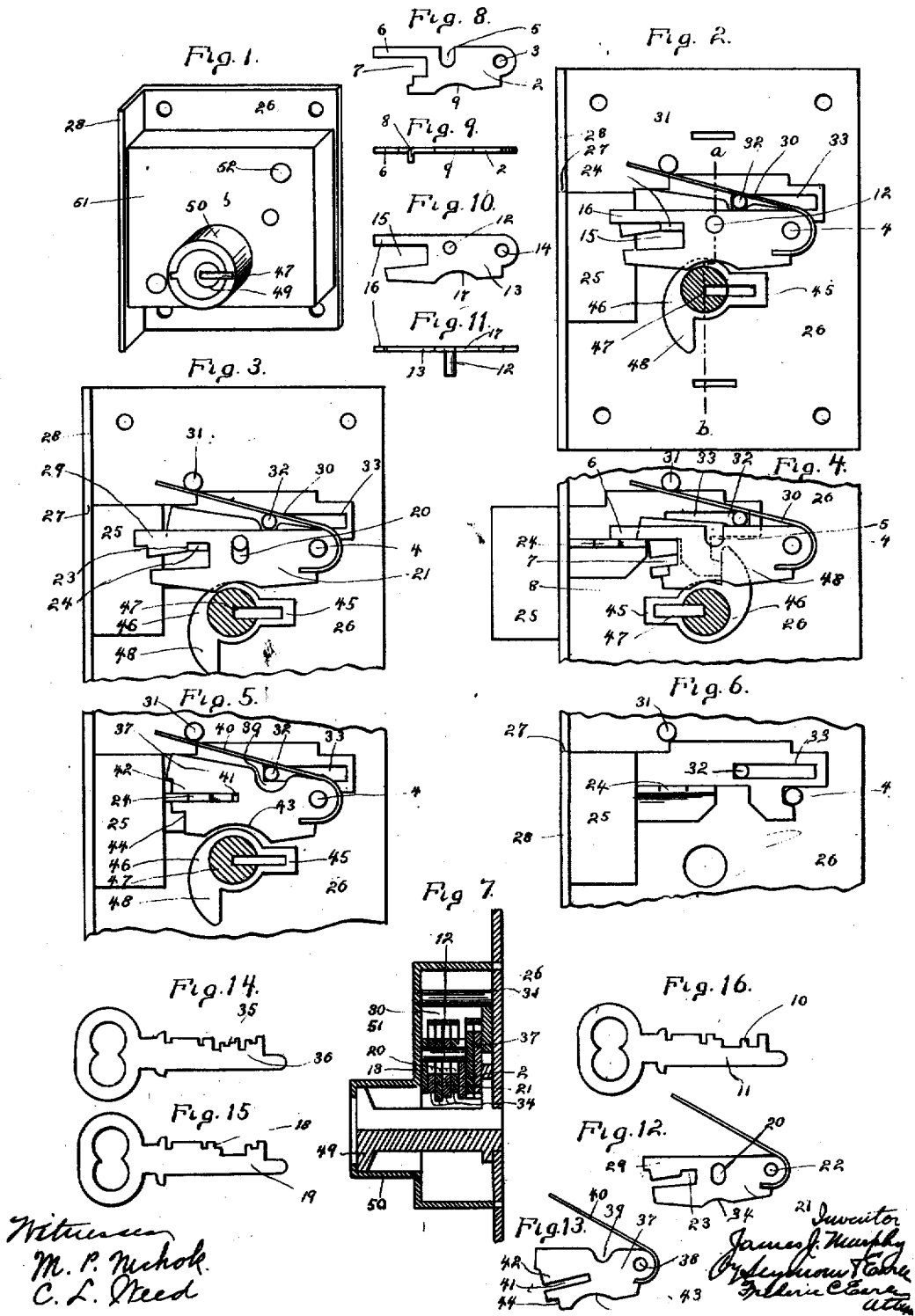


J. J. MURPHY.
MASTER KEY DRAWER LOCK.
APPLICATION FILED MAY 15, 1911.

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UNITED STATES PATENT OFFICE.

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MASTER-KEY DRAWER-LOCK.

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To all whom it may concern:

Be it known that I, JAMES J. MURPHY, a citizen of the United States, residing at Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Master-Key Drawer-Locks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a perspective view of a master-key drawer-lock constructed in accordance with my invention, looking at it from the inside. Fig. 2 a view of the lock on an enlarged scale in inside elevation with the cap removed, and the key-center in transverse section. Fig. 3 a similar but broken view of the lock with the master-key tumbler removed. Fig. 4 a similar view with the bolt in its projected position with the master-key tumbler and the change-key tumblers removed to expose the grand master-key tumbler. Fig. 5 a corresponding view with the grand master-key tumbler removed. Fig. 6 a corresponding view with the lock stripped down to the bolt. Fig. 7 a view of the lock in vertical broken section through the key-center on the line *a-b* of Fig. 2. Fig. 8 a detached plan view of the grand master-key tumbler. Fig. 9 a detached edge view thereof. Fig. 10 a detached plan view of the master-key tumbler. Fig. 11 a detached edge view thereof. Fig. 12 a detached plan view of one of the change-key tumblers. Fig. 13 a detached plan view of one of the series tumblers. Fig. 14 a view in side elevation of one of the change keys. Fig. 15 a corresponding view of the master-key. Fig. 16 a corresponding view of the grand master-key.

My invention relates to an improvement in master-key drawer locks of the class in which the locks are master keyed in groups with a grand master-key to pass all of the locks of all of the groups. For example, in a manual training school the students in any one department will have keys to the respective locks in their particular department. These keys, called change-keys, will all be differentiated from each other so that any one change-key will operate only one lock.

The person in charge of the department will hold a master-key, so called, which will unlock all of the locks in his department, but which will not unlock any lock in any other department. The head of the school will hold a grand master-key, so called, which will underlock all of the locks in the several departments. In other words, locks of the type being described are arranged in groups, the change-keys of the respective groups being differentiated so that any one key operates only one lock, and each group having a master key which will unlock any lock of the group and all of the locks in the several groups being unlocked by a single grand master or universal key.

The object of my present invention is to produce a simple, convenient, reliable, durable and strong lock of the character described, having a great range of change.

With these ends in view, my invention consists in a master-key drawer lock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I employ a grand master-key tumbler 2 formed at its inner end with a bearing-hole 3 adapting the tumbler to be pivotally mounted upon the tumbler-pin 4 of the lock, the said tumbler being also formed with an operating-notch 5, a long stop-finger 6, a clearance-opening 7, an inwardly turned operating-finger 8 and an ordinary key-sweep 9 which latter is never engaged except by a suitable bit 10 upon the grand master-key 90 11 which, it will be understood, is held by the head of the school or corresponding person, and provides access to all of the locks of all of the groups.

The operating-notch 5 in the grand master-key tumbler 2 enters the tumbler from the upper edge thereof and receives the extreme inner end of an operating or coupling-pin 12 carried by a master-key tumbler 13 provided at its inner end with a bearing-hole 14 adapting it to be pivotally mounted upon the tumbler-stud 4 aforesaid, the said master-key tumbler being also formed with a clearance-opening 15, with a stop-finger 16, and with a key-sweep 17 which latter is adapted to be engaged by the bit 18 of the master-key 19. The operating-pin 12 aforesaid passes downward through transversely

arranged clearance-slots 20 in the change-key tumblers 21 of which there are four in the lock herein shown, though this number may be varied as desired. As shown the master-key tumbler 13 is superimposed upon the change-key tumblers 21.

Each change-key tumbler 21 is formed at its inner end with a bearing-hole 22 adapting it to be pivotally mounted upon the tumbler-stud 4 aforesaid. Each of the said tumblers 21 is also formed with a gating 23 for the reception of a stump 24 carried by the bolt 25 which rests upon the inner face of the lock-plate 26, the bolt proper moving back and forth through an opening 27 in the so called selvage 28 of the said plate 26. The formation of a gating 23 in each of the change-key tumblers 21 results in the production of a stop-finger 29 for each tumbler, these stop-fingers 29 co-acting with the bolt-stump 24 for preventing the tumblers from being swung downward too far by their springs 30. The stop-finger 6 of the grand master-key tumbler 2 and the stop-finger 16 of the master-key tumbler 13 co-act with the bolt-stump 24 for the same purpose though the tumblers 2 and 13 are not furnished with springs. The upper ends of the springs 30 of the respective change-key tumblers are engaged with a spring-stud 31 mounted in the plate 26. A guide-pin 32 mounted in the plate 26 enters a long guide-slot 33 in the bolt which in this respect follows the usual construction. Each of the change-key tumblers 21 is formed with a key-sweep 34 which are engaged by bits 35 of the appropriate change-key 36.

The transversely arranged slots 20 in the change-key tumblers 21 permit the same to be operated by the change-key independently of the operating-pin 12 carried by the master-key tumbler 13 and normally located in the extreme upper ends of the said slots 20, whereby the said change-key tumblers 21 are permitted to be freely lifted with respect to the said pin. On the other hand, when the master-key tumbler 13 is operated by the master-key 19, the engagement of the upper face of the operating-pin 12 with the upper ends of the slots 20 of all of the change-key tumblers 21 operates to simultaneously lift all the said tumblers which are thus made subservient to the master-key tumbler 13 through the medium of its operating-pin 12 which reaches, so to speak, through all of the said change-key tumblers 21 and enters the operating-notch 5 of the grand master-key tumbler 2 as aforesaid.

Directly below the grand master-key tumbler 2 I locate two tumblers 37 which, in default of a better term, I shall call series tumblers, since, although they are operated by the change-key, they are employed for the particular purpose of enabling an installation of these locks to be arranged in

groups representing departments. Each of the said series tumblers 37 is formed at its inner end with a bearing-hole 38 adapting it to be pivotally mounted upon the tumbler-stud 4, a clearance-notch 39 for the clearance of the guide-pin 32, a spring 40, an ordinary gating 41 for the reception of the bolt-stump 24, a stop-finger 42, and a key-sweep 43. The key-sweeps 43 of each of the series tumblers 37, are engaged by bittings or sawings of the change-key 16 as well as of the master key 19, but not by those of the grand master-key 11. Each of the series tumblers 37 is also formed with an operating-notch 44 for the reception of the inwardly turned operating-finger 8 of the grand master-key tumbler 2, whereby both of the series tumblers 37 are made subservient to the operation of the grand master-key tumbler 2 through its finger 8, just as all of the change-key tumblers 21 are made subservient to the grand master-key tumbler 2 by its operation through the pin 12, of the master-key tumbler 13 which in turn operates all of the change-key tumblers 21 through the said pin 12.

The series tumblers 37 are provided for conferring upon the lock its capacity for being arranged in groups respectively under the control of master-keys. By shifting the positions of the gatings 41 or changing the form of the key-sweeps 43 of these series tumblers 37, the locks may be broken up into groups respectively controlled by master-keys, but as these tumblers are gated tumblers they must also be operated by the change-keys of the respective locks of the groups. In each lock, therefore, the series tumblers 37 must be operated to unlock it by its change-key, just as much as its change-key tumblers must be operated by its change-key.

In an installation of master-keyed drawer locks constructed in accordance with my invention, any particular change-key will operate its own lock and no other. When this key is used its bittings co-act with the key-sweeps 34 of the change-key tumblers 21 and lift the same to bring their gatings 23 into registration with the bolt-stump 24 and with the key-sweeps 43 of the series tumblers 37 and lift the same to bring their gatings 41 into registration with the said bolt-stump, after which the bolt 25 is projected by means of the slotted arm 45 of the plate-like cam 46 mounted upon the inner end of the key-center 47, the movement of the bolt being completed by the nose 18 of the cam. The said key-center 47 is provided, as usual, at its outer end with a circular head 49 housed within the outer end of a tube mounted in the cap 51 which is secured to the plate 26 by the screw 52. It is not essential that the alinement of the gatings 23 of the change-key tumblers 21 and of the gatings

41 of the series tumblers 37 shall be accompanied by any movement of the grand master-key tumbler 2 or of the master-key tumbler 13, since the tumblers 2 and 13 are not gated but respectively formed with clearance openings 7 and 15.

Now if it is desired to operate one or more locks, or even all of the locks in any group of the installation, the master-key of this group must be brought into requisition. This master-key will operate any lock of the group but no lock of any other group. When this master-key is introduced into any lock of its particular group, it will co-act with the master-key tumbler 13 of the group and lift the same and as this tumbler 13 is lifted it will, through the operating-pin 12 carried by it, lift all of the change-key tumblers 21 of the lock and bring their gatings 23 into registration with the bolt-stump 24. The same master-key 23 will also operate both of the series tumblers 37 of any of the group to bring their gatings 41 into registration with the bolt-stump 24. The gatings of the change-key tumblers 21 and of the series tumblers 37 having been registered with the key stump 24, the bolt is thrown as before. In this connection I may point out that the operation of the master-key tumbler 13, the change-key tumblers 21 and the series tumblers 37 by the master-key, in no wise disturbs the grand master-key tumbler 2, for the reason that at this time, i. e., when the locks are being operated by a master-key, the operating-pin 12 carried by the master-key tumbler 13 simply moves upward in the operating-notch 5 of the grand master-key tumbler 2 of the lock. I may here point out also that inasmuch as the change-key tumblers 21 are operated through the medium of the pin 12 of the master-key tumbler 13, it is not essential that the master-key itself shall be bitted with reference to the change-key tumblers 21.

In case it is desired to open any lock of any of the groups, or, in other words, any lock of the entire installation, or all of the locks of the entire installation for that matter, the grand master key 11 is brought into requisition. This key, as has been explained, co-acts only with the grand master-key tumbler 2, but as the same is lifted by the said grand master-key, its finger 8 directly lifts both of the series tumblers 37 for the registration of their gatings 41 with the bolt-stump 24. The lifting of the grand master-key 11 also operates through the bottom of the operating-slot 5 in the tumbler 2 and through the pin 12, to lift the master-key tumbler 13 which in turn, through the said pin 12, lifts the gatings 41 of all of the change-key tumblers 21 into registration with the bolt-stump 24. When, therefore, the grand master-key 11 is em-

ployed both of the series tumblers 37 are simultaneously lifted as well as all of the change-key tumblers 21, without any reference to their key-sweeps but on account of their subserviency to the grand master-key tumbler 11.

I call attention to the fact that all of the change-key tumblers 21 are directly controlled by the master-key tumbler 13, that the series tumblers 37 are directly controlled by the grand master-key tumbler 2, and that the grand master-key tumbler 2 simultaneously operates all of the series tumblers, and, through the master-key tumbler 13, all of the change-key tumblers 21. The control of the change-key tumblers 21 and the master-key tumbler 13 by the grand master-key tumbler 2 is effected by the single operating or coupling pin or stud 12 which may be so substantial in its character as not to work loose or get bent out of shape; whereas in the prior art split pins have been used for coupling the master-key and grand master-key tumblers, split pins being small, difficult to accurately put in place, and liable to get loose.

I claim:—

1. In a master key lock, the combination with the change-key tumblers thereof, of a master-key tumbler, a pin mounted therein and coupling all of the change-key tumblers therewith, and a grand master-key tumbler co-acting with the said pin for operating all of the change-key tumblers through the medium of the master-key tumbler.

2. In a master key lock, the combination with the change-key tumblers thereof, of a master-key tumbler, a pin mounted therein and coupling all of the change-key tumblers therewith, a grand master-key tumbler co-acting with the said pin for operating all of the change-key tumblers, and one or more series tumblers controlled by the grand master-key tumbler.

3. In a master key lock, the combination with the change-key tumblers thereof, of a master-key tumbler controlling all of the change-key tumblers, one or more series tumblers, and a grand master-key tumbler interposed between the change-key tumblers, and the series tumbler or tumblers.

4. In a master key lock, the combination with the change-key tumblers thereof, of a master-key tumbler, a pin mounted therein and co-acting with all of the change-key tumblers, one or more series tumblers, and a grand master-key tumbler controlling the series tumbler or tumblers and interposed between the same and the change-key tumblers.

5. In a master key lock, the combination with the change-key tumblers thereof, of a master-key tumbler superimposed upon the same, an operating-pin carried by the master-key tumbler and extending downward through the change-key tumblers for con-

trolling the same, one or more series tumblers, and a grand master-key tumbler interposed between the change-key tumblers, and the series tumbler or tumblers, and co-acting with the said pin for operating the change-key tumblers, and also co-acting with the series tumbler or tumblers for controlling the same, whereby by the action of the grand master-key tumbler, all of the other

tumblers of the lock are simultaneously 10 operated.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JAMES J. MURPHY.

Witnesses:

OTIS B. HOUGH,
HARRY C. CLOW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."