July 29, 1947. J. J. KORN 2,424,620

SKIP

Filed Feb. 11, 1946 3 Sheets-Sheet 1

Fig. 1.

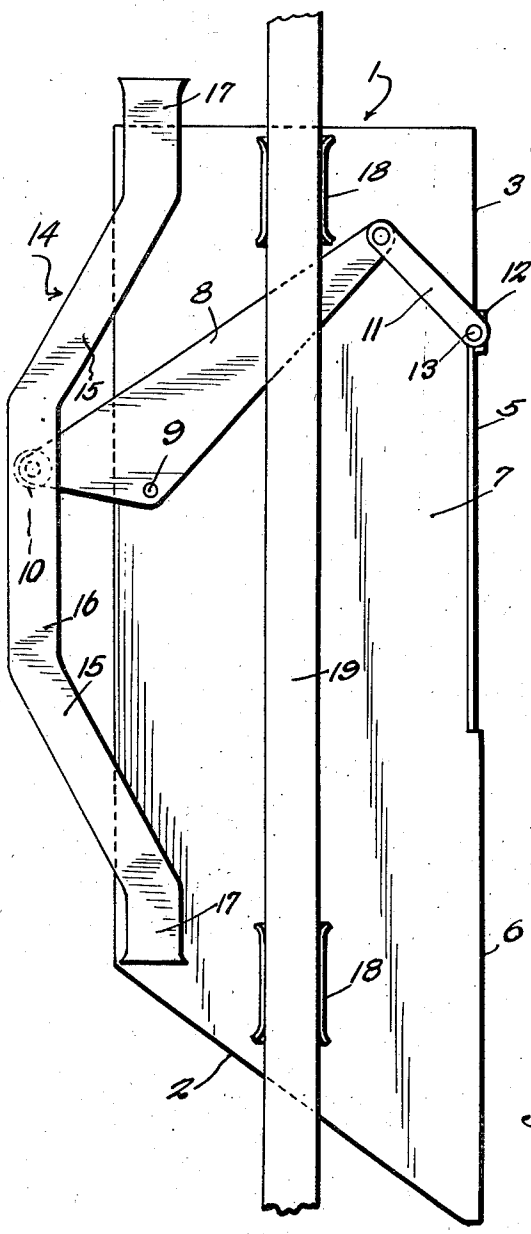
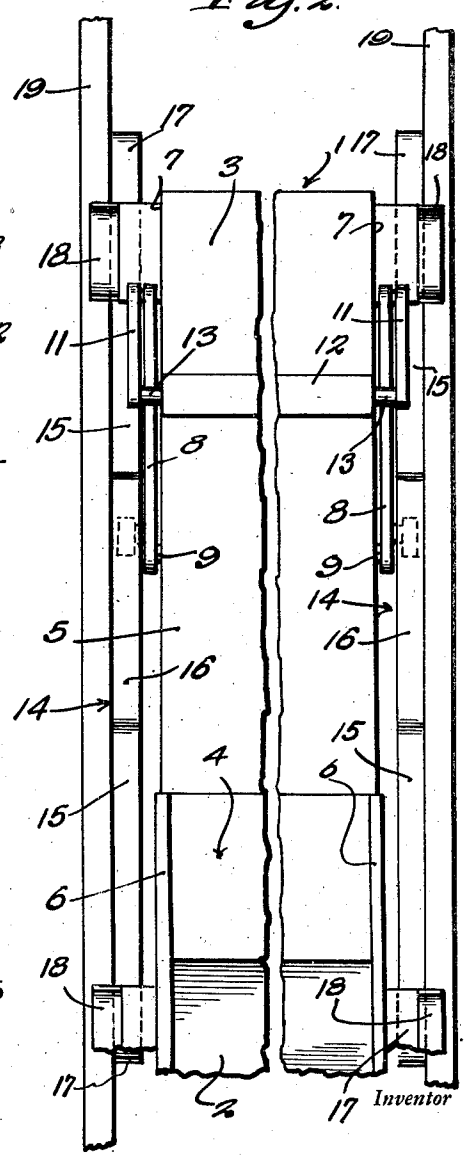


Fig. 2.



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July 29, 1947. J. J. KORN 2,424,620

SKIP

Filed Feb. 11, 1946 3 Sheets-Sheet 2

Fig. 3.

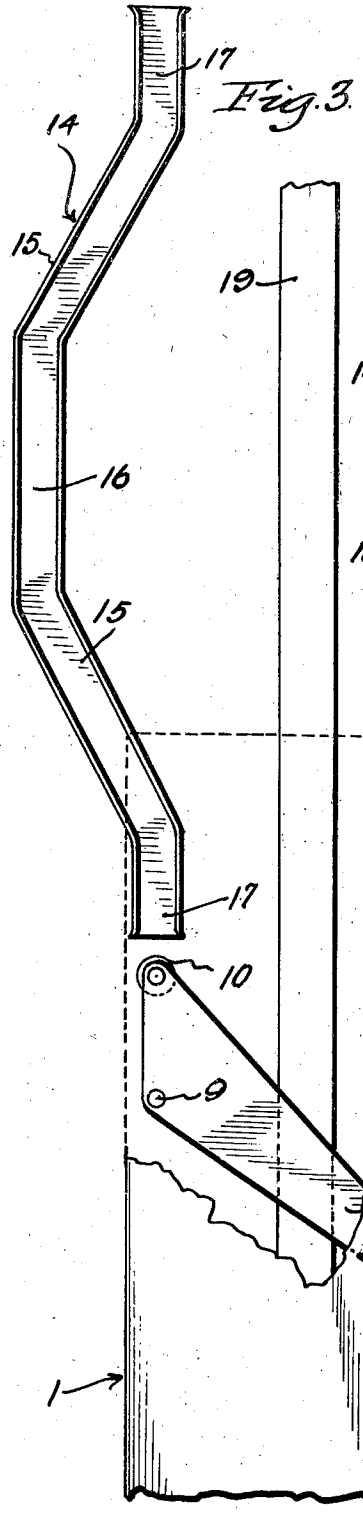
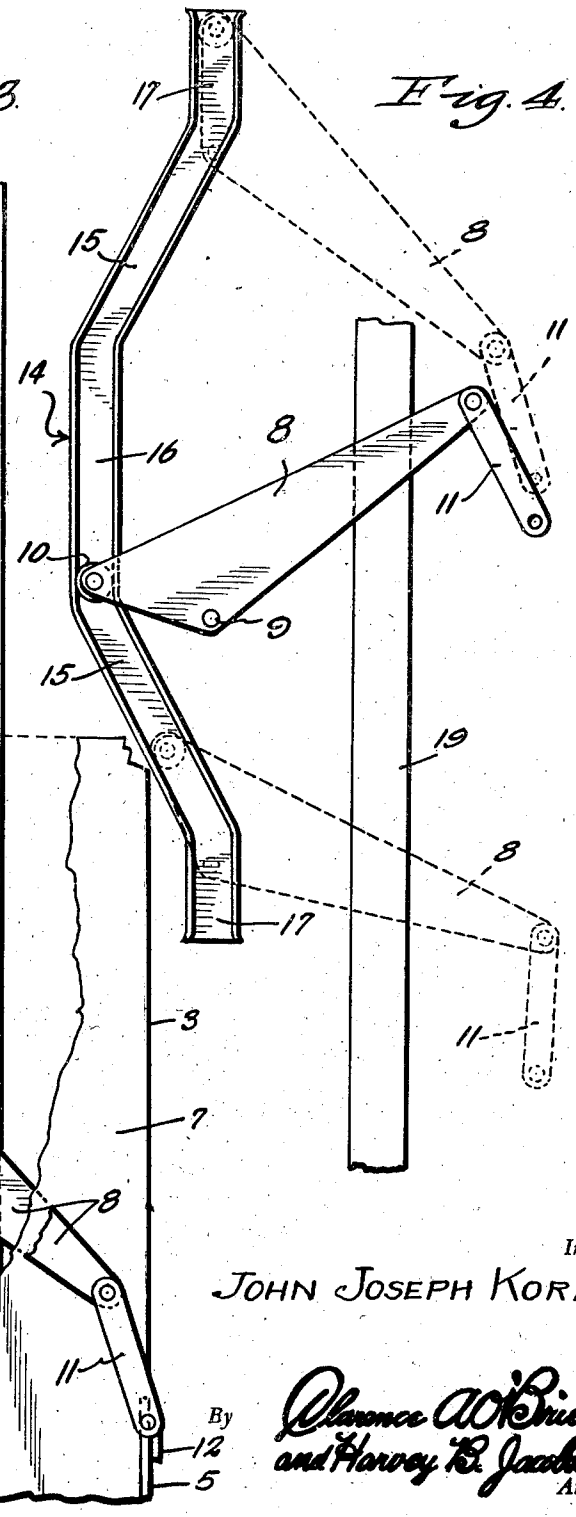


Fig. 4.



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July 29, 1947. J. J. KORN 2,424,620

SKIP

Filed Feb. 11, 1946 3 Sheets-Sheet 3

Fig. 5.

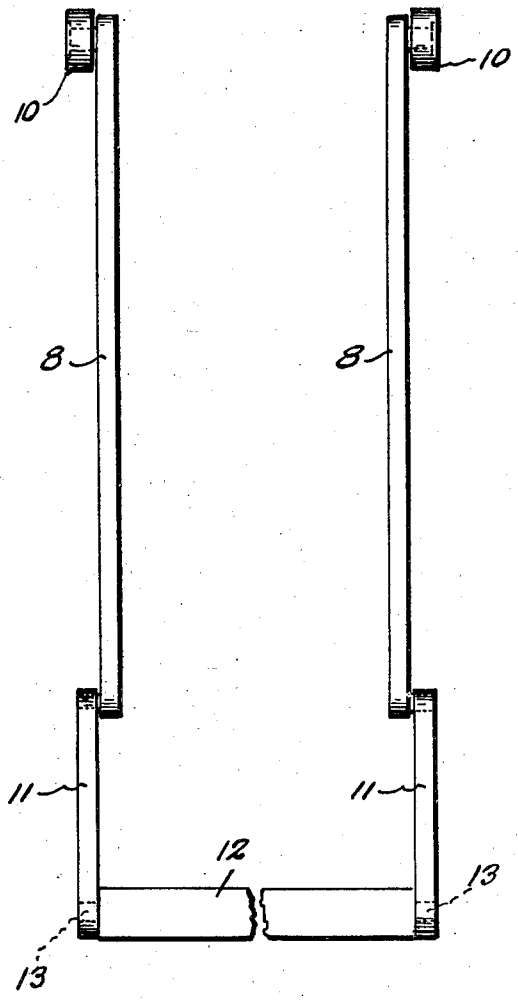
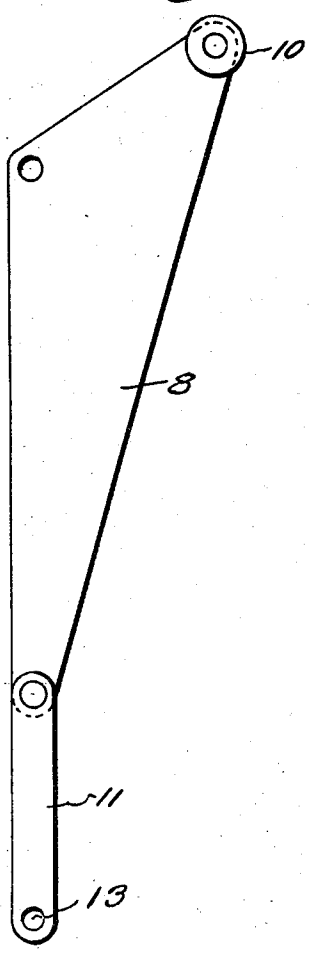


Fig. 6



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2,424,620

UNITED STATES PATENT OFFICE

2,424,620

SKIP

John Joseph Korn, Butte, Mont.

Application February 11, 1946, Serial No. 646,826

1 Claim. (Cl. 214—119)

1

The present invention relates to new and useful improvements in skips for operation particularly in mine shafts, although it will be understood, of course, that the device may be used for any other purpose for which it may be found adapted.

The primary object of the invention is to provide, in a manner as hereinafter set forth, an apparatus of the character described comprising a novel construction, combination and arrangement for automatically opening and closing the door of the skip at any desired level.

Other objects of the invention are to provide an automatic door operating means of the character set forth which will be comparatively simple in construction, strong, durable, highly efficient and reliable in operation, compact, and which may be produced at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation of an apparatus constructed in accordance with the present invention, showing the door in raised or open position.

Figure 2 is a view in front elevation thereof.

Figure 3 is a side elevational view with portions of the skip broken away, showing the door in lowered or closed position.

Figure 4 is a side elevational view of the apparatus with the skip omitted, illustrating the operation of the door-actuating elements.

Figure 5 is a view in front elevation of the door-operating members.

Figure 6 is a view in side elevation of the door-operating members.

Referring now to the drawing in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a skip 1 of suitable dimensions and material. The skip 1 includes a bottom 2 which is inclined toward the front of said skip. The front 3 of the skip 1 has formed in its lower portion an opening 4. A vertically slidable door 5 controls the opening 4. The door 5 is slidable in vertical guides 6 which are provided therefor on the sides 7 of the skip 1.

Substantially triangular levers 8, in the form of metallic plates, are pivotally secured at 9 on the sides 7 of the skip 1. Rollers 10 are journaled on one end portion of the levers 8. Links 11 are pivotally connected to the other end portions

2

of the levers 8. Fixed transversely on the upper end portion of the vertically slidable door 5 is a bar 12. Trunnions or pins 13 project from the ends of the bar 12 and journaled thereon are the links 11. Thus, the levers 8 are operatively connected to the door 5.

Angular tracks 14 of channel iron are mounted on suitable supports in the mine shaft, between which tracks the skip 1 is adapted to pass. The tracks 14, which receive the rollers 10, each includes oppositely inclined portions 15 and a vertical intermediate portion 16. The tracks 14 further include vertical end portions 17 for the entrance and exit of the rollers 10. This is illustrated to advantage in Figure 3 of the drawing.

It is thought that the operation of the apparatus will be readily apparent from a consideration of the foregoing. Briefly, with the door 5 of the skip 1 in lowered or closed position, the members 8 and 11 are as seen in Figure 3 of the drawing. Thus, the rollers 10 are in vertical alignment with the end portions 17 of the tracks 14. When the skip 1 is raised, the rollers 10 enter the lowermost portions 17 of the tracks 14 and are directed by the adjacent inclined portions 15 into the vertical intermediate portions 16 of said tracks. In this manner, the levers 8 are swung upwardly on their pivots 9 for elevating the door 5 to raised or open position through the medium of the links 11. If the skip 1 continues to move upwardly, the rollers 10 enter the uppermost inclined portions 15 of the tracks 14 and the foregoing operation is reversed for again closing or lowering the door 5. Of course, the same operation, in reverse, takes place when the skip 1 reaches the tracks 14 if said skip is descending. The skip 1 is provided, on its sides 7, with shoes 18 which travel on vertical guide rails 19 in the mine shaft.

It is believed that the many advantages of an apparatus constructed in accordance with the present invention will be readily understood, and although a preferred embodiment is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

In a skip including a front having a discharge opening in its lower portion, guides on the skip, a vertically sliding door for the discharge opening operable in said guides, a bar fixed transversely on the door, trunnions on the ends of said bar, a pair of stationary, angular channel

tracks for the passage of the skip therebetween, said tracks comprising oppositely inclined upper and lower portions and vertical intermediate portions, substantially triangular levers pivotally mounted for vertical swinging movement on the skip, rollers on one end portion of the levers engageable and operable in the tracks for actuating said levers, and links journaled on the trunnions and having one end portion pivotally connected to the other end portions of the levers for operatively connecting said levers to the door for raising and lowering same.

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