Dec. 5, 1961 C. L. EADS 3,011,330

LOCK CYLINDER CO-ORDINATOR

Filed May 31, 1960

Fig. 1.

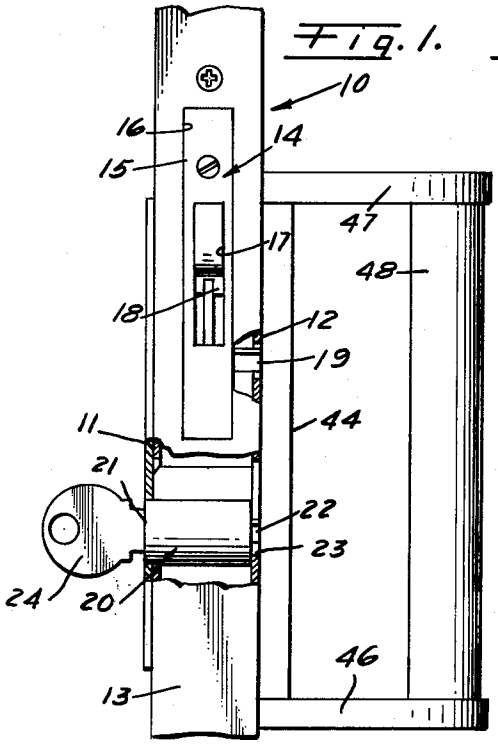
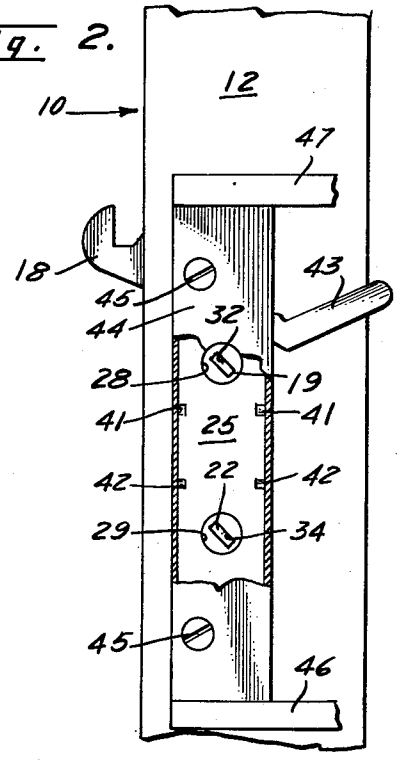


Fig. 2.



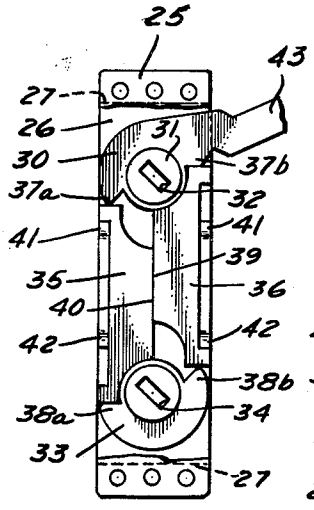


Fig. 3.

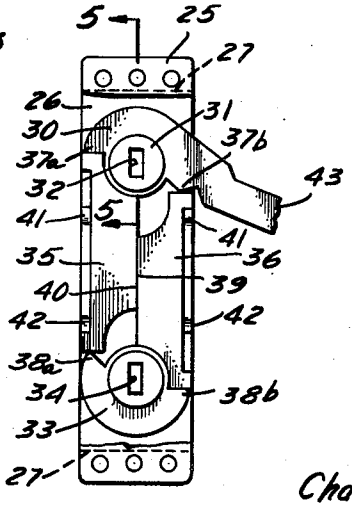


Fig. 4.

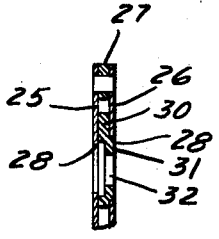


Fig. 5.

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LOCK CYLINDER CO-ORDINATOR

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1 Claim. (Cl. 70—100)

The present invention relates generally to lock mechanisms such as utilized in sliding doors, and the like; and is more particularly concerned with means for co-ordinating actuation of the lock mechanism from two spaced apart points or locations.

Heretofore, the conventional utilization of hollow extruded door frame structures of aluminum or other suitable metallic material in which the frame side walls are closely spaced, has presented a perplexing problem due to the restricted and limited mounting space within which the lock mechanism and key cylinder mechanism may be mounted.

This problem is greatly magnified in the case of installations employing by-passing door arrangements, and wherein it is desired to provide a key locking cylinder within the limits of the extruded frame structure. The conventional frames are so restricted as to space between the side walls that it becomes impossible to mount the lock mechanism and key cylinder in proximate side-by-side relationship for the purpose of obtaining two points of operation, one of which is accessible from the forward side of the frame structure, while the other is accessible from the rear side of the frame structure.

With the foregoing in mind, the herein described invention has for one object the provision of a lock cylinder co-ordinator which will enable two point operation, and wherein the key cylinder unit may be vertically positioned in spaced relation to the lock mechanism so as to permit mounting of the key cylinder within the limited space of the door frame.

It is one object of the herein described invention to provide a lock cylinder co-ordinator of such construction as to permit mounting of the key cylinder within the limited confines of the door frame.

A further object is to provide a lock cylinder co-ordinator of unitary construction which may be mounted on an exterior surface of the door frame to change a lock having a single point of operation into a lock mechanism having two points of operations.

Another object resides in the provision of improved lock actuating means which enables a key cylinder on by-passing doors to be mounted in semi-flush position within the limits of the frame member.

It is also an object to provide a novel motion transmitting mechanism of simple construction for use in connection with lock mechanisms, which may be economically fabricated as a separate article of manufacture.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is an enlarged edge elevational view of a sliding door frame having the lock cylinder co-ordinator of the present invention mounted thereon, portions being cut away to disclose structural details;

FIG. 2 is a side elevational view of the door frame showing the lock cylinder unit applied thereto;

FIG. 3 is an enlarged view of the co-ordinating unit, portions of the case being cut away to show the details of the motion transmitting parts and their cooperative relationship in the locking position of the lock;

FIG. 4 is a similar view showing the cooperative relationship of the parts in the unlocked position of the lock; and

FIG. 5 is a sectional view showing the manner of mounting the cam plates, taken substantially on line 5—5 of FIG. 4.

Referring more specifically to the drawings, the lock cylinder co-ordinator of the present invention is illustrated in FIG. 1 as being applied to a door frame **10** of aluminum or other suitable metal of tubular construction, which is fabricated or otherwise formed with spaced side walls **11** and **12** interconnected by a common edge wall **13**.

Mounted within the door frame **10** is a locking mechanism unit **14** which may constitute any one of a number of commercially available units. For illustrative purposes, the unit in the present instance is disclosed as being contained within a casing **15** adapted to be mounted within an opening **16** formed in the edge wall **13** of the door frame. The casing **15** containing the parts of the lock mechanism has an edge opening **17** through which a locking member **18** is movable to an extended locking position, as shown in FIG. 2, and a retracted unlocked position within the casing **15**. Movement of the locking member is effected by means of a rotatable actuating member **19** which extends through an opening in the wall **12** so as to be accessible from this side of the door frame and provide one point of operation. If it is desired only to operate the lock mechanism from one operating point, the actuating member **19** may be fitted with a conventional knob or handle.

From a consideration of FIG. 1, it will be apparent that with a locking mechanism unit such as illustrated therein, it would not be possible to mount a key actuated cylinder in side-by-side relation to the locking unit due to the restricted space in the door frame between the side walls **11** and **12**.

It is a feature of the present invention that its utilization permits the mounting of the key cylinder, as indicated by the numeral **20** in a position which is vertically spaced from the unit **14**, and in which position the full space between the side walls **11** and **12** is available for the mounting of the key cylinder. The key cylinder is mounted with one end, namely an end **21** in a semi-flush position with respect to the side wall **11**, while a rotatable actuating member **22** of the key cylinder mechanism projects through an opening **23** in the side wall **12**. As thus arranged, the key cylinder mechanism may be actuated from the inside of the door frame by means of a suitable key **24**, thus providing a second operating point. It will be appreciated that the semi-flush mounting of the end **21** of the key cylinder is an especially desirable feature in the case of by-passing sliding door arrangements.

According to the broad concepts of the present invention, the invention comprises motion transmitting means whereby the rotary motion of the actuating member **19** and the rotatable actuating member **22** may be co-ordinated for simultaneous rotation in the same directions. Obviously, various arrangements of elements may be used for this purpose. In the main, however, it is very desirable that the associated elements shall occupy as small space as possible depthwise.

More specifically, as illustrated in FIGS. 3 and 4, the co-ordinating unit of the present invention is shown as having its parts mounted between elongate substantially rectangular plate members **25** and **26** which are retained in spaced apart relation by means of end spacers **27—27**. The plate members **25** and **26** adjacent each end are provided with axially aligned openings **28—28**, and **29—29**.

A cam plate **30** is supported between the plates **25**

and 26 for rotation about the axis of the openings 28—28, the cam plate having an upset central hub portion 31 which extends into one of the openings 28. This upset hub portion is provided with a rectangular opening 32 which is adapted to receive a rectangular end portion formed on the adjacent end of the actuating member 19.

At the opposite end of the unit, there is provided a similar cam plate 33 mounted in the same manner as just described above for the cam plate 30, for rotation about the axis of openings 29—29. This cam plate has a rectangular opening 34 for receiving a rectangular end portion formed on the rotatable actuating member 22.

For co-ordinating the movement of the cam plates 30 and 33, a connecting linkage is provided, this linkage having parts so constituted that simultaneous rotation of the cam plates in the same direction will take place when either of the cam plates is rotated. More specifically, the linkage in this instance comprises a pair of elongate flat push links 35 and 36 which are mounted for reciprocable movement in the space between the two cam plates. The adjacent ends of the links 35 and 36 at the cam plate 30 are arranged to engage diametrically opposite points 37*a* and 37*b* of the cam plate 30, while the other ends of the links similarly engage diametrically opposite points 38*a* and 38*b* of the cam plate 33.

The push links 35 and 36 are mounted with their inner adjacent edges 39 and 40 in sliding engagement, and are further constrained against lateral separation by deflected finger portions 41 and 42 at the edges of the plate members 25 and 26. These finger portions further serve as stop members for limiting the reciprocable movement of the push links, and as a consequence the rotational movement of the cam plates 30 and 33.

Various arrangements of knobs, levers, etc. may be used to manually rotate the cam plate 30 to actuate the locking mechanism unit. In the present instance, the cam plate 30 is shown as having an integrally formed handle or lever 43 which extends laterally of the confines of the plate members 25 and 26, as best shown in FIG. 2. One feature of the link structure between the cam plates 30 and 33 resides in the fact that the push links 35 and 36 are subjected only to compressive forces, and provide simple means for accomplishing the purpose,

without the necessity of providing complex fastening means for connecting the push links with the cam plates.

As shown in FIGS. 1 and 2, the co-ordinating unit of the present invention may be mounted in a very small space and is easily concealed by a cover 44 which may be secured in position as by retaining screws 45—45. Moreover, due to the compact size of the co-ordinating unit, this unit may be mounted between the brackets 46—47 which support a door sliding handle 48. Thus, the lock actuating mechanism, on this side of the door, is in a conveniently accessible position, while the key cylinder in its semi-flush position is readily accessible for key control on the opposite side of the door.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claim.

I claim:

A lock cylinder adapter mechanism for a sliding door lock having a rotatable actuator, said mechanism comprising: an elongate support structure; spaced apart cam members rotatably supported on said structure for rotation about parallel axes of rotation, and each having a pair of camming arms positioned substantially on opposite sides of its axis of rotation, one of said members being adapted for connection with said actuator, and the other of said members being adapted for connection with said lock cylinder; and a pair of parallel reciprocably mounted push links extending between said cam members, one of said links having its ends respectively engaged by the camming arms of the cam members lying on one side of their axes of rotation, and the other of said links having its ends similarly engaged by the other camming arms of the cam members.

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