J. McCULLOCH.

Dumping-Cage for Elevators.

No. 160,112. Patented Feb. 23, 1875.

Fig: 1

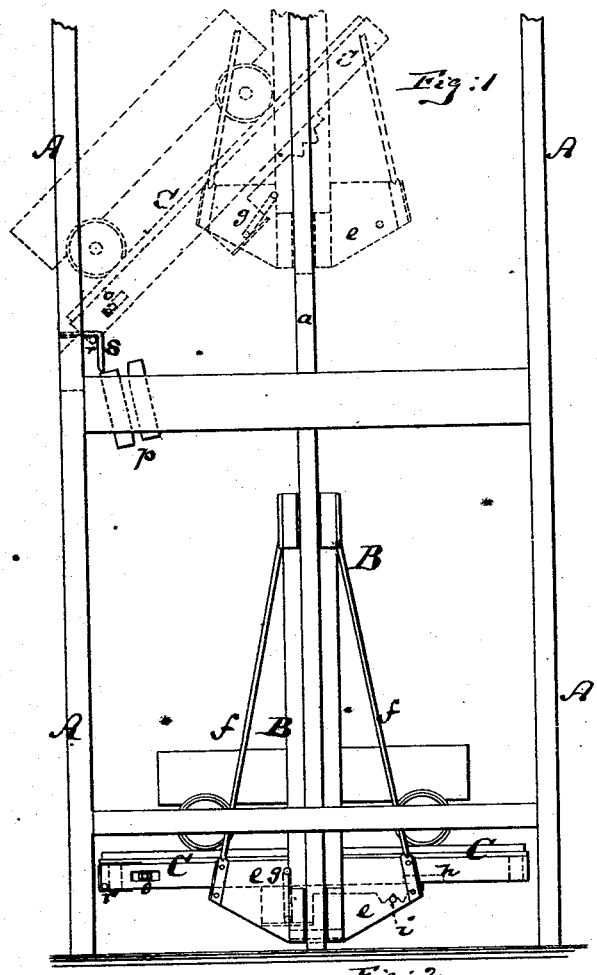

Fig: 3

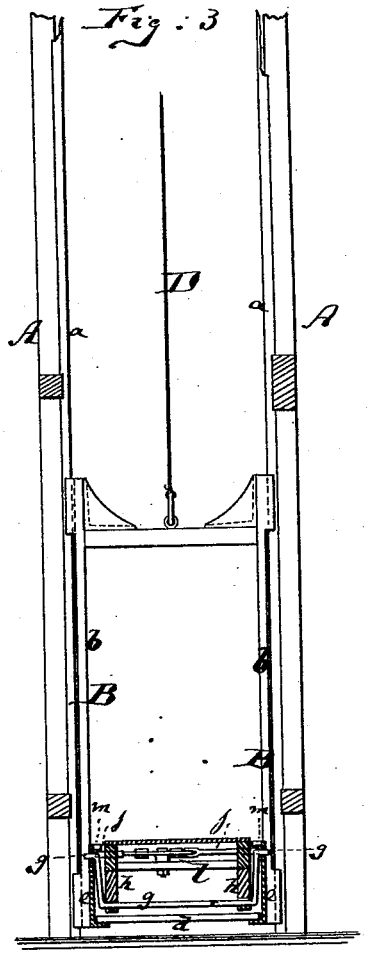

Fig: 2

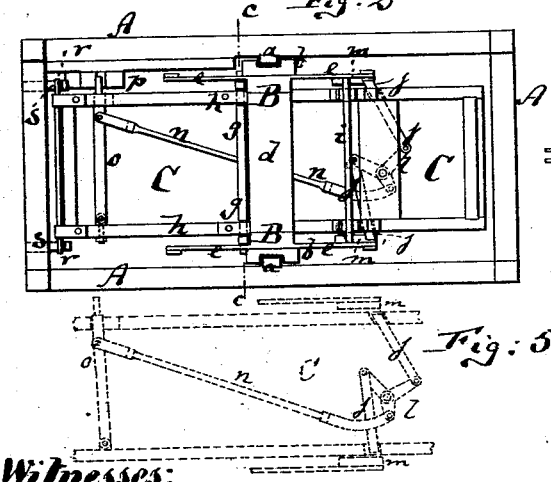

Fig: 4

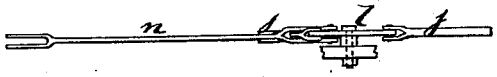

Fig: 5

Witnesses:
A. Moraga
E. C. Wibb.

Inventor:
James McCulloch
by his attorney
A. V. Briesen

UNITED STATES PATENT OFFICE.

JAMES McCULLOCH, OF KINGSTON, PENNSYLNANIA.

IMPROVEMENT IN DUMPING-CAGES FOR ELEVATORS.

Specification forming part of Letters Patent No. **160,112**, dated February 23, 1875; application filed January 21, 1875.

To all whom it may concern:

Be it known that I, JAMES McCULLOCH, of Kingston, in the county of Luzerne and State of Pennsylvania, have invented a new and Improved Self-Dumping Cage for Mines, &c., of which the following is a specification:

Figure 1 is a side view of my improved self-dumping cage, showing it suspended in a shaft. Fig. 2 is a bottom view of the same; Fig. 3, a vertical transverse section on the line *c c*, Fig. 2. Fig. 4 is a side view of the locking and unlocking mechanism; and Fig. 5, a bottom view, in dotted lines, showing the parts of the cage in the position of dumping the hutches.

Similar letters of reference indicate corresponding parts in all the figures.

The object of this invention is to produce, for coal and other mines, &c., an automatic self-dumping cage, which may be applied to hoisting apparatus in such a manner that during the ascent and descent its platform will be firmly locked to such hoisting apparatus in a horizontal position, whereas, on arriving at the mouth of the mine, the platform will be inclined to dump the hutch or car that is placed and secured thereon. As soon as the hoisting apparatus is allowed to descend by its own weight the platform will be righted and relocked in a horizontal position, together with the car that is placed thereon.

In the accompanying drawing, the letter A represents the shaft of the mine, or the framing that lines said shaft. B is the hoisting-cage or hoisting mechanism, which carries the tilting platform C, and which is connected with machinery at the top of the mine by means of a rope or chain, D, so that it can be raised and lowered in the requisite manner. The frame of the cage is, for greater security, guided on vertical posts *a a* that extend along the shaft, which said posts are partly embraced by grooved uprights *b b* of the cage, as clearly indicated in the drawing. To these grooved uprights, which, at their lower ends, are connected by a cross-bar, *d*, are attached metallic plates *e e*, which plates are, at their ends, braced by rods *f f* to the upper ends of the uprights *b*, all as shown in the drawing. These uprights *b*, together with their connecting cross-pieces and with the metal plates *e e*, constitute the frame proper of the hoisting mechanism or cage. In the metal plates *e e* are hung the ends of a crank-shaft, *g*, which crank-shaft is clearly shown in Fig. 3, and which is hung in such a position that its cranks project upwardly, as shown. The platform C has downwardly-projecting side pieces *h h*, through which the body of the crank-shaft *g* passes, said platform being thus hung, by means of the crank-shaft, to the frame of the hoisting mechanism or cage, and on this crank-shaft the platform C may be vibrated. In its horizontal position the platform C also rests on a cross-bar, *i*, that extends between the two plates *e e*, as indicated in Fig. 1; and in this position the said platform is locked and secured by means of two bolts, *j j*, that are connected to a bell-crank, *l*, which is either pivoted to the under side of the platform C or to a cross-piece connecting the side pieces *h* thereof. The outer ends of these bolts *j j*, which are clearly shown in Fig. 2, engage beneath inwardly-projecting lugs *m*, which are formed on the inner faces of the metal plates *e e*. The bell-crank *l* connects, by a third arm, with a rod, *n*, that joins a lever, *o*, that is pivoted underneath the platform C, near the front end thereof. I call that end of the platform the front end which is to be lowest in dumping.

When the parts are thus locked and in the position indicated in Fig. 2, the platform C will be securely attached to the cage B, and incapable of vibrating on its crank-shaft *g;* but upon approaching the mouth of the mine, or at that part where the hutches or hutch attached to the platform C are or is to be dumped, the projecting end of the lever *o* will enter an inclined groove, *p*, which is formed in the side of the shaft or frame A for the reception of the end of said lever; and in this groove the lever *o*, while ascending with the elevating-platform, will have its free end gradually swung forward, and will, by such motion, draw the rod *n* and swing the bell-crank *l*, so as to withdraw the bolts *j j* from beneath the lugs *m*. The platform C is then free to be inclined or dumped. This dumping motion is produced by two projecting pins, *r r*, that are formed at the front end of the platform C and catch beneath stationary hooks *s*, which are secured to the upper part of the shaft.

By these hooks the front end of the platform is detained at a low level, while the hoisting apparatus continues to elevate the cage B, and with it the crank-shaft *g*, and, consequently, also the central part of the platform C, so that thus, finally, the parts are brought into the position shown by dotted lines in Fig. 1.

Fig. 5 shows, by dotted lines, the position of the bolts *j j* and their connection with the lever *o*, as the same appear when the bolts *j* have been withdrawn from beneath the lugs *m*.

It will be observed that the crank-shaft *g* is a very important part of the mechanism herein described, as the operation could not be carried on in the manner described if the platform C were directly pivoted in the frame B without the use of the crank-shaft, for, on dumping the platform and retaining its front end in the same plane which it occupied before dumping, the distance of such front end from the point of connection of the shaft *g* with the frame B is increased, which increase is, in this mechanism, produced by the vibration of the shaft *g*, which, from the vertical position shown in the lower part of Fig. 1, is brought into the inclined position shown in the upper part of said figure during the dumping process. After the hutch or hutches have been dumped the frame B or cage is let down again, and the platform C will then, by its own weight, resume its horizontal position as soon as the cranks on the crank-shaft *g* arrive about on a level with the pins *r*. The farther descent of the cage will bring the end of the lever *o* into the groove *p*, and as the cage continues to descend the lever *o* will, in this groove, be swung inward again to relock the bolts *j* beneath the lugs *m*, and thereby refasten the platform C in its horizontal position, in which it remains during the continued descent, and during the subsequent ascent, until it is again to be dumped.

I claim as my invention—

1. The combination of the hoisting-frame B, having the side plates *e e*, with the crank-shaft *g*, which supports the platform C, and with the dumping-stops *r* and *s*, all arranged to render the platform self-dumping without changing the location of its front end and stops *r*, substantially as herein shown and described.

2. In combination with the dumping-platform C of a hoisting-cage, the bolts *j*, levers *n o*, and inclined stationary guide *p*, all arranged to automatically unlock the pivoted platform during the ascent, and relock it during the descent, of the cage, substantially as specified.

JAMES McCULLOCH.

Witnesses:

JOHN H. SMITH,

WILLIAM BRYDEN.