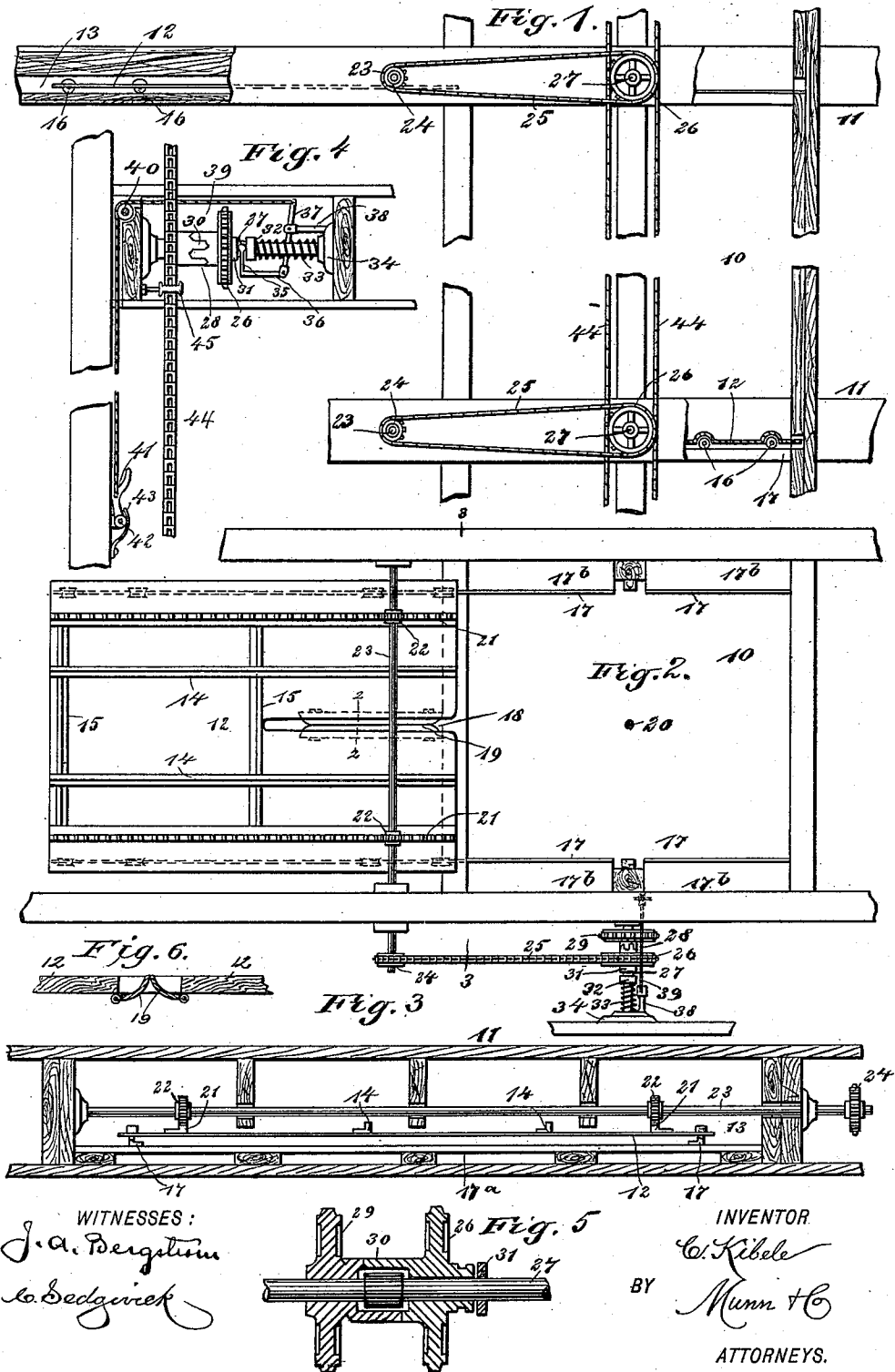


(No Model.)

C. KIBELE.
HATCH DOOR.

No. 486,341.

Patented Nov. 15, 1892.



UNITED STATES PATENT OFFICE.

CUNO KIBELE, OF BLUFFTON, INDIANA.

HATCH-DOOR.

SPECIFICATION forming part of Letters Patent No. 486,841, dated November 15, 1892

Application filed April 5, 1892. Serial No. 427,840. (No model.)

To all whom it may concern:

Be it known that I, CUNO KIBELE, of Bluffton, in the county of Wells and State of Indiana, have invented a new and Improved Hatch-Door, of which the following is a full, clear, and exact description.

My invention relates to improvements in sliding hatch-doors, which are adapted to close hatch-holes, elevator-wells, and similar door-openings; and the object of my invention is to produce an efficient and durable non-combustible door which may be arranged so as to close tightly any opening in a floor and to provide mechanism whereby the several doors in a building may be simultaneously closed or either one of them operated from any floor of the building, to the end that in case of fire the elevator-well or similar shaft may be closed, so as to prevent draft and consequent rapid spread of flames, and so, also, as to prevent the smoke from passing from floor to floor and filling the building and blinding and suffocating its occupants.

With these ends in view my invention consists in certain features of construction and combinations of the same, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation, partly in section, showing the application of the doors to the floors of a building and mechanism for operating the doors. Fig. 2 is a plan view of one of the doors and its operating mechanism. Fig. 3 is a cross-section on the line 3 3 in Fig. 2. Fig. 4 is an enlarged detail view of the clutch mechanism arranged at each floor. Fig. 5 is a longitudinal section of the clutch-pulleys and the clutch. Fig. 6 is a detail section on line 2 2, showing the construction of the cable-slot leaves or doors.

In the drawings, 10 represents an elevator-well or similar opening, and at the floors 11 of a building are sliding doors 12, which are adapted to entirely close the well, each door being held to slide in a recess 13 between the floor-timbers. The door 12 is preferably made of sheet metal and is stiffened by angle-irons 14 and 15, which are riveted to its top

and extend longitudinally and transversely across it.

The door is held to slide on rollers 16, which are grooved and held to run on tracks 17, these being mounted on supports 17^a between the floors, and the tracks are also continued across the well, being formed on plates 17^b, which are secured to the sides of the well, as shown in Fig. 2. The side edges of the door project beyond the tracks 17, so that when the door is closed it will close the well and will also close the slots adjacent to the side posts on which the elevator-car runs.

The inner edge of the door is slotted, as shown at 18, to provide for the movement of the hoisting-cable 20, and the slot is normally closed by freely swinging leaves 19, which are adapted to swing out of the path of the cable and which have their ends tapered, as shown in Fig. 2, so that the door may be readily pushed over the cable. The leaves or doors 19 are curved upward throughout their length and contact, along their longitudinal edges above their hinges or pivots, so that they cannot swing downward when said edges come in contact, but are free to swing upward, as will be readily understood by referring to Figs. 2 and 6. The leaves swing down by gravity. The leaves do not extend quite to the inner end of the slot 18. Consequently when the door is closed the cable may be held in the inner end of the slot and inside the leaves 19.

On the top of the door are parallel rack-bars 21, these being arranged near the side edges of the door and formed, preferably, on angle-irons, which are riveted to the door, and the rack-bars mesh with pinions 22, which are secured to a transverse shaft 23, journaled in suitable bearings and extending across the top of the door. On the outer end of the shaft 23 is a sprocket-wheel 24, which is driven by a chain 25, connecting with a sprocket-wheel 26 on a shaft 27, which is journaled in suitable bearings at one side of the elevator-well. The sprocket-wheel 26 turns loosely on the shaft 27 and is connected by a clutch 28 with a sprocket-wheel 29, which is also loose on the shaft. The clutch 28 consists of interlocking arms 30, formed on the hubs of the sprocket-wheels 26 and 29; but any suitable clutch may be employed. A loose collar 31 is mounted on the shaft 27 at one side of the sprocket-

wheel 26, and a fixed collar 32 is arranged parallel therewith and is pressed by a spring 33, which is coiled around the shaft 27 between the collar 32 and the bearing 34, as best
 5 shown in Fig. 4, and the pressure of the spring normally pushes the sprocket-wheel 26 so as to cause the arms 30 to interlock and the wheels 26 and 29 to turn together. A fork 35, formed on a rod 36 in the usual manner,
 10 enters between the collars 31 and 32, and the free end of the rod 36 is pivoted to a lever 37, which is centrally pivoted in a hanger 38, extending parallel with the shaft 27, and one end of the lever is secured to a cord or cable
 15 39, which extends over suitable guide-pulleys 40, and extends also up and down at one side of the elevator-well. The cord or cable 39 connects with a lever 41, which is fulcrumed at one end, as shown at 42, and is pressed into
 20 a vertical position by a spring 43. By throwing down the lever against the pressure of the spring the cord or cable is pulled, the lever 37 is tilted and the sprocket-wheel 26 thrown out of gear, so that it is not driven by the
 25 movement of the sprocket-wheel 29. This arrangement—that is, the clutch mechanism and the door-operating mechanism—is arranged at each floor of a building. An endless chain 44 extends vertically through the building
 30 and engages the sprocket-wheels 29, the chain being held against the wheels by guides 45, as shown in Fig. 4. It will be seen then that to close all the doors of the building it is only
 35 necessary to pull downward on one side of the chain 44, as this will revolve the sprocket-wheels 29 and 26, and the motion will be transmitted to the shaft 23, which, by revolving, will cause the pinions 22 to drive the rack-bars 21 and close the doors. To open the doors, the op-

posite side of the chain is pulled down. If but 40 one door is to be closed, the wheels 26 of the other bars are thrown out of gear by means of the lever-and-clutch mechanism described above.

Having thus described my invention, I 45 claim as new and desire to secure by Letters Patent—

1. The combination, with the slidable doors, each having parallel racks on its upper side and a cable-slot and each door provided along 50 the slot edges with hinged leaves having both ends curved or beveled to facilitate the entrance of the cable, of a series of shafts 23, one shaft crossing the upper side of each of the several doors and having pinions meshing 55 into said racks, sprocket-wheels 24 on the ends of the shafts, a shaft 27 at each floor, parallel with shafts 23 and having a slidable sprocket-wheel 26, operating mechanism therefor at each floor, sprocket-wheels 29 also on 60 the several shafts 27 and connected with the sprocket-wheels 26 by clutches, and a sprocket-chain 44, connecting the several sprocket-wheels 29 and held thereto by guides 45, substantially as set forth. 55

2. A hatch-door having a cable-slot and provided along the edges of the slot with hinged upward-swinging leaves, said leaves being curved or inclined upward at their inner edges and contacting above their hinges or pivots, 70 whereby they are free to swing upward, but are limited in their downward movement, substantially as set forth.

CUNO KIBELE.

Witnesses:

ADALGO WANDEL,
 W. T. T. SUAİM.