F. E. BENZING.

RECORDING LOCK.

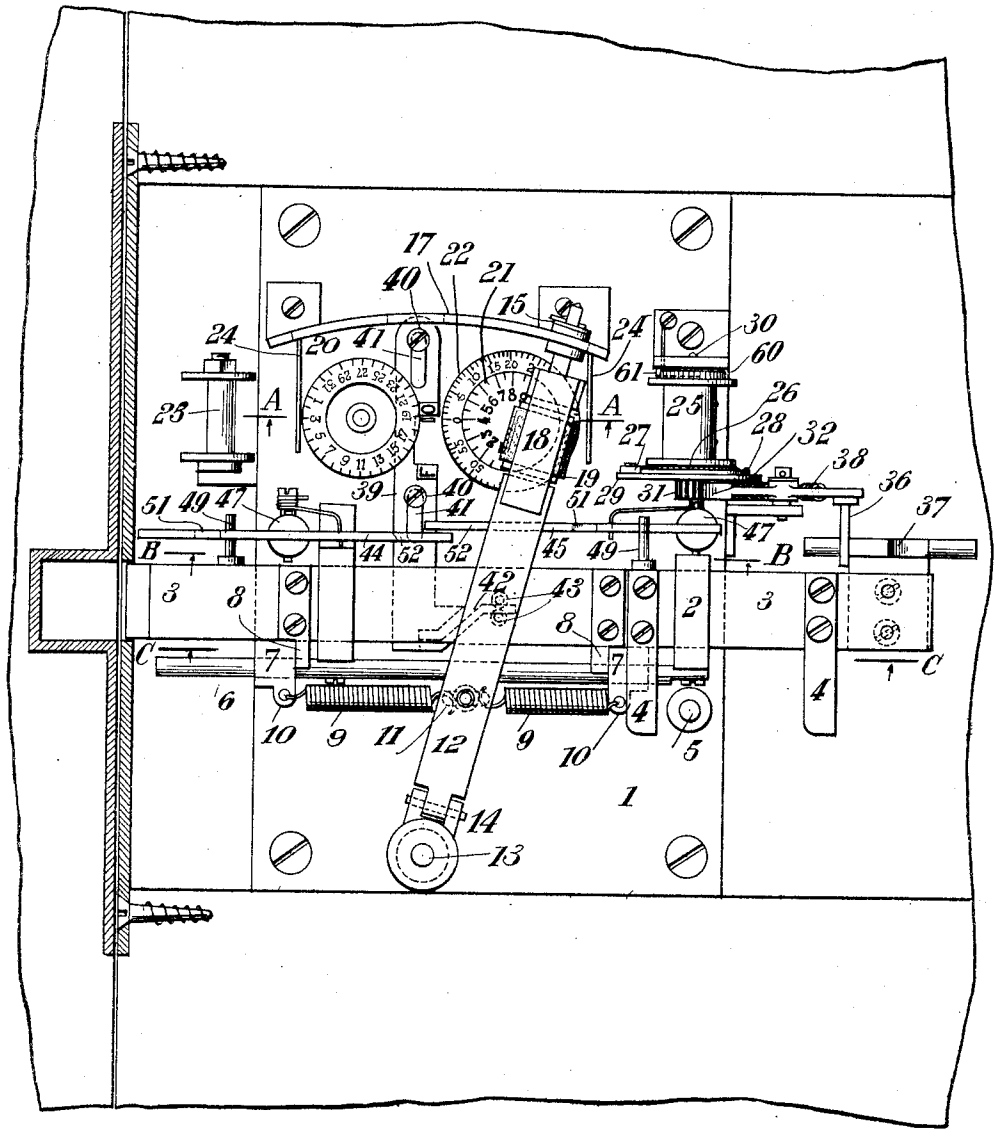
APPLICATION FILED OCT. 16, 1911.

1,037,108.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

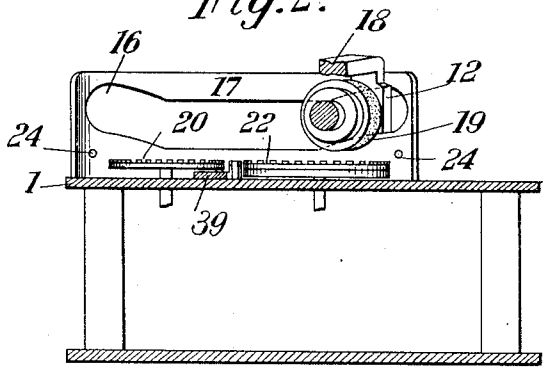


Fig. 3.

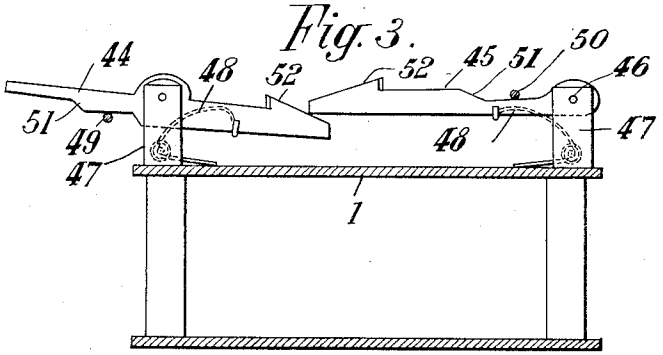
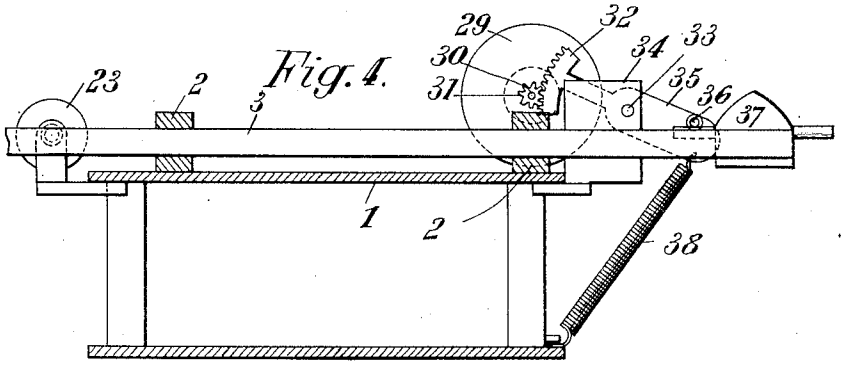


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRIEDRICH ERNST BENZING, OF SCHWENNINGEN, GERMANY.

RECORDING-LOCK.

1,037,108. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed October 16, 1911. Serial No. 654,968.

To all whom it may concern:

Be it known that I, FRIEDRICH ERNST BENZING, a subject of the German Emperor, and resident of Schwenningen, Württemberg, Germany, have invented certain new and useful Improvements in Recording-Locks, of which the following is a specification.

This invention relates to a recording lock for shop, office and the like doors which contains a device which automatically and separately registers the days, the hour and the minute of every opening and closing of the door provided with the recording lock. The printing mechanism of this recording lock is combined in such a manner with a lock bolt and a clock work that when the key is rotated in the lock and reciprocates the lock bolt, the latter while moving to the left and the right causes an inking roller to be moved over a paper ribbon or band which rests on type wheels which are independent of the clock work. The motions of the lock bolt produce besides before each printing operation the advancing motion of the paper ribbon so that the same place of the latter cannot be printed upon.

The accompanying drawing given by way of example shows one form of embodiment of the invention and in this drawing:

Figure 1 is a front elevation of the recording or time indicating lock applied to a door, the bolt being pulled back; Fig. 2 is a horizontal partial section on line A—A (Fig. 1) which shows the guides of the inking roller; Fig. 3 is a horizontal partial sectional view taken on line B—B of Fig. 1, this section showing the holding pawls for the carrying arm of the inking roller; Fig. 4 is a horizontal partial sectional view taken on line C—C (Fig. 1) and showing those parts of the lock which cause the advancing motion of the paper band.

Provided on the outside of one of the two plates 1 of a clock-work casing are two guides 2, in which a lock bolt 3 moves which carries two abutments 4, adapted to be actuated by the key which is slid over the pin 5, the latter being secured in the casing. Secured to the lower side of the guides 2 and parallel to the lock bolt 3 is a rod 6, on which sliding members 7 are mounted against which the heels 8, carried by the lock bolt 3, are adapted to abut. The said sliding members 7 serve, when they are shifted by the lock bolt through the instrumentality of the heels 8, to put the coiled springs 9 under tension, these springs being pivotally connected at one of their ends with an eye 10 of the sliding members 7 and at their other ends with a common eye 11 carried by an arm 12, which is adapted to oscillate on a pin 13 upon the casing 1 in a plane parallel to the plate of the latter. The arm 12 comprises two parts, hingedly connected together at 14 in such a manner that it may move also in a vertical direction with reference to the plate 1 of the casing. This tilting motion of the arm 12 is produced by the fact that its free end, which carries a small roller 15, enters the slot 16 in a guide 17 (Figs. 1 and 2), which slot has a straight central part and end parts which are inclined to the plate 1 of the casing.

In the neighborhood of the guide 17 the arm 12 is provided with a bent part 18 in which a roller 19 is supported, which roller is provided with a soft substance adapted to absorb coloring matter and which receives the coloring matter either from an inking pad or a suitable ink receptacle which has been provided in the bent part 18. Opposite the path of motion of the roller 19, type wheels 20, 21, and 22 are suitably supported, the first of said rollers carrying the figures designating the days, the second those designating the hours and the third those designating the minutes, all these figures being embossed so as to project from the roller. The two first named type wheels 21 and 22 are concentrically arranged to each other.

The type wheels 20, 21 and 22 are arranged in such a manner that those of their figures, which are to be printed, are very close to each other and that their rates of rotation are in the correct relation with reference to their different destination. The type wheels are rotated by a clockwork inclosed in the casing 1; this clockwork may be of any desired construction and for this reason has not been shown on the drawings. A paper ribbon passes between the type wheels and the printing roller 19, this paper ribbon being unrolled from a bobbin 23 and rolled on another bobbin 25. During this operation the paper strip or ribbon passes under two guide pins 24 which hold it on the type wheels.

Before each registration or printing operation the paper strip is shifted the length of one registration or point, this shifting being

carried out by means of the device described below.

The bobbin 25 is loosely mounted on its axis or shaft 30 and is provided at its lower end with a ratchet wheel 26, the teeth of which are engaged by a pawl 27 which is held depressed by a spring 28, and is arranged on a disk 29 which in turn is loosely mounted on the shaft 30 of the bobbin 25. Secured to the outside of the disk 29 is a pinion 31 which meshes with a toothed sector 32, the latter oscillating around a shaft 33, carried by a bracket 34 of the plate 1 of the casing, and has a tail piece 35 which carries a finger 36 projecting into the path of motion of a cam 37 which is rigidly secured to the bolt 3. The abutting finger 36 is held against the cam 37 by means of a spring 38. A ratchet wheel 60 is secured to the upper side of the bobbin 25, and is adapted to be engaged by a pawl 61 which prevents the bobbin from following the backward motion of the disk 29, which backward motion is produced by the sector 32 when the finger 36 of the latter moves along the other side of the cam 37.

The arrangement described above furthermore comprises two mechanisms, one of which serves to print the first letter of either one of the words "Locked" and "Unlocked" so that one may directly see from each registration if the latter has been made when the lock was opened or when it was closed. The second one of said mechanisms has for its object to put at every registration one of the springs 9 under tension and to store up in this manner a sufficient amount of force for imparting a violent motion to the arm 12, which until then had been held immovable by the said mechanism itself.

The letters, which show if the door has been locked or unlocked, are carried by a bar 39 which is guided by means of two screws 40, passing through slots 41. The bar 39 carries at its lower end a finger 42 which has the shape of a rod, which is first horizontally directed, thereafter rises obliquely and finally again projects horizontally. The finger 42 projects between the ends of two screws 43 which pass through the lock bolt.

The second of the mechanisms cited above (Fig. 3) comprises two pawls 44 and 45, each of which is adapted to oscillate around a shaft 46 carried by a bracket 47, which is positioned on the plate 1. The pawls 44 and 45 are continuously pressed by springs 48 against the abutting pins 49 and 50, secured to the lock bolt 3. The first named of said pins is positioned under the pawl 44 while the other one is positioned above the pawl 45. The abutting pins 49 and 50 when moving produce an oscillatory motion of the pawls 44 and 45 by sliding over the incline 51 of the latter. Owing to this oscillatory motion that of the pawls 44 and 45 which holds the arm 12 by means of its extension 52, sets this arm free so that it may obey the tractional effort of the corresponding spring 9 as this will be pointed out below, and may arrive behind the nose 52 of the other pawl, whereby the printing of the registration is produced, while the arm adjusts itself in readiness for the following action.

When all the parts of the recording lock assume the positions shown in Fig. 1, *i. e.* the opened position, if the key is slid on the pin 5 and is rotated, the bolt 3 moves toward the right and while so doing carries with it through the medium of its heel or abutment 8 the left hand sliding member 7 thus putting under tension the corresponding spring 9. The latter then remains in a state of tension until the arm 12 remains engaged behind the shoulder 52 of the pawl 45, that is to say during nearly the entire duration of the motion of the lock bolt. While the left hand spring 9 is being put under tension, the abutting pin 36 has climbed on the cam 37 and has caused the bobbin 25 to rotate through the medium of the parts 32, 31, 29, 27 and 26, and as a consequence the registering strip or ribbon has been advanced.

While these two operations were taking place, the two screws 43 which move together with the lock bolt 3 have acted upon the inclined part of the finger 42, and have thus forced the bar 39 to move the letter L ("Locked") into its printing position while the pins 49 and 50 have on the one hand pressed down the pawl 45 and on the other hand pushed upward the pawl 44 so as to allow the arm 12 to move from the right to the left under the action of the spring which has been put under tension in the manner described above. During this motion the arm 9, owing to the special shape of the guide slot 16, has exerted a pressure on the letters and figures which at this time are juxtaposed on the way of the inking roller 19, so that during the said motion all the above cited indications have been printed and registered.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is:

1. In a lock of the kind described, the combination with a lock bolt, of a printing mechanism comprising a set of type wheels indicating the day, hour and minutes, a clock work adapted to actuate said type wheels, a printing arm, springs adapted to act upon the said printing arm and to cause it to move over the said types, means interposed between said bolt and said springs to tension same by the motions of the bolt, a pawl mechanism adapted to lock the said printing arm in its extreme positions, means adapted to be actuated by the said lock bolt to release the said pawl mechanism, and

means for causing a paper ribbon to move a predetermined distance over said type wheels each time a registration has to be made, substantially as and for the purpose set forth.

2. In a lock of the kind described, the combination with a lock bolt, of a printing mechanism comprising a set of type wheels indicating the day, hours and minutes, a clock work adapted to actuate said type wheels, a printing arm composed of two parts hingedly connected together, a printing roller carried by one of said lever parts, a guide slot adapted to guide that part of said printing arm which carries the printing roller in such a manner that the roller comes into contact with a paper ribbon at the exact spot which corresponds to the types of the type wheels which are to be printed, substantially as and for the purpose set forth.

3. In a lock of the kind described, the combination with a lock bolt, of a printing mechanism comprising a set of type wheels indicating the day, hours and minutes, a clock work adapted to actuate said type wheels, a printing arm, a printing roller carried by said arm, a mechanism for converting the slow motion of the lock bolt into a rapid motion of the printing arm, this mechanism comprising two pawls adapted to hold the said printing arm at the end of its stroke, pins carried by the said lock bolt and adapted to cause the said pawls to oscillate, springs connected with said arm and the lock bolt, and means for tensioning the said springs by means of the motion of said lock bolt, substantially as and for the purpose set forth.

4. In a lock device of the kind described, the combination with a lock bolt, of a printing mechanism comprising sets of type wheels indicating the day, the hours and the minutes, a clock work adapted to actuate the said type wheels, a printing lever carrying a printing roller and a mechanism adapted to indicate at every registration if the latter has been made when the door was opened or closed, this mechanism comprising a rod carrying signs stating said indications, a cam provided at the lower end of said rod, two pins carried by said lock bolt and adapted to coöperate with said cam when the lock bolt is moved so as to bring one or the other sign of the said rod in printing position, substantially as and for the purpose set forth.

5. In a lock device of the kind described, the combination with a lock bolt, of a printing device comprising type wheels, a clock work adapted to actuate said type wheels, one of said type wheels carrying the types indicating the days, while two others are concentrically arranged to each other and at the side of the first one and carry respectively the types indicating the hours and the minutes, and a rod carrying printing signs indicating if the door was opened or closed, this rod being positioned so that the signs carried by it appear between the day type wheel and the hour and minutes type wheels, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two witnesses:

FRIEDRICH ERNST BENZING.

Witnesses:
PAULINE KLAIBER,
FRIDA KLAIBER.