A. M. COYLE.
LOCK FOR ELEVATOR DOORS.
(Application filed July 29, 1900.)

2 Sheets—Sheet 1.
To all whom it may concern:

Be it known that I, ANDREW M. COYLE, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Locks for Elevator-Doors, of which the following is a specification.

My invention relates to that class of locking means employed in connection with elevator-doors at elevator-landings and intended not only to fasten and release the doors, but also to control the operation of the elevator mechanism to prevent the same from moving the cage when the doors are not closed; and my invention consists in constructing the parts as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view illustrating the arrangement of the locking devices in connection with parts of an elevator apparatus. Fig. 2 is a sectional elevation of the locking devices. Fig. 3 is an outside view of the keeper-case. Fig. 4 is a face view of the keeper-case; Fig. 5, a detached view illustrating part of a cage and device for operating the contact-piece from the cage.

The latch A, as shown, is a slideable latch and is carried by the door of the elevator-landing and generally in a latch-case B, provided with a handle and means for moving the latch therefrom. As shown, there is a spindle 1, with a cross-arm 2 engaging a pendulum lever 3, which engages the latch and is held against the cross-arm by a spring 4, so that the latch is withdrawn by rocking the spindle in either direction. There is connected with the latch, so as to be moved therewith, by an electrical bridge C, which serves to connect electrically two electric terminals 5 5, carried by the opposing door-jamb, or by the other door-leaf if the door has two leaves, and so that as the door is closed an electric circuit is completed between the terminals and through the wire 6, leading to any suitable operating device V, which when shifted on the making of the circuit will permit the cage to be actuated by the elevator mechanism. Thus the device consists of an electromagnet drawing in one direction an armature carried in the opposite direction by a spring and having a lug entering notches in the rim of a disk 81 on the shaft carrying the pulley 32, around which passes the control-rod 32. The terminals are insulated from their support in the jamb (or what is equivalent, the keeper-casing D) and are so arranged in relation to the bridge, latch, and keeper that when the latch is wholly disengaged from the keeper the bridge will be out of engagement with the terminals, and, conversely, the latch will engage the keeper before the electric circuit is completed, so that the door must be locked before the elevator mechanism can be started, and the latter is prevented from operating if the latch is drawn back, even if not wholly disengaged from the keeper.

The bridge may be of any suitable construction and connected by any suitable means to be shifted as the latch is shifted. As shown, the bridge consists of two rods 7 7, projecting through the face-plate 8 of the latch-casing and through a bar 9, attached to the latch A. The pins slide in a guide-rib 10 and through insulating-sleeves 11 11 in said rib and in the face-plate and through a connecting-plate 12 and are insulated by washers 13 and a strip 14 of insulating material, and the plate 12 is also insulated by washers 15 from the rib 10, so that when the pins 7 7 make contact with the terminals the circuit is completed through said pins and the plate 12. Springs 16, surrounding the pins and bearing on the collars thereof and on the plate 12, serve to project the pins outward, but permit each to yield separately to pressure against the terminals 5 5. When, however, the latch moves outward, the pins will also be thrust outward by the springs.

The terminals may be of any suitable character, but as shown consist of metallic blocks secured by bolts 17 in an insulated block 18, secured in the keeper-casing. Nuts are provided on the inner ends of said bolts for connecting the conducting-wires thereto.

It is desirable to prevent the landing-doors from being unlocked until the elevator-cage is in proper position opposite one of the doors, and to this end I provide a detent H in the latch-casing and provide the keeper-casing with a contact-piece I for engaging and shift-
ing the detent, with an arm J connected with
the contact-piece and arranged to be moved
by the cage when the latter is in proper posi-
tion for the door to open. As shown, the de-
tent H is a two-armed lever, the long arm with
a shoulder for engaging the end of the lever
3 when the short arm makes contact with the
contact-piece I as the door is closed. The
contact-piece I projects through an opening
in the face-plate of the keeper-casing and is
connected with an arm J on a rack-shaft 20,
passing through the keeper-casing and carry-
ning outside the latter the arm J. A spring 21
thrusts the arm J and contact-piece outward,
and both are drawn inward as the elevato-
cage or a projection W thereof, Fig. 5, comes
in contact with the arm J as the cage de-
scends. It will be evident that the parts may
be mounted directly in casings formed by
parts of the doors or jambs and that they may
be constructed and arranged in various dif-
ferent ways without departing from the main
features of my invention.

As shown, the latch K is intended for a
swinging door, the sides of the head, as also
the sides of the ends of the parts 11 11 and I,
being likewise beveled, so that they will be
forced inward into their casings as the door
closes. I do not, however, limit myself to
the use of a latch of this particular construc-
tion.

Without limiting myself to the precise con-
struction and arrangement of parts shown, I
claim—

1. The combination with the latch-casing,
keeper-casing and the latch, of a bridge sup-
ported to slide in one of the casings, insulated
terminals supported in the other casing and
means whereby the bridge is withdrawn on
moving the latch and is carried from the ter-

minals before the latch escapes the keeper,

substantially as set forth.

2. The combination with the latch-casing,
keeper-casing and the latch, of a bridge sup-
ported to slide in one of the casings, insulated
terminals supported in the other casing, means
whereby the bridge is withdrawn on moving the latch and is carried from the ter-
minals before the latch escapes the keeper,

a detent for locking the latch in engaging po-

sition, an arm outside one of the casings, and
connections whereby to move the detent, sub-
stantially as set forth.

3. The combination with a latch-casing, of
a slidable latch, a bridge connected to slide
with the latch and projecting outside the cas-
ing for engaging electric terminals to com-
plete an electric circuit, a detent to prevent
the movement of the latch and bridge, a
keeper-casing supporting the electric termi-

nals and an arm outside the keeper-casing,
and connections whereby to shift the detent
by moving said arm, substantially as set forth.

5. The combination of a latch-casing, keeper-
casing, and latch and bridge carried by the
latch-casing, electric terminals carried by the
keeper-casing, of a detent for engaging the
latch carried by the latch-casing, and an arm
and detent actuating means carried by the
keeper-casing, substantially as set forth.

6. The combination with a latch and its cas-
ing and keeper, of a slidable bridge connect-
ed to be shifted on the moving of the latch,
a detent for retaining the latch, and means
for throwing the detent into position as the
latch engages the keeper, substantially as set
forth.

7. The combination with a latch and its cas-
ing and keeper, of a slidable bridge connect-
ed to be shifted on the moving of the latch,
a detent for retaining the latch, means for
throwing the detent into position as the latch
engages the keeper, and an arm and connec-
tions for shifting the detent, substantially as
set forth.

8. The combination with a latch and its cas-
ing and keeper, of a slidable bridge connect-
ed to be shifted on the moving of the latch,
a detent for retaining the latch, means for
throwing the detent into position as the latch
engages the keeper, and an arm and connec-
tions adjacent to the keeper for shifting the
detent, substantially as set forth.

9. The combination with a latch-casing,
latch and slidable bridge, of a detent for re-
taining the latch, a keeper-casing provided
with electric terminals for engaging the
bridge, a contact-piece for engaging the de-
tent, and an arm outside the keeper-casing
for operating the contact-piece, substantially
as set forth.

10. The combination of a latch-casing, a
slidable latch, a bridge consisting of electric-
ally-connected rods extending through the
latch-casing and connected to move with the
latch, substantially as set forth.

11. The combination of a latch-casing, a
slidable latch, a bridge consisting of electric-
ally-connected rods extending through the
latch-casing and connected to move with the
latch, a keeper-casing provided with insu-
lated terminals for engaging the bridge, sub-
stantially as set forth.

12. The combination of a latch-casing, a
slidable latch, a bridge consisting of electric-
ally-connected rods extending through the
latch-casing and connected to move with the
latch, a keeper-casing carrying terminals for engaging the
bridge and with a rock-shaft having an arm,
and a contact-piece for engaging the detent,
and a lever on the shaft outside the casing,
substantially as set forth.

13. The combination with the landing-doors
of an elevator, of latch-casings and connect-
ed latches, slidable bridges thereon, keeper-casings carrying insulated terminals arranged to engage the bridges, and to break said engagement before the latch escapes the keeper, and electrical connections between the terminals and the elevator-actuating mechanism, substantially as set forth.

14. The combination with the landing-doors of an elevator, of latch-casings, latches connected to slidable bridges thereon, keeper-casings carrying insulated terminals arranged to engage the bridges, and to break said engagement before the latch escapes the keeper, and electrical connections between the terminals and the elevator-actuating mechanism, detents for locking the latches, and levers connected to operate the detents and arranged in position to be shifted as the cage is brought opposite the landing-doors, substantially as set forth.

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

ANDREW M. COYLE.

Witnesses:
D. L. HOLBROOK,
W. A. MORSE.