

PATENT SPECIFICATION

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(54) SAFES

(71) We, CRADO DEVICES LIMITED, a British Company of 3 Bluebell Wood, Billericay, Essex, CM12 0ES, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to safes.

The protection of valuable and semi-valuable items left by hotel guests in their rooms is becoming increasingly important. Hotels already provide safety deposits for property of high value. However, some articles such for example as sentimentally valued items, credit cards and cash are not normally lodged in the safety deposits because they are located away from guests' rooms and are time consuming and inconvenient to get to. The articles are thus often left in the hotel room while the guest is temporarily absent, and they are increasingly becoming the target of petty thieves who obtain duplicate room keys and, by experience, have learnt rapidly to search through guests' luggage and all likely hiding places within hotel rooms.

The provision of a safe in each room would provide a solution to the problem. However, because of the high turnover in room occupants, a conventional safe with a key lock is not suitable. To minimize risk, each safe would have to be provided with a unique key and the administration and secure control of these keys would place an unacceptable burden on the hotel management. Thus, for example, guests might depart with their keys, or thieves posing as guests might make a copy of their key for use at a later date.

The use of a safe with a conventional combination lock in each room also has unacceptable disadvantages. Thus, although the combination could be altered between each room occupancy, the administrative task of doing this would be too great. Also, the central recording of all individual room safe combinations in the hotel would be necessary in case a guest should forget his particular combination number, and this

would present an unacceptable security risk, especially to insurance companies.

It is an aim of the present invention to provide a safe having a locking mechanism which is designed to overcome the aforementioned problems.

Accordingly, the present invention provides a safe having first and second combination locking mechanisms which can each open the safe irrespective of the combination setting of the other combination locking mechanism.

It is envisaged that the first combination locking mechanism can be set in any desired combination by the hotel guest. In the event that the hotel guest should forget the particular combination that he has set, then the hotel management can open the safe by opening the second locking mechanism with a combination known only to the hotel management. The hotel guest can choose any combination at random and the hotel management can vary their combination as and when desired so that a high overall security level can be obtained with a low level of inconvenience to both hotel guests and hotel management.

Preferably, the first and second combination locking mechanism share common lock parts. The common lock parts may include a plurality of combination dials and a gate assembly for each dial, the gate assembly for each dial cooperating with a first release slide which is part of the first combination locking mechanism and with a second release slide which is part of the second combination locking mechanism.

Each gate assembly may comprise a drive device having a pair of recesses each defined by a ring of teeth, a toothed coding disc fitting in each recess, and a coding lock tab for fitting in a slot in each coding disc and for controlling relative movement between the coding discs and the drive device. Preferably, the safe includes a spring housed in a recess in each coding disc and operative to push the lock tabs against the teeth of the drive device for locking the coding discs to the drive device until such time as the lock tabs move radially inwardly in their

slots in the coding discs.

Advantageously, the release slides operate a bolt member. The release slides may each have a first tab for fitting in a recess in the bolt member, and a plurality of second tabs which are equal in number to the number of combination dials and which normally rest between the gate assemblies which are free to rotate.

10 In an alternative construction of safe in accordance with the invention, the first and second combination locking mechanisms are separate locking mechanisms which are separately operated.

15 Preferably, the safe includes a key-operated lock, the first combination locking mechanism being operable independently of the key-operated lock, and the second combination locking mechanism being operatively associated with the key-operated lock

20 whereby the key-operated lock must be released before the second combination locking mechanism can be operated to unlock the safe. When the safe is one having the

25 release slides, then the safe is preferably such that it is locked with the first combination locking mechanism set in a desired combination by rotating a safe handle one way, and is also such that it can be un-

30 locked by selecting the correct combination set in the first combination locking mechanisms and rotating the handle the other way to operate the first release slide, or by selecting the correct combination set

35 in the second combination locking mechanism and unlocking the key-operated lock to allow the handle to be rotated the said first way to operate the second release slide.

40 Access to the second combination locking mechanism is controlled by the key-operated lock. The hotel guests will thus not be able inadvertently to operate the second combination locking mechanism, and the second

45 combination locking mechanism will thus not readily be accessible to thieves. The key-operated lock may be replaced by other types of lock including combination locks if desired. The key-operated or other lock may be effective to secure in position a cover for the second combination locking

50 mechanism.

The combination-setting dials are advantageously set to letter combinations since key words which a guest is unlikely to forget can thus be formed. Obviously, if desired, number combinations or letter and number combinations can be employed. The letters and/or numbers can be provided on combination-setting dials on, for example, separate display portions. Advantageously, the outer surface of the dials is serrated or otherwise roughened to provide a surface which is easily gripped.

65 Preferably, the safe is one in which sufficient of the first combination locking

mechanism in its locked condition can be seen when the safe has been opened by the second combination locking mechanism in order to enable the first combination locking mechanism to be unlocked with the safe open.

The safes of the present invention can be constructed from the materials presently employed for making safes. The safes can be made in various sizes and it is to be appreciated that their use is not restricted to hotel rooms. Thus, the safes can be used in the home, in holiday homes, in hospitals and in ships. When the safes are to be used in hotel rooms, they will usually be relatively small so as not to occupy a disproportionate amount of space and, in any event, hotel guests do not usually have large amounts of valuables to store in their rooms.

75 The safes of the present invention are advantageously so constructed and designed as to fit in a corner of a room, for example a hotel room, whereby they can be secured to two walls of the room which are at right angles to each other. The safes can be secured to the walls by bolts or any other desired means.

80 Preferably, the safes are provided with sloping walls which slope away from the walls of a room when the safes are in position between two vertical walls of the room which are at right angles to each other. With such sloping safe walls, it is difficult to knock or prise the safes off the walls.

85 Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

90 Figure 1 is a perspective view of a safe in accordance with the invention;

95 Figure 2 is a front view of the first combination locking mechanism for the safe shown in Figure 1;

100 Figure 3 is a front view of the second combination locking mechanism for the safe shown in Figure 1;

105 Figure 4 is a perspective view of a face of a safe of the invention;

110 Figure 5 shows the inside face of the safe lid;

115 Figure 6 is a cross section of the locking mechanism sub-assembly along its centre line;

120 Figure 7 is a view on top of the locking mechanism with parts removed to the level 7-7 of Figure 6;

125 Figure 8 is a perspective exploded view of the parts comprising one of the gate assemblies within the lock mechanism;

130 Figure 9 is a plan view of a release slide within the lock mechanism;

135 Figure 10 is a perspective view of the cam within the lock mechanism used to release the bolt; and

140 Figure 11 is a perspective view of a safe

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Referring to the drawings, there is shown a safe 1 which has been fitted into a corner of a room by being bolted onto the shown 5 two walls A and B which are at right angles to one another. This position of the safe 1 provides maximum resistance to removal by prising or knocking off. In order to further increase resistance against attempts 10 to knock the safe 1 from its position, the safe 1 is provided with faces 2, 3, 4 and 5 which are angled away from the vertical walls A and B. Blows against the faces 2 and 3 will tend to bounce off, whereas 15 knocks on the faces 4 and 5 tend to push the safe 1 into either wall A or B, rather than away from the walls A and B.

The safe 1 is provided with a lid 6, hinged along one side 7 and secured in the locked 20 position by the bolt, operated by a knob 8. Sliding the knob 8 towards the face 4 locks the lid 6, and sliding the knob 8 in the opposite direction unlocks the lid 6. The knob 8 is shown in Figure 1 in the locked 25 position.

Movement of the bolt is controlled by a first combination lock mechanism which is assembled beneath the lid 6 and which contains four dials 9, 10, 11 and 12. Each dial 30 9, 10, 11, 12 contains a setting portion in the form of projecting thumb-disc 9A, 10A, 11A, 12A for enabling the respective discs 9, 10, 11, 12 easily to be rotated.

A metal strip 13 is slideably mounted on 35 the face of the lid 6 and contains four rectangular cut-outs, through which the projecting thumb-discs 9A, 10A, 11A, 12A protrude. With the strip 13 positioned as shown in Figure 1, a dial letter can be seen on the 40 right side of each thumb-disc 9A, 10A, 11A, 12A, each dial letter being viewed through a rectangular slot in the lid 6 itself. A lock 14 secures the strip 13 in the position shown in Figure 1.

Figure 2 shows the combination dials 9, 10, 11, 12 in more detail, the stem 15 of 45 the knob 8 being shown in the unlocked position. It can be seen that the strip 13 prevents the stem 15 from moving to the left as shown in Figure 2. Rotating the combination dials 9, 10, 11, 12 by means of 50 the thumb-discs 9A, 10A, 11A, 12A results in the letters changing in the rectangular slots in the lid 6.

With the knob in the unlocked position, 55 the combination dials 9, 10, 11, 12 are disconnected from the lock mechanism beneath the lid 6, and may be set to show letters in any desired combination. However, the moment the knob 8 is moved to 60 the right to lock the safe 1, the letter combination existing at the moment of movement is fixed into the first combination locking mechanism and cannot again be altered 65 until the box is unlocked once more, even

though the combination dials 9, 10, 11, 12 may be rotated into any position in the intervening time. The knob 8 cannot be moved to unlock the safe 1 unless the combination shown at the instant of locking is 70 once more reset.

In the drawings, each combination dial is provided with a complete alphabet of letters, 26 in all, giving 456976 possible combination settings. Since at any time only one 75 of these will permit the safe 1 to be unlocked, lock security is of a very high order. In Figure 2, the word CODE has been used to illustrate the correct combination setting.

In every day use, the safe 1 is left un- 80 locked and a hotel guest taking possession of the room can put his small valuables into it. Immediately before locking the safe 1, the guest can think of a suitable four letter code and can then simply turn the com- 85 bination dials 9, 10, 11, 12 until this is shown. The guest then locks the safe 1, and finally spins the combination dials 9, 10, 11, 12 to produce a random set of letters for view. The safe 1 cannot now be un- 90 locked by anyone other than the hotel management unless the correct chosen combination is reset.

Every safe 1 in the hotel thus will be individually coded by the guest who happens 95 to be occupying its respective room. The codes will be continuously varying and, at any one time, only each guest will have a knowledge of the code last set. Although this would be the ideal situation from the 100 point of view of security, it is unfortunately necessary to enable the management to open a safe at any time. This is because, for example, a guest might forget the combination he set, or he might depart from the 105 hotel leaving the safe 1 locked.

To provide the hotel management with a key lock to enable it to override the guest's lock would reduce the security of the installation unacceptably. If all safes in the 110 hotel had a single master key, the unauthorised removal of their contents would be possible to anyone who could obtain the master key, or make a copy of it. If all the hotel safes had individual management keys, 115 the problem of their control and security could be too great.

To overcome this, the safe 1 of the invention is provided with a second combination locking mechanism for use of the hotel 120 management. This second combination locking mechanism comprises a set of combination dials 16, 17, 18, 19 which can only be seen when strip 13 is slid to the left, as shown in Figure 3. To slide the strip 13 to the left, 125 the lock 14 must be unlocked. The lock 14 need not be of high security manufacture, and indeed can be standard for every safe 1 in the hotel. Its main purpose normally is to secure the strip 13 to prevent hotel 130

guests from seeing the second set of dials 16, 17, 18, 19 which would be confusing for them.

Having uncovered the second set of dials 16, 17, 18, 19 by sliding the strip 13 to the left, a code previously chosen by the hotel management can be set and the safe 1 unlocked. In Figure 3, the word OPEN has been used to illustrate the hotel management code. Should the hotel management wish to alter its own code, it is now able to do so, movement of the strip 13 to the left having freed the stem 15, and the knob 8 can now also be slid left, beyond its normal unlocked position. This frees the second set of dials 16, 17, 18, 19 from the lock mechanism enabling a new combination code to be chosen. Sliding the knob 8 back to its previous position now re-connects the management discs to the lock mechanism, fixing the newly set code. Finally, the strip 13 is returned to its original position and relocked in position by lock 14, thereby preventing inadvertent or unauthorised alteration to the hotel management setting.

Referring now to Figure 4, a safe is shown containing one set of four combination setting dials 20', 20'', 20''' and 20'''. The letters A to Z have been omitted from the face of these dials. However, these letters would be marked against the angle markings round the outer edge of each dial face.

An operating handle 21 contains a simple key lock 22 and a push button 23, shown in Figure 4 with its end flush with the top face of the handle 21. The handle 21, lock 22 and push button 23 co-operate with a lock mechanism 24 (Figure 5), which is a sub-assembly attached to the rear face of a safe lid 25 by screws 26.

The key of the lock 22 can, after insertion, be turned through 90° to release the push button 23, but the key can only be removed when it has been turned back to the "locked" position once more. With the button 23 in the position shown, the handle 21 can only be rotated 90° in a clockwise direction. When the lock 22 is unlocked, the button 23 is released, and being spring loaded it pops out until it is approximately 5mm proud of the handle upper surface. In this position the handle 21 can be turned 90° counter-clockwise. The lock 22 can be re-locked, and the key removed with the button 23 out. Thereafter, if the button 23 is pushed in it will latch back with its face flush with the top surface of handle 21.

Referring now to Figures 6 and 7, the lock mechanism contains a bolt 27, two release slides 28' and 28'', and four gate assemblies 29', 29'', 29''' and 29''''.

Figure 8 shows each gate assembly 29', 29'', 29''' and 29'''' to be composed of a drive device 30, two coding discs 31 and

32, two coding lock tabs 33 and 34, and two springs 35 and 36. The relative positions of these are shown in Figures 6 and 7 for one assembly only. However, in the drawing, the lower coding lock tab 34 cannot be seen because its corresponding coding disc is not lying in the appropriate position.

The drive device 30 comprises a stem 41 and a disc 42. Extending from each side of the disc 42, around its outer surface, are 75 rings 47 containing a number of internal, square shaped slots and teeth 43 and 44 respectively. The number of these slots 43 corresponds to the number of characters on the combination setting dials 20', 20'', 20''' and 20''', in this case twenty six. The slots 43 on each side of the disc 42 are exactly aligned with each other axially. The coding discs 31 and 32 each contain a slot 39, a counterbored area 40 and a similar number 85 of slots and teeth 45 and 46 respectively around their outer edge.

The items illustrated in Figure 8 are assembled onto the drive device 30 with their counterbored surfaces inwards, 90 and in each space so produced is trapped a coding lock tab 33 or 34 and a spring 35 or 36. Each coding lock tab has a tooth 48 and a bent tab 49. In the assembly, the springs 35 and 36 push 95 their respective coding lock tabs 33 and 34 against the internal teeth each side of the drive device 30 and, at the same time, the bent tab 49 on each coding lock tab 33, 34 rests within the slot 39 of its respective coding disc 31, 32. In this way the coding discs 31, 32 are locked within the drive device 30 and are unable to rotate relative to it. If however, either bent tab 49 is pushed 105 radially towards the centre of the drive device 30, the coding disc 31, 32 with which it co-operates is released from the drive device 30, which may be freely rotated with respect to the former.

The combination setting dials 20', 20'', 20''' and 20'''' are secured to each gate assembly 29', 29'', 29''' and 29'''' through holes in the safe lid 25 and by means of screws passing through each stem 41 centre hole. The combination setting dials are secured in position with their letters exactly aligned with the slots 43 on the drive device 30.

It can be seen that when the two coding lock tabs 33 and 34 on each assembly are sprung fully home, the slots 39 on each coding disc 31, 32 are held in a position relative to a letter on its associated dial. When any coding lock tab 33, 34 is pushed towards the stem 41 of the drive device 30, its associated coding disc 31, 32 is freed and 125 the position of its slot 39 may be altered to line up with a new dial letter.

Referring now to Figure 9, there is shown the release slide 28' or 28''. This release slide 28' or 28'' contains four longitudinal tabs 130

37', 37'', 37''' and 37''', and one transverse tab 38, all raised up in the same direction from the release slide face. The release slide also contains a roller 50 which has a case hardened peripheral surface. Release slides 28', 28'' are positioned each side of the gate assemblies, with their tabs facing inwards. These release slides 28', 28'' are able to move longitudinally within the lock mechanism and are guided by spacers 51, which also separate and secure lock mechanism covers 52 and 53.

It can be seen that the longitudinal tabs on the release slides 28', 28'' are normally resting in the spaces between the gate assemblies which are free to rotate. Should pressure in the direction of arrow A be applied to either release slide 28', 28'', it is prevented from moving far unless all the slots in its associated coding discs 31, 32 are aligned to permit the longitudinal tabs to enter them. In any other coding disc position, the release slide can do more than slide into whichever of the teeth 45 are opposite the tabs 37, a movement of approximately 1mm only. This small movement is sufficient to lock the coding discs 31, 32 in position without contacting their coding lock tabs 33, 34. The combination setting dials 20', 20'', 20''', 20'''' attached to each gate assembly 29', 29'', 29''', 29'''' are therefore locked in position. If however the combination setting dials 20', 20'', 20''', 20'''' have been rotated so that the slots 39 of the coding discs 31, 32 associated with either release slide 28', 28'' are all lined up with its tabs, pressure in the direction of arrow A will move that release slide into the slots 39. In so doing, the bent tabs 48, 49 on the coding locking tabs 33, 34 are contacted and moved radially towards the stems 41 of the drive devices 30, and each coding disc 31, 32 is released from the devices 30.

The coding discs 31, 32 are now held stationary by the tabs on the release slide but the drive device 30 can be turned by moving the combination setting dials 20', 20'', 20''', 20'''' on the outside of the safe lid 25. It is now possible to align another letter on each combination setting dial with each respective coding disc 31, 32 beneath, and these new relative settings become securely held when the release slide 28', 28'' is returned to its rest position once more. Indeed, they remain fixed when the combination setting dials are spun around on the outside of the safe lid 25.

Referring again to Figures 6 and 7, it can be seen that the transverse tabs 38 fit within a space 64 in the bolt 27, one from above and one from below. If either release slide 28', 28'' is moved in the direction of the arrow A it will take the bolt 27 with it. On release of the moving pressure the return springs 54 and 55 return both the bolt 27

and the release slide 28', 28'' which was moved, back to their next positions.

The handle 21 on the outside of the safe lid 25 is connected through a hole in the lid 25, by means of a stem 56 to two cams 57 and 58. The respective positions of these cams 57, 58 can be seen in Figure 10. Each cam 57, 58 contains a semi-detent 59, approximately 2mm deep, a lifting portion 60, rising approximately a further 8mm, followed by a length 61 at constant radius. Each of these is disposed around 90° of the cam periphery. The remaining 180° approximately consists of a lower constant radius edge 62. The two cams 57, 58 are fixed onto the stem 56, in anti-phase, and they are displaced longitudinally so that they line up respectively with the rollers 50 on each release slide 28', 28''.

It can be seen that, assuming the release slides 28', 28'' are free to move, rotation of the handle 21 clockwise will cause one release slide to move, while the other remains stationary. Alternatively, rotation of the handle 21 counter-clockwise will reverse these respective release slide movements.

To place each release slide 28', 28'' in a free-to-move condition, it is necessary to rotate the combination setting dials until the slots 39 on their appropriate coding discs 31, 32 are correctly aligned. Once the release slide has moved fully, following 90° movement of the handle 21, it has disconnected all the coding discs 32 or 33 from the drive devices 30, enabling a new combination code to be set up on the combination setting dials. This new combination is fixed into the mechanism when the handle 21, and hence the release slide, is return to its rest position. This handle rest position also corresponds to the locked position of the bolt 27, 90° handle movement in either direction corresponding to the unlocked position of this.

In order to ensure positive bolt movement into the locked position, a pin 65 is provided between the cams 57 and 58. This also dead locks the bolt 27 when the handle 21 is in the locked position.

It is clear that either of the two dial combinations can be altered when the bolt 27 is unlocked, the release slide 28', 28'' affected being dependant on whether the handle 21 has been turned clockwise or counter-clockwise. Also, the dial combinations suitable for each release slide are different. It is therefore possible for one combination to be used by a hotel customer, and the other by the hotel management.

In use, the hotel customer sees the safe in the condition shown in Figure 4. When the hotel customer receives the safe unlocked, he can select any dial combination he may wish, set this up, and then lock the safe by turning the handle 21 counter-

clockwise. The selected combination is now fixed in and the hotel customer may spin the dials to disrupt it. In this condition the safe can normally only be opened by re-selecting the customer's chosen combination, and the handle 21 can only be rotated clockwise to unlock.

Should the hotel management wish to open the safe, they may do so by selecting their own combination on the dials and unlocking the lock 22 to release the push button 23, thus enabling them to rotate the handle 21 counter-clockwise. This action moves the release slide not previously used by the customer.

Having unlocked the safe, it is possible for the hotel management to find and reset the customer's combination. To do this, the hotel management returns the handle 21 to the locked position, then by means of small windows 63', 63'', 63''', 63'''' (see Figure 5) on the inside face of the lock mechanism, the hotel management are able to see the customer's half of the gate disc assembly and turn each dial until the appropriate coding disc slot 39 is seen to appear. The hotel management can then turn the handle 21 clockwise to unlock the safe, and leave it free for use by a new customer.

Referring now to Figure 11, similar parts as in Figure 4 have been given the same reference numeral and their construction and operation will not again be given in order to avoid undue length of description. In Figure 11, the handle 21 is only permitted to turn clockwise unless the key is turned in the cylinder lock. This action frees the handle 21 to enable it to be turned counter-clockwise, following which the key may be returned to its central position and withdrawn. The handle rotation control automatically springs into position again when the handle 21 is returned to the central position. The remainder of the safe can be constructed and arranged to operate as described above in connection with Figures 5 to 10.

It is to be appreciated that the embodiments of the invention described above have been given by way of example only and that modifications may be effected. Thus, for example, the safe 1 can be constructed differently than is shown and can be floor or wall mounted and of box construction. Also, other applications are possible so that the safe 1 can be used, for example, in ships, hospitals and holiday homes. Numbers can be used instead of letters although letter combinations which can form a word should be easier to remember. Further, more or less than the four dials illustrated can be employed. Still, further, the first and second combination locking mechanisms can be entirely separate or they can share common parts, for example a common bolt and set

of tumblers as in the case of the safe 1 shown in Figure 1. With a common bolt and set of tumblers, the tumblers are set in the bolt withdrawal position by either set of dials.

WHAT WE CLAIM IS:

1. A safe having first and second combination locking mechanisms which can each open the safe irrespective of the combination setting of the other combination locking mechanism.
2. A safe according to claim 1 in which the first and second combination locking mechanisms share common lock parts.
3. A safe according to claim 2 in which the common lock parts include a plurality of combination dials and a gate assembly for each dial, the gate assembly for each dial cooperating with a first release slide which is part of the first combination locking mechanism and with a second release slide which is part of the second combination locking mechanism.
4. A safe according to claim 3 in which each gate assembly comprises a drive device having a pair of recesses each defined by a ring of teeth, a toothed coding disc fitting in each recess, and a coding lock tab fitting in a slot in each coding disc and for controlling relative movement between the coding discs and the drive device.
5. A safe according to claim 4 including a spring housed in a recess in each coding disc and operative to push the lock tabs against the teeth of the drive device for locking the coding discs to the drive device until such time as the lock tabs move radially inwardly in their slots in the coding discs.
6. A safe according to claim 3 or to claim 4 and any claim when appendent thereto in which the release slides operate a bolt member.
7. A safe according to claim 6 in which the release slides each have a first tab for fitting in a recess in the bolt member, and a plurality of second tabs which are equal in number to the number of combination dials and which normally rest between the gate assemblies which are free to rotate.
8. A safe according to claim 1 in which the first and second combination locking mechanisms are separate locking mechanisms.
9. A safe according to any one of the preceding claims including a key-operated lock, the first combination locking mechanism being operable independently of the key-operated lock, and the second combination locking mechanism being operatively associated with the key-operated lock whereby the key-operated lock must be released before the second combination locking



clockwise. The selected combination is now fixed in and the hotel customer may spin the dials to disrupt it. In this condition the safe can normally only be opened by re-selecting the customer's chosen combination, and the handle 21 can only be rotated clockwise to unlock.

Should the hotel management wish to open the safe, they may do so by selecting their own combination on the dials and unlocking the lock 22 to release the push button 23, thus enabling them to rotate the handle 21 counter-clockwise. This action moves the release slide not previously used by the customer.

Having unlocked the safe, it is possible for the hotel management to find and reset the customer's combination. To do this, the hotel management returns the handle 21 to the locked position, then by means of small windows 63', 63'', 63''', 63'''' (see Figure 5) on the inside face of the lock mechanism, the hotel management are able to see the customer's half of the gate disc assembly and turn each dial until the appropriate coding disc slot 39 is seen to appear. The hotel management can then turn the handle 21 clockwise to unlock the safe, and leave it free for use by a new customer.

Referring now to Figure 11, similar parts as in Figure 4 have been given the same reference numeral and their construction and operation will not again be given in order to avoid undue length of description. In Figure 11, the handle 21 is only permitted to turn clockwise unless the key is turned in the cylinder lock. This action frees the handle 21 to enable it to be turned counter-clockwise, following which the key may be returned to its central position and withdrawn. The handle rotation control automatically springs into position again when the handle 21 is returned to the central position. The remainder of the safe can be constructed and arranged to operate as described above in connection with Figures 5 to 10.

It is to be appreciated that the embodiments of the invention described above have been given by way of example only and that modifications may be effected. Thus, for example, the safe 1 can be constructed differently than is shown and can be floor or wall mounted and of box construction. Also, other applications are possible so that the safe 1 can be used, for example, in ships, hospitals and holiday homes. Numbers can be used instead of letters although letter combinations which can form a word should be easier to remember. Further, more or less than the four dials illustrated can be employed. Still, further, the first and second combination locking mechanisms can be entirely separate or they can share common parts, for example a common bolt and set

of tumblers as in the case of the safe 1 shown in Figure 1. With a common bolt and set of tumblers, the tumblers are set in the bolt withdrawal position by either set of dials.

WHAT WE CLAIM IS:

1. A safe having first and second combination locking mechanisms which can each open the safe irrespective of the combination setting of the other combination locking mechanism.

2. A safe according to claim 1 in which the first and second combination locking mechanisms share common lock parts.

3. A safe according to claim 2 in which the common lock parts include a plurality of combination dials and a gate assembly for each dial, the gate assembly for each dial cooperating with a first release slide which is part of the first combination locking mechanism and with a second release slide which is part of the second combination locking mechanism.

4. A safe according to claim 3 in which each gate assembly comprises a drive device having a pair of recesses each defined by a ring of teeth, a toothed coding disc fitting in each recess, and a coding lock tab for fitting in a slot in each coding disc and for controlling relative movement between the coding discs and the drive device.

5. A safe according to claim 4 including a spring housed in a recess in each coding disc and operative to push the lock tabs against the teeth of the drive device for locking the coding discs to the drive device until such time as the lock tabs move radially inwardly in their slots in the coding discs.

6. A safe according to claim 3 or to claim 4 and any claim when appendant thereto in which the release slides operate a bolt member.

7. A safe according to claim 6 in which the release slides each have a first tab for fitting in a recess in the bolt member, and a plurality of second tabs which are equal in number to the number of combination dials and which normally rest between the gate assemblies which are free to rotate.

8. A safe according to claim 1 in which the first and second combination locking mechanisms are separate locking mechanisms.

9. A safe according to any one of the preceding claims including a key-operated lock, the first combination locking mechanism being operable independently of the key-operated lock, and the second combination locking mechanism being operatively associated with the key-operated lock whereby the key-operated lock must be released before the second combination locking



mechanism can be operated to unlock the safe.

10. A safe according to claims 3 and 9 in which the safe is locked with the first combination locking mechanism set in a desired combination by rotating a safe handle one way, and in which the safe can be unlocked by selecting the correct combination set in the first combination locking mechanism and rotating the handle the other way to operate the first release slide, or by selecting the correct combination set in the second combination locking mechanism and unlocking the key-operated lock to allow the handle to be rotated the said first way to operate the second release slide.

11. A safe according to any one of the preceding claims in which the first and second combination locking mechanisms include combination setting dials which are set in letter combinations.

12. A safe according to any one of the preceding claims in which sufficient of the

first combination locking mechanism in its locked condition can be seen when the safe has been opened by the second combination locking mechanism in order to enable the first combination locking mechanism to be unlocked with the safe open.

13. A safe according to any one of the preceding claims which is provided with sloping walls which are adapted to slope away from the walls of a room when the safe is in position between two vertical walls of the room which are at right angles to each other.

14. A safe substantially as herein described with reference to the accompanying drawings.

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