Aug. 15, 1933. J. C. MAHINDRA 1,922,897

LOCK

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Fig. 2.

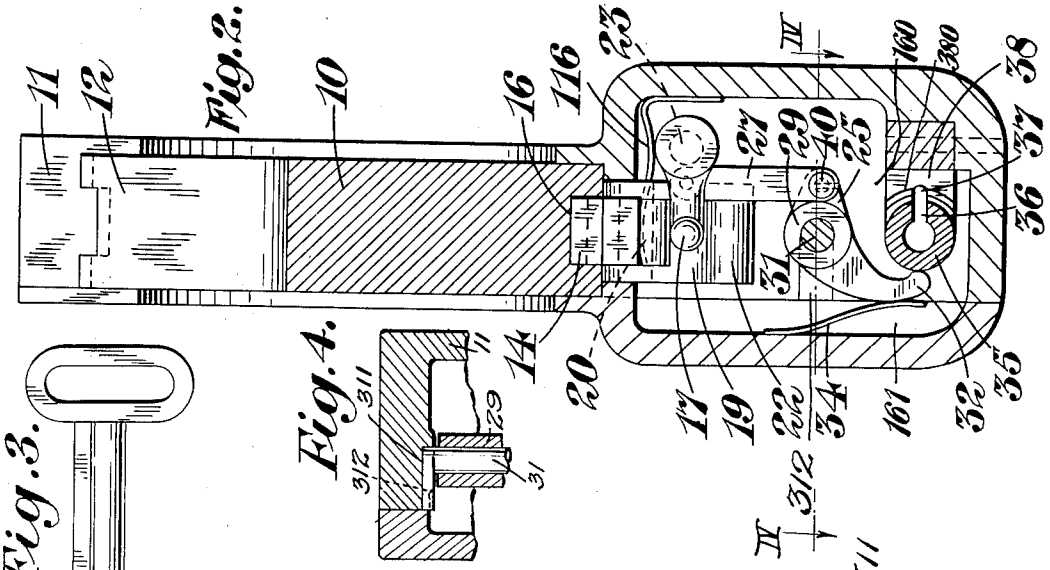
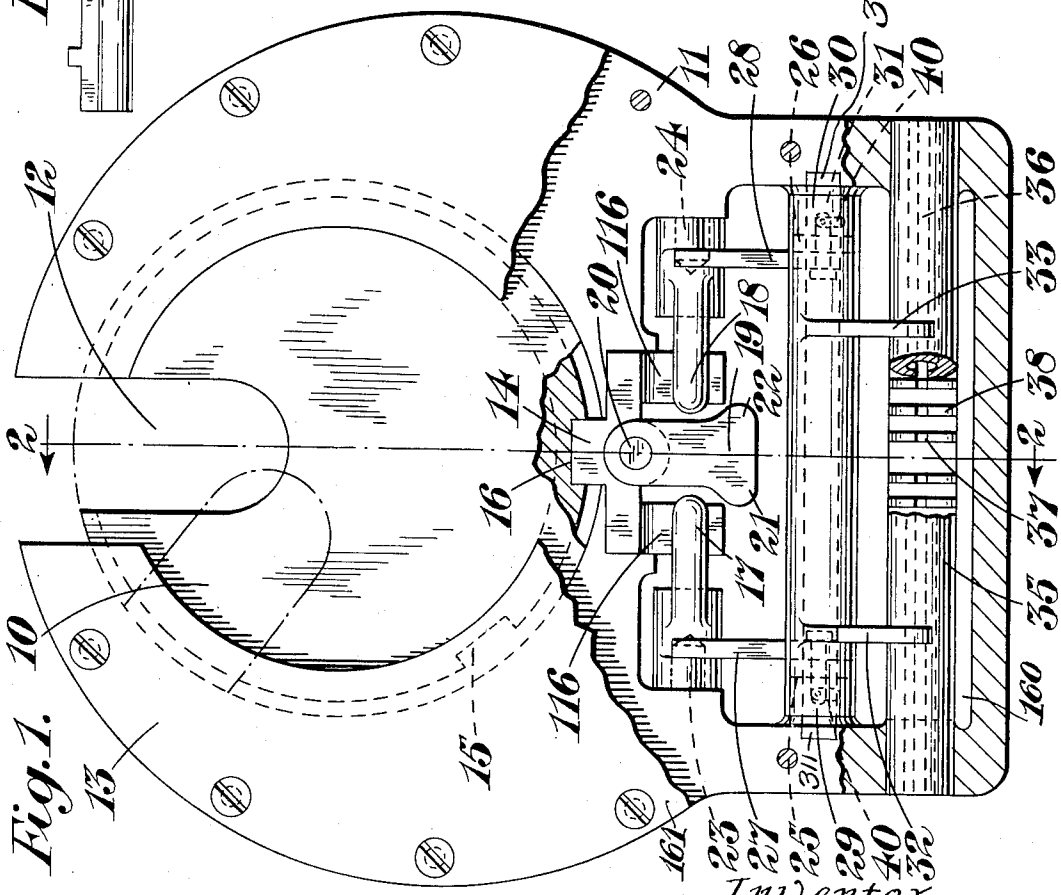


Fig. 3.

Fig. 4.

Fig. 1.



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LOCK

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2 Claims. (Cl. 70—107)

This invention is for improvements in or relating to locks and more particularly concerns padlocks for use on railway vehicles, for example freight trains. The invention has for its object to provide an improved lock which will be highly proof against opening by unauthorized hands and a general system of locking embodying the use of the new lock which will be simple and inexpensive to provide and at the same time will be very effective in use.

According to the present invention, there is provided a lock (for example a padlock) whereof the bolt-withdrawing mechanism comprises parts which are adapted to co-operate with a plurality of different keys and are capable of withdrawing the bolt only when actuated by the conjoint action of the plurality of keys.

According to a feature of the invention, the improved lock may comprise the combination with a single bolt, of a withdrawing-mechanism therefor which consists of a plurality of key-operated levers arranged each to be operated by its own key, and means yoking the levers to the bolt in such manner as to transmit thrust to the bolt, to withdraw the latter, only when the keys are operated simultaneously.

According to a further feature, in the event of the lock taking the form set forth in the preceding paragraph, the key-entrances are situated on different faces of the lock, for example, at opposite sides thereof, for the purpose of enhancing still further the proof of the lock against unauthorized opening by providing that to open the lock, both hands will be required to operate the keys.

The invention includes apparatus for use in locking transportable containers (for example, railway vans) comprising, in combination, a set of dissimilar keys, and a plurality of attachable locks (e. g. padlocks), each of which is constructed as set forth above and has its bolt-withdrawing mechanism arranged for co-operation with a combination of keys of said set allocated exclusively to it.

The invention also includes apparatus for use in locking transportable containers, for example railway vans, comprising, in combination, an attachable lock (e. g. a padlock) constructed as set forth above with removable tumblers which are so positioned in the lock as to be invisible from outside the lock, a set of dissimilar keys to be employed with the lock in selected combinations, and a set of interchangeable and dissimilar tumblers therefor for use selectively in the same lock according to the particular combination of keys of the set which are to be used to open the lock.

In the case of railway transport vehicles, the general system of locking may be one in which each of the various stations en route is supplied with a complete set of keys and there is provided for use with these keys as many padlocks as there are possible combinations and permutations of the keys, the several locks being adapted, as above, to be operated by the conjoint action of two particular keys of the set. The way-bill accompanying the loaded vehicles would contain an indication addressed to the person authorized to open the locks informing him which two keys are to be used and how these keys are to be used to open the lock.

As will be readily appreciated, the arrangement may be one in which not only have two particular keys of the set to be used to open the lock, but these particular keys must be used in a particular manner. For example, if the two keys have to be inserted from opposite sides of the lock, one of the keys would be made to operate only on one side of the lock, and the other key on the other side thereof, and the way-bill indication would state, not only which two keys are to be used to open the lock, but also which key of the two is to be used on one side of the lock, the other key, of course, being used on the other side thereof.

The accompanying drawing illustrates, by way of example, one form of padlock in accordance with the present invention.

In the drawing—

Figure 1 is an elevation of the padlock with a part of the padlock casing removed so as to show the bolt-mechanism,

Figure 2 is a longitudinal section through the padlock taken along the line 2—2 of Figure 1,

Figure 3 is a diagrammatic representation of a key for use with the lock, and

Figure 4 is a fragmentary horizontal section of a part of the lock taken through the line IV—IV of Figure 2.

Like reference characters indicate like parts in all figures of the drawing.

The lock comprises a rotatable hasp-disc 10 mounted within a lock-body 11. The disc 10 is rotatable from the open position shown in full-lines in Figure 1 to the closed position shown in chain-line, and as will be seen, the mouth 12 of the disc is closed by the horn 13 of the lock-body when the disc is in its chain-line position.

The hasp-disc 10 co-operates with a bolt 14, the nose of which is received in one or other

of the two recesses 15, 16 of the disc 10. In the open position of the disc, the nose of the bolt is received within the recess 16 and in the closed position it is received within the recess 15.

The bolt 14 is slidable radially of the disc 10 and is arranged to be withdrawn from the recess, 15 or 16, by means of a pair of key-operated levers or pressure members 17, 18, operatively connected to the bolt 14 through the medium of a yoke 19. The bolt is held in position with its nose in the recess 15 (16) by means of a pair of springs 116.

The yoke 19 is pivoted at 20 to the bolt 14 and it has lateral projections 21, 22, which are positioned respectively in the paths of movement of the extremities of the two levers 17, 18, so that when these levers are depressed, they engage the lateral projections 21, 22 of the yoke 19 and, through the said yoke, transmit thrust to the bolt 14, whereby the latter is withdrawn from the recess 15 (16) with which its nose co-operates. The arrangement is such that the bolt can be withdrawn thus from the recess 15 (16) only when both of the levers 17, 18, are depressed simultaneously. When one or other of the levers is depressed singly, it is inoperative upon the bolt, and simply pushes aside the yoke 19, turning the latter about its pivot 20.

The levers 17, 18, are mounted upon pivots 23, 24 and are operatively connected to levers 25, 26 by means of links 27, 28. Levers 25, 26 take the form of arms projecting radially from sleeves 29, 30. The sleeves 29, 30 are mounted upon a removable pin 31 in the base of the lock-body 11.

The pin 31 may be mounted in the base of the lock body in any desired manner. Conveniently, however, as shown in Figure 4, its ends may be received in recesses 311 provided in the side walls of the recess 160 to receive them. The pin in this arrangement is simply dropped into place or lifted out through the open front of the recess 160, the cover plate 161 having been previously removed. In order to retain the pin in position at the back of the recess 311, its ends are provided with spacing lugs 312 which are forged on the pin and extend radially therefrom along the recess 311 sufficiently far to be flush at the end with the face of the lock body and thereby to abut against the inner faces of the cover plate 161.

Said sleeves 29, 30 are movable independently of one another on said pin 31, and each carries an additional radial arm 32, 33, the nose of which is spring-pressed by a spring 34 towards and into engagement with the periphery of a rotatable key-hole tube 35 mounted in the base of the lock-body 11.

The key-hole tube 35 is provided with a slot 36 which normally registers with slots 37 in the edges of a series of stationary wards 38 secured in the base of the lock-body 11.

The wards 38 fit as usual the bits of the keys which are to be used to open the lock. The number of wards 38 provided in the lock depends upon the total number of keys which are to be used in combination with the lock. A lock in which for instance there are nine wards on each side can be used with any pair of keys selected from a set of twenty different keys. The levers 32, 33 on the sleeves 29, 30 are operated directly by the key-bits upon the keys having been rotated through approximately two right angles from the initial position they occupy when first inserted into the key-hole tube 35.

As will be appreciated, the position of the arms 32, 33 on the sleeves 29, 30 depends upon the particular pair of keys which are to be employed to open the lock, it being understood, of course, that the nose of said arm 32 (33) is so positioned on the sleeve 29 (30) as to register with the space between those two wards (38) which accommodate between them the bit of the particular key which is to be employed in opening the lock.

As will be appreciated, every key of the aforesaid set of twenty keys has allocated to it a tumbler; that is to say, a sleeve 29 (30) carrying lever arms 25 (26), 32 (33). There are, therefore, twenty tumblers from which to select a pair to be used in one and the same lock in combination, the various tumblers all being interchangeable and capable of being mounted within the lock upon the removable pin 31. These tumblers differ from one another only in the position along the length of the sleeve 30 (31) of the lever-arm 32 (33). The lever arm 29 (30) occupies the same position in all of the tumblers. This is because this particular arm is connected to the link 27 (28), which, of course, does not form part of the tumbler and remains in the lock when the interchange is effected of the tumblers of the lock. Any convenient form of connection permitting of ready interchange of the tumblers may be provided as between the arm 25 (26) of the tumblers and the link 27 (23). In the drawing a drop-nose pin is shown by way of example.

In the construction illustrated in the drawing and particularly described above, the arrangement is one in which a set of interchangeable tumblers corresponding to a co-operating set of keys are provided for use in one and the same lock. As previously indicated, however, the invention may take an alternative form in which there are as many locks as possible combinations of the keys in which event the tumblers of the lock would form a permanent part of the lock mechanism in contrast to being removable from the lock and interchangeable with other tumblers as in the arrangement above described. The general construction of the lock, however, could be the same, the only necessary difference being that in said alternative form of the invention, the tumblers as stated are permanently mounted in the lock.

Further, the lock may comprise more than one bolt, in which event, the bolt-withdrawing mechanism would be suitably modified as compared with the single-bolt arrangement described and illustrated, the general principle being adhered to that to open the lock (that is to say, for example, to release the hasp-disc 10) two or more keys would require to be used conjointly.

In order to enhance the security of the lock, the keys may be so constructed that it would be impossible to discover the right key simply by the feel of the key, and to be able to select the correct key, it would be necessary to know the combination number of the key. Moreover, the shape of the key (that is to say, the bit-portions of the keys) can be made as complicated as desired so as to make it exceedingly difficult to copy them. Also the variations in the shape and dimensions of the wards in the base of the lock can be so designed that it would be almost impossible for an unauthorized person to construct a universal key.

I claim:

1. A lock comprising in combination a bolt, a

yoke operatively connected to the bolt, pressure-members located so as to engage balancing pressure faces on the yoke, key receiving apertures to receive a plurality of keys simultaneously, tumblers to cooperate with each of said keys, and operative connections between each tumbler and one of the pressure-members for the purpose described.

2. A lock comprising in combination a bolt, a yoke operatively connected to the bolt, two pressure-members located so as to engage balancing pressure faces on the yoke, two key receiving apertures to receive two keys simultaneously, two tumblers to cooperate with each of said keys and operative connections between each tumbler and one of the pressure-members for the purpose described.

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