This invention relates to bolt work for safes, and more particularly relates to bolt work suitable for association with the doors of fireproof safes, cabinets and similar structures.

Heretofore it has been customary to build the bolt work into the door and to avoid the time and labor required to assemble the parts of the bolt work separately on the door. A further object of this invention is to provide bolt work construction which permits the door itself to form a sealed enclosure in which the filling may be placed. Another object of this invention is to provide bolt work for a safe door which renders it possible for the door to be so constructed that the filling is contained in a sealed chamber therein. A further object of this invention is to provide bolt work for safe doors which is shielded from being damaged by dusting of the door filling or other deteriorating influences. A further object of this invention is to provide bolt work of simple and durable construction, and bolt work which may be applied to a safe door readily and easily. Other objects of this invention will be in part obvious and in part pointed out hereinafter.

In accordance with this invention, the bolt work construction is assembled as a separate and complete unit apart from the door and is thereafter attached to the rear of the door by simple means and connected with the combination operating spindle and the handle for operating the bolt work.

In order that a clearer understanding of this invention may be had, attention is directed to the accompanying drawings forming a part of this application and illustrating certain possible embodiments of the invention. In the drawings, Fig. 1 is a horizontal sectional view of a fragment of a safe, including the door having bolt work construction embodying this invention; Fig. 2 is a rear plan view of the bolt work unit; Fig. 3 is an end view of the same partly broken away and showing a portion of the door; Fig. 4 is an enlarged horizontal sectional view of a fragment of the door and bolt work; Fig. 5 is a sectional view of the same and is taken on the line 5-5 of Fig. 4; and Fig. 6 is a sectional view of a fragment of a safe of modified form and a fragment of bolt work embodying this invention associated with such door. Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring to the drawings, the safe comprises conventional side body walls 1 and 2 having jamb walls 3 and 4 defining the side jamb walls of the safe doorway. Obviously, the safe also has top and bottom walls which supply the top and bottom jamb walls of the doorway. The safe includes a door in the form of a sealed compartment and includes the front plate 5, rear plate 6 and edge plates, such as 7 and 8, at both sides and at the top and bottom. Sealed in the door is suitable filling material 9 which may be cast therein similar to the manner in which the filling is cast into the body walls of safes. Extending through the door is the combination lock spindle 10 which carries the usual combination knob 11. Also extending through the door is a sleeve 12 in which is rotatably disposed the spindle 13 for operating the bolt work. The usual handle 14 is attached to this spindle on the outside of the safe.

The bolt work comprises a separate unit which is preferably assembled complete before being attached to the door. This unit includes a suitable housing comprising a front plate 15, a rear plate 16, and edged plates 17 and 18 at the sides and the top and bottom to complete the housing. The combination lock 19 is mounted in this housing in a suitable manner so as to be engageable with the combination lock spindle 10 when the housing is applied to the rear face of the door. A pin 20 is rotatably secured in a perforation in the housing plate 15 and has a hub 21, larger than the perforation, outside of the housing. Within the housing is a plate 22 which has a slot 23 through which the pin 20 extends. This plate also has a slot 24 in which is disposed a pin 25.
which is secured to the housing plate 15. A cam plate 26 is secured to the pin 20, as by means of nut 27, and has a pin 28 which seats between two shoulders or projections 29 and 30 formed on the plate 22. One end of plate 22 is flanged, at as 31, and is positioned near the locking edge of the door. A bolt 32 is secured to this flange 31 of plate 22, so that by sliding the plate 22 the bolt 32 may be locked and unlocked.

Cam plate 26 has another pin 33 which is connected by a link 34 to a bolt 35 which is disposed at the top of the housing for movement into and out of locking position. In a similar manner other pins 36 and 37 on the cam plate 26 are connected by means of links 38 and 39 to bolts 40 and 41, positioned respectively at the hinge edge and bottom edge of the housing for movement with the cam plate 26 into and out of locking position. The combination lock mechanism in the housing 19 has associated with it the conventional locking dog 42 which abuts the sliding plate 22 and thus dominates not only the movement of this plate and the bolt 32 but also movement of the cam plate 26 and the movement of the bolts 35, 40 and 41.

It will be apparent from the above that the bolt work is thus assembled into a separate and complete unit which may be applied to the rear of the safe door conveniently and easily. For instance, this housing containing the bolt work may be secured to the rear wall 6 of the door by means of bolts 43. To permit access to the interior of the housing for this purpose, the rear plate 16 of the housing may be removed without disturbing the assembly of the bolt work. This rear plate may be secured to the housing by means of suitable screws 44.

If the door is of the type shown in Fig. 6, wherein a separate valve door 45 is secured to the rear of the main door 46 by means of bolts 47, these same bolts may be utilized to secure the bolt work unit to the door at the rear of the valve door 45. In this modification of the safe a side wall of the safe is shown at 48. The door has a front plate 49 and a rear plate 50 and contains sealed-in insulation 51.

The jamb walls of the safes to which the bolt work unit is applied are provided with suitable shoulders behind which the bolts engage. For instance, in the structure shown in Fig. 1 the safe is provided with a bolt recess 52, and in the modification shown in Fig. 6 the recess for the bolt is shown at 53.

The pin 20 of the bolt work is provided with a key or tooth 54 which is adapted to interlock in the corresponding recess 55 formed in the end of the spindle 13 to establish a connection between the operating handle 14 and the bolt work, so that the bolt work is operable in the usual manner from the exterior of the safe door. This connection requires no separate application of parts nor adjustments.

This invention permits the door to be built up without any bolt work, and in the form of a sealed compartment which protects the cast-in filling from atmospheric changes. The separate and completely assembled bolt work unit may be securely attached to the rear of this door readily and easily. When attached to the door, the combination lock and the bolt work are operable in the usual manner from the outside of the door. When it is desired to unlock the safe, the combination lock is first manipulated to place the locking dog 42 out of engagement with the plate 22. Then by merely turning the handle 14 the cam plate 26 is rotated, and by reason of the connections between this plate and the bolts 32, 35, 40 and 41, these bolts are simultaneously retracted and the safe unlocked. The safe is locked by rotating the handle 14 in the reverse direction, and, if desired, the combination lock is operated to cause the plate 22 to be dogged by the locking dog 42, so that the safe cannot be again unlocked until the combination lock has been properly adjusted.

In mounting the bolt work, the plate 15 may be secured to the door before the bolt work is mounted on this plate; instead of the bolt work being pre-assembled thereon. It will be noted that the bolt work is confined in a compartment which is entirely separate from the compartment in the door in which is the filling material. Thus the bolt work is protected from damage which might be caused by dusting of the door filling, or other deteriorating influences.

As many changes could be made in the above construction and as many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What we claim is:

1. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a housing and a bolt work assembly mounted therein, means for securing said housing, after the assembly of the bolt work therein, to a safe door, a spindle in said door, and said bolt work including a member extending through said housing and projecting into the end of said spindle to interlock with the same and operatively connect said spindle with the bolt work assembly in said housing.

2. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a hous-
ing and a bolt work assembly and combination lock mechanism mounted therein, means for securing said housing after the assembly of the bolt work and combination lock mechanism therein to the safe door, a spindle extending through said door but terminating short of said housing, and a member associated with said bolt work projecting through said housing and adapted to interlockably engage with said spindle to operatively connect the bolt work assembly therewith.

3. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a housing and a bolt work assembly and combination lock mechanism mounted therein, and means for securing said housing after the assembly of the bolt work and combination lock mechanism therein to the safe door, said door having a spindle for the bolt work and a spindle for the combination lock mechanism, and said bolt work and combination lock mechanism simultaneously operatively engaging said spindles when said housing is mounted on the safe door.

4. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a housing and a bolt work assembly mounted therein, and means for securing said housing, after the assembly of the bolt work therein, to a safe door, said bolt work including bolts projectable from the housing, and a rotatable cam plate connected to said bolts for operating the same, the safe door having a spindle engageable with said cam plate whereby said plate may be rotated to operate said bolts into and out of locking position.

5. In safe construction, a safe door, a housing separate from the safe door, bolt work enclosed in said housing, combination lock mechanism enclosed in said housing dominating the operation of said bolt work, and means for securing said housing, with the bolt work and combination lock mechanism therein, to said safe door, said bolt work including bolts projectable from the housing, a rotatable cam plate connected to said bolts for operating the same, a slidable plate, said plates being connected together for simultaneous movement, the safe door having a spindle connected to said cam plate whereby said cam plate may be rotated to operate said bolts into and out of locking position, said combination lock mechanism including a dog for said slidable plate, and the safe door having another spindle connected to said combination lock mechanism for operating said dog.

6. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a housing and a bolt work assembly mounted therein, said housing comprising a body portion of substantially the same dimensions as the inside face of said door and a removable cover for said body portion, and means for removably securing said body portion to the safe door, said bolt work assembly comprising operative elements projecting through said housing at the top, bottom, front and rear edges of said door.

7. In safe construction, a safe door, a structural unit distinctly separate from the safe door, said unit comprising a housing and a bolt work assembly mounted therein, and means for securing said housing after the assembly of the bolt work therein to the safe door, said door having a spindle for the bolt work and said bolt work simultaneously operatively engaging said spindle when said housing is mounted on the safe door.

This specification signed this 24 day of May, 1926.

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