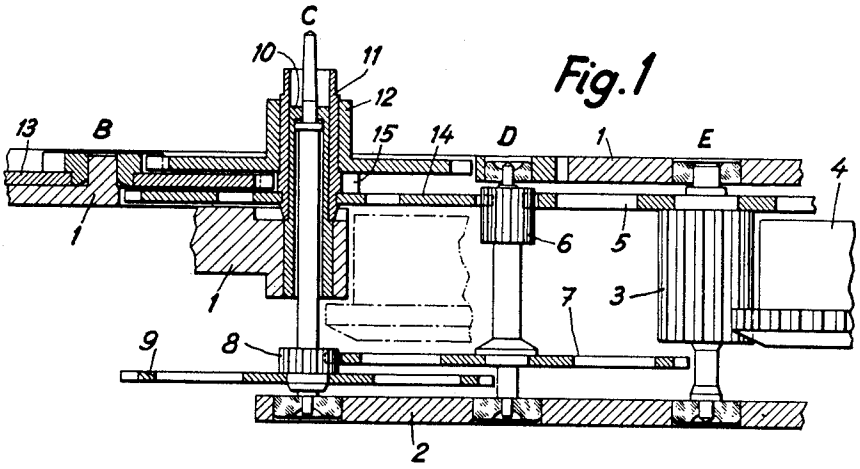
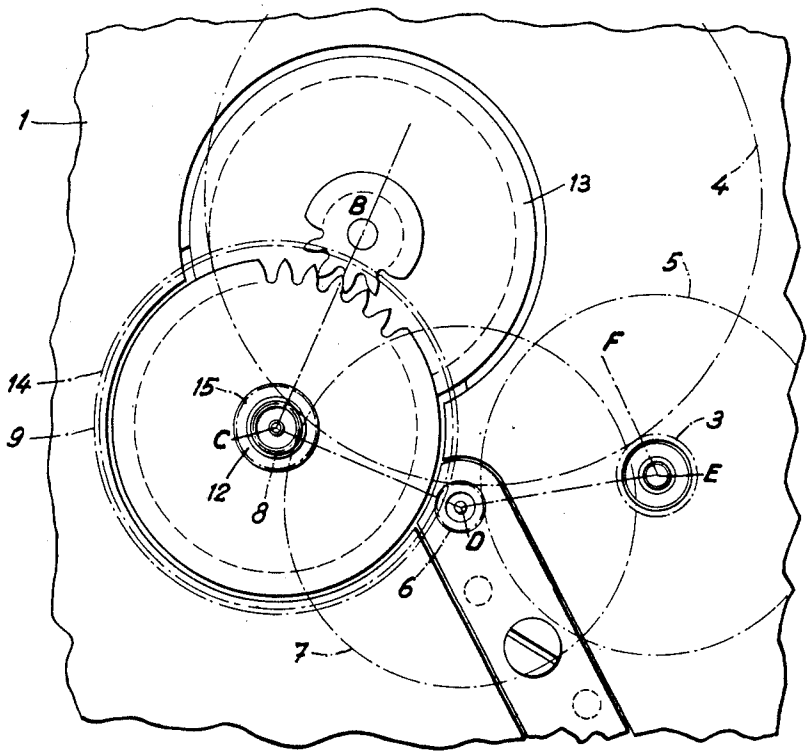


Fig.2



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Fig. 3

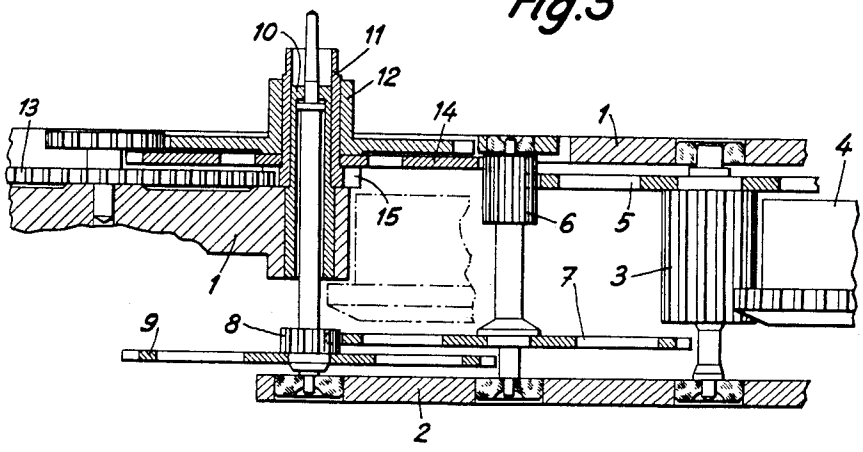
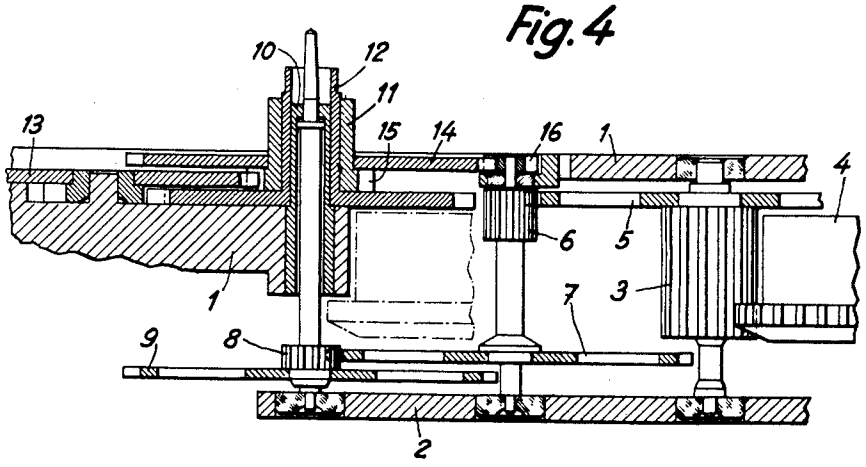


Fig. 4



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WATCH WITH INDIRECTLY DRIVEN MINUTE HAND

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Claims priority, application Switzerland August 23, 1951

3 Claims. (Cl. 58—59)

This invention relates to watches and more particularly to that kind of watches in which the minute hand is driven indirectly, being carried by a shaft or axle which is not comprised in the train of gear wheels which transmits the power of the main-spring from the barrel to the escapement.

In watches of the prior art, this so-called "indirect" drive presents the drawback that the play of the cannon-pinion carrying the minute hand, in the teeth of the wheel which drives it, can cause displacements of the minute hand of more than a minute.

It has been tried to avoid this free play of the cannon-pinion by providing a friction spring or washer between the cannon-pinion and a fixed part of the frame, but there always remains a certain lost motion between the cannon-pinion and the means which drives it. This lost motion renders a correct regulation of the watch impossible.

It is an object of this invention to provide a watch with an indirectly driven minute hand, in which the amount of shake of the minute hand is reduced in such a way that it is not noticeable any more, this reduction of the free play of the minute hand being obtained by providing a wheel on the cannon-pinion, said wheel being in meshing relation with a pinion of the train of gear wheels of the watch.

Such a wheel on the cannon-pinion has of course a much greater diameter than the normal circle of teeth of the cannon-pinion, and the amount of shake of the minute hand is consequently reduced, since the lost motion between two gears is constant and the corresponding angle of rotation of a gear is the smaller the greater the diameter of said gear.

This improvement regarding an indirectly driven mintue hand renders it possible either to make a new kind of watch which is not as thick as known watches, which both sweep second and minute hands driven directly, or to provide a watch with a greater barrel than that of these known watches.

It is known that with barrels of the same height, a watch with a sweep second is higher as a whole than a watch in which the fourth wheel is located eccentrically.

It has been tried repeatedly to avoid or at least diminish this undesirable height of watches with sweep second. However, all the improvements hitherto devised complicate the clockwork in such manner as to render it practically impossible to use them as small size watches such as ladies' watches.

When driving the minute hand indirectly according to the invention, the great wheel must no longer be journalled in the center of the movement and the intermediate bridge for journalling this great wheel in the center of the movement can thus also be dispensed with.

Since the thickness of such a movement is conditioned on the different elements, which have to be provided, one above the other, in the middle of the watch in the case of a watch with seconds and minute hands directly driven,

the following elements have to be provided in the middle of the watch: the hour wheel, the cannon-pinion, the base plate, the barrel, the great wheel, the intermediate bridge carrying the upper bearing of the great wheel, the fourth wheel with its pinion and the upper bridge carrying the upper bearing of that fourth wheel.

The improvement according to this invention allows removing the great wheel from the center and dispensing altogether with the intermediate bridge, while providing a supplementary wheel on the cannon-pinion. The place saved by this improvement can then be utilized for the barrel which can be made thicker than in known watches with sweep second and directly driven minute hand. Moreover, since there is no great wheel pinion in the center which meshes with the barrel, the latter can also be made larger than with known watches.

In the drawings affixed to this specification and forming part thereof three embodiments of this invention are illustrated diagrammatically by way of example.

In the drawings:

Fig. 1 is a developed cross-section of the first embodiment along the lines B—C—D—E—F in Fig. 2.

Fig. 2 is a plan view of the embodiment shown in Fig. 1 as viewed from above.

Fig. 3 is a cross-section, similar to that shown in Fig. 1, of a second embodiment and

Fig. 4 is an analogous section of the third embodiment.

Referring to the drawings and first to Figs. 1 and 2, the "centre" pinion **3** eccentrically located between the base plate **1** and the bridge **2** is driven by the toothed rim of the barrel **4**. The "centre" wheel **5** is in mesh with the pinion **6** of the third wheel **7** and this wheel **7** is in mesh with the fourth wheel pinion **8** located centrally in the clockwork. The fourth wheel **9** is in mesh with the pinion (not shown) of the escape wheel. The end, projecting above the dial, of the fourth wheel spindle is surrounded by a pipe **10** and is guided by it. This pipe **10** is forced by pressure into the base plate **1**, but it might also be screwed into or consist of the same piece as the base plate or might be fixed in some other manner. The pipe **10** projecting from the side of the base plate turned towards the dial carries the cannon-pinion **11** and on this cannon-pinion is located, as usoal, for free rotation the hour wheel **12**. Similarly the teeth **15** of the cannon-pinion are in mesh with the minute wheel **13**. The indirectly driven centre wheel **14** is mounted by friction on the cannon-pinion and meshes with the pinion **6**. The number of teeth of this train of wheels is so chosen that the cannon-pinion turns through 360° per hour. The wheel **14** and the cannon-pinion **11** are coupled in such manner that during the normal operation of the watch the cannon-pinion and the motion work are carried along correctly. In order to be able to correct the position of the hands the cannon-pinion can be turned with a certain friction while the indirectly driven centre wheel is at rest.

The arrangement of the different parts of the clockwork shown in Fig. 1, as regards the level on which they are located, can be modified in certain ways.

Thus, for instance, the indirectly driven centre wheel **14** might be located at a level between the minute wheel **13** and the hour wheel **12** as shown by way of example in Fig. 3. However, it is also possible to arrange the indirectly driven centre wheel **14** above the hour wheel, viewed from the dial.

Fig. 4 shows the hour wheel **12** as being mounted on the pipe **10** for free rotation. The cannon-pinion **11** with the indirectly driven centre wheel **14** fixed on it by pressure is mounted on the hour wheel for free rotation. In consequence thereof the minute wheel

pinion is located below the minute wheel 13 and the indirectly driven centre wheel is driven by a pinion 16 embracing with sufficient friction the spindle of the wheel 7.

A similar pinion seated with sufficient friction on the spindle of the wheel 7 might of course be provided also in the first and second embodiments.

I wish it to be understood that I do not desire to be limited to the details disclosed in the foregoing specification and illustrated in the drawings for obvious modifications will occur to a person skilled in the art.

I claim:

1. In a watch the combination of a base plate and a pipe in the center of this plate, a barrel, a train of gear wheels driven by said barrel and comprising a fourth wheel on a fourth wheel spindle extending through said pipe and carrying a seconds hand, and a motion work comprising a cannon-pinion formed with teeth and rotatably arranged around said pipe, said cannon-pinion carrying the minute hand of the watch, an hour wheel freely rotatable around said cannon-pinion and carrying the hour hand of the watch, a minute wheel in meshing relation with said cannon-pinion, a minute wheel pinion fixed to said minute wheel and in meshing relation with said hour wheel, and a wheel on said cannon-pinion in meshing relation with a pinion of the train of gear wheels for driving said motion work.

2. The watch of claim 1, in which the hour wheel is free to rotate around the cannon-pinion, the wheel on the cannon-pinion being arranged between said minute wheel and said hour wheel and the pinion of the train of gear wheels being the pinion of the third wheel.

3. The watch of claim 1, in which the cannon-pinion is free to rotate around the hour wheel, the wheel on the cannon-pinion being arranged above said hour wheel and the pinion of the train of gear wheels being mounted on a bracket portion of the third wheel spindle.

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