

No. 689,993.

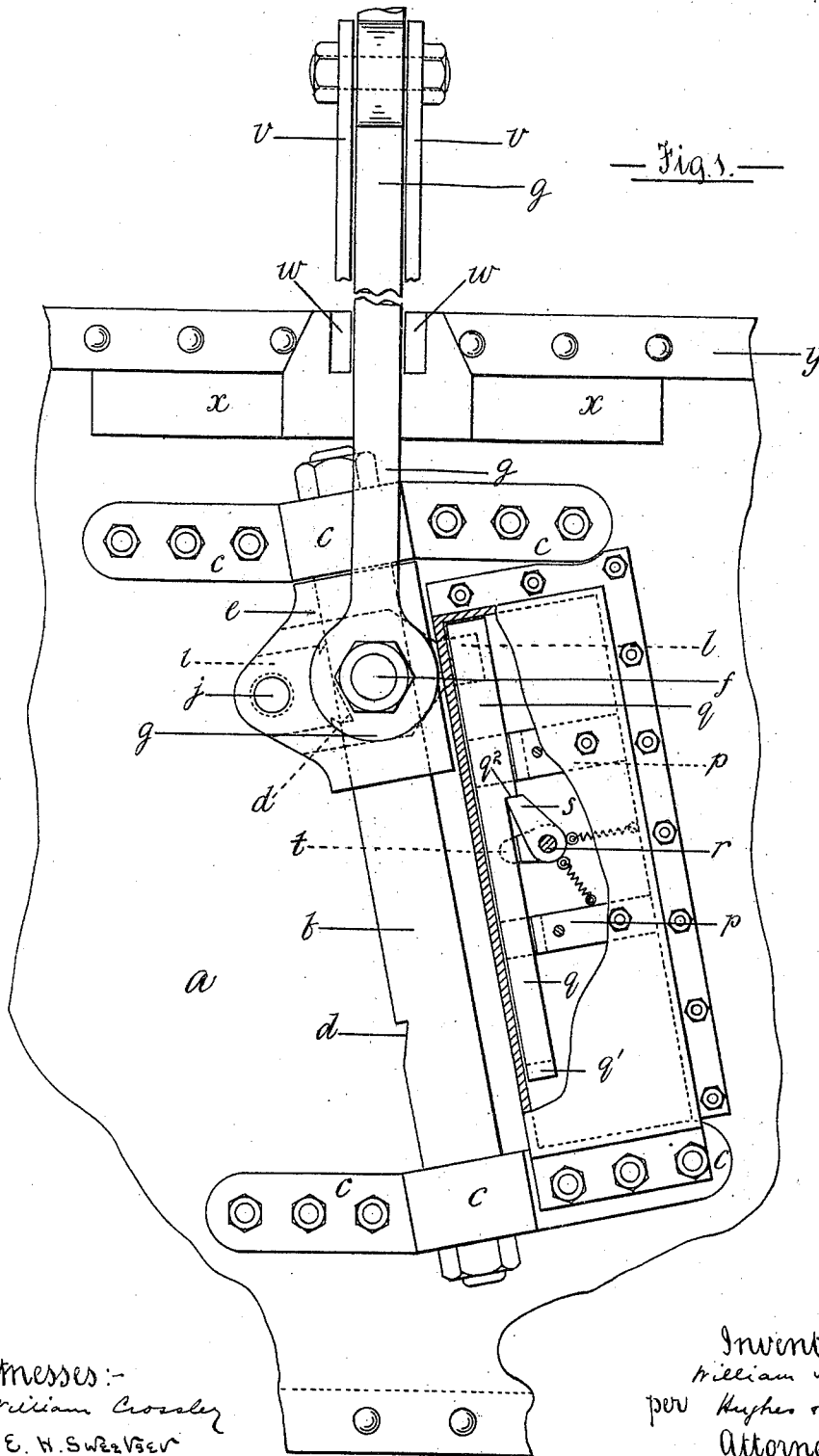
Patented Dec. 31, 1901.

W. SMITH.  
AUTOMATIC TIPPING SKIP.

(Application filed Aug. 29, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:-  
William Crossley  
E. H. SWERDSEV

Inventor  
William Smith  
per Hughes & Young  
Attorneys.

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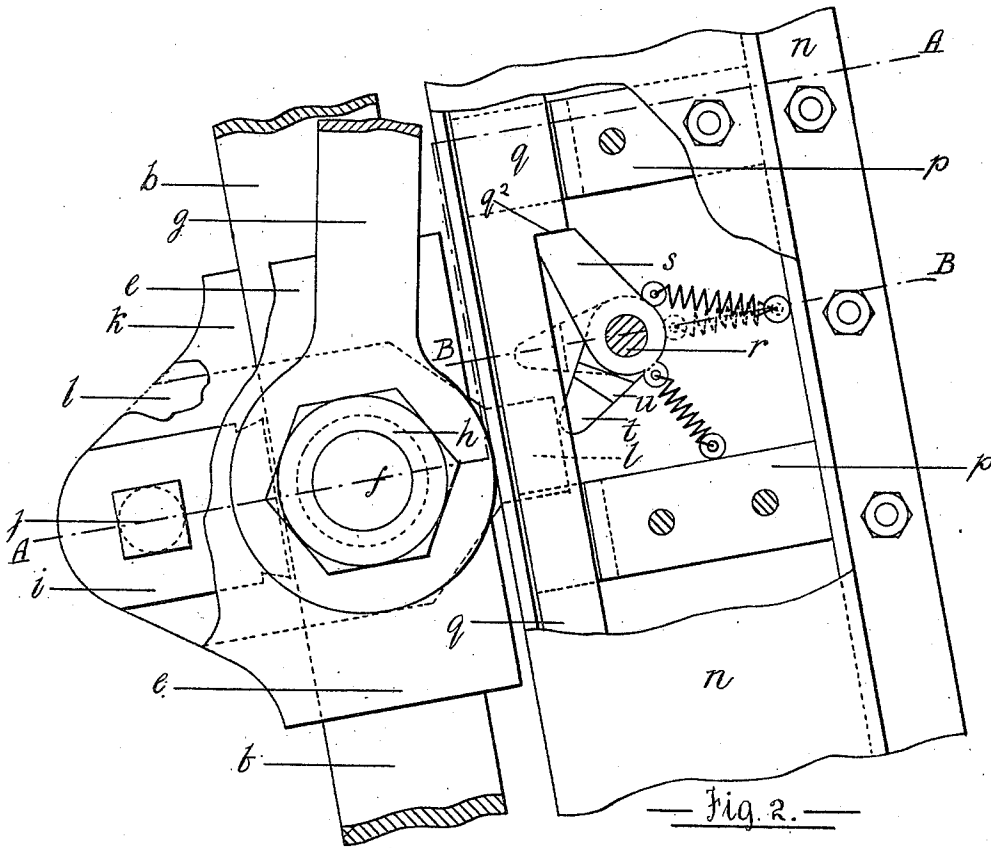
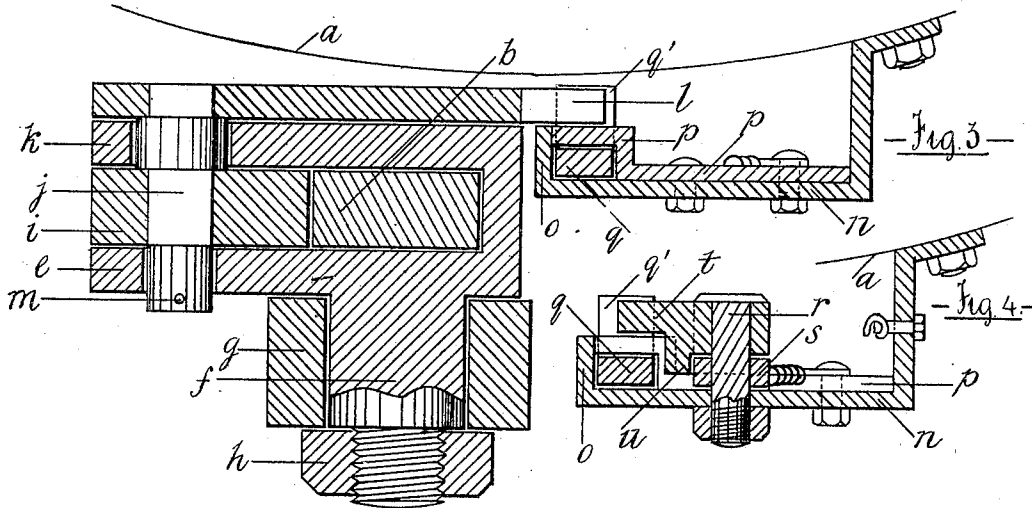
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4 Sheets—Sheet 3.

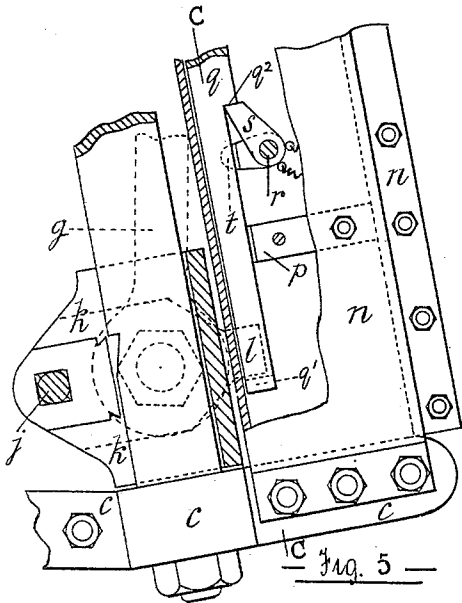


Fig. 5

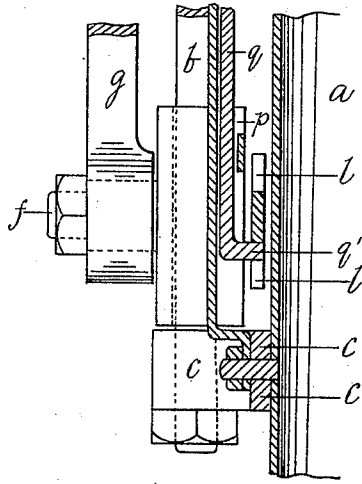


Fig. 6

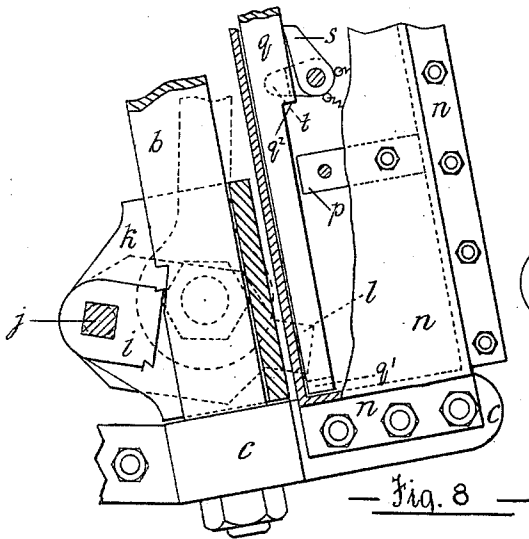


Fig. 8

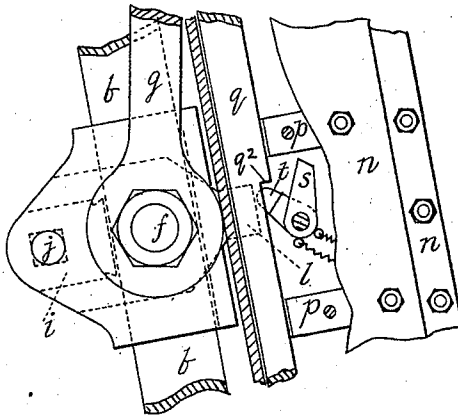


Fig. 7

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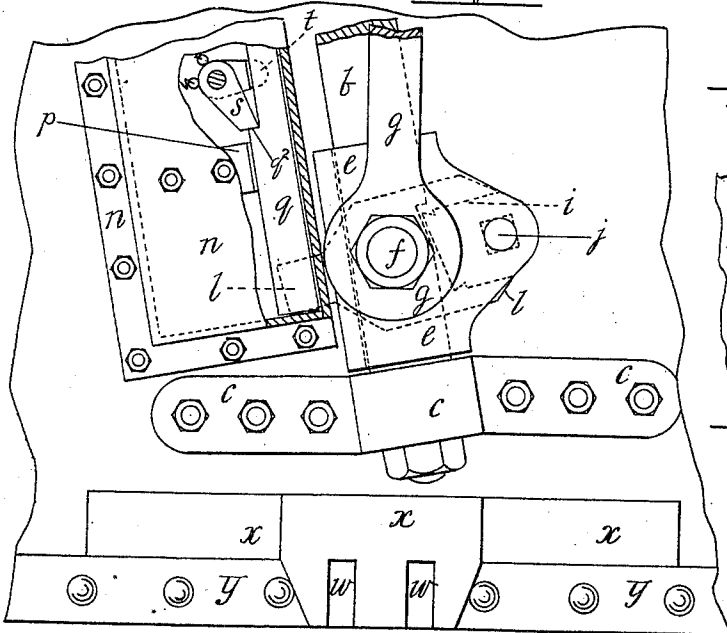
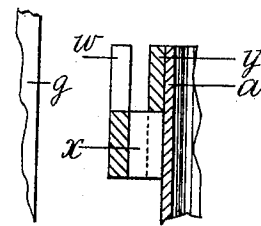
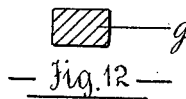
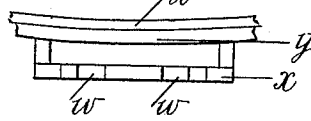
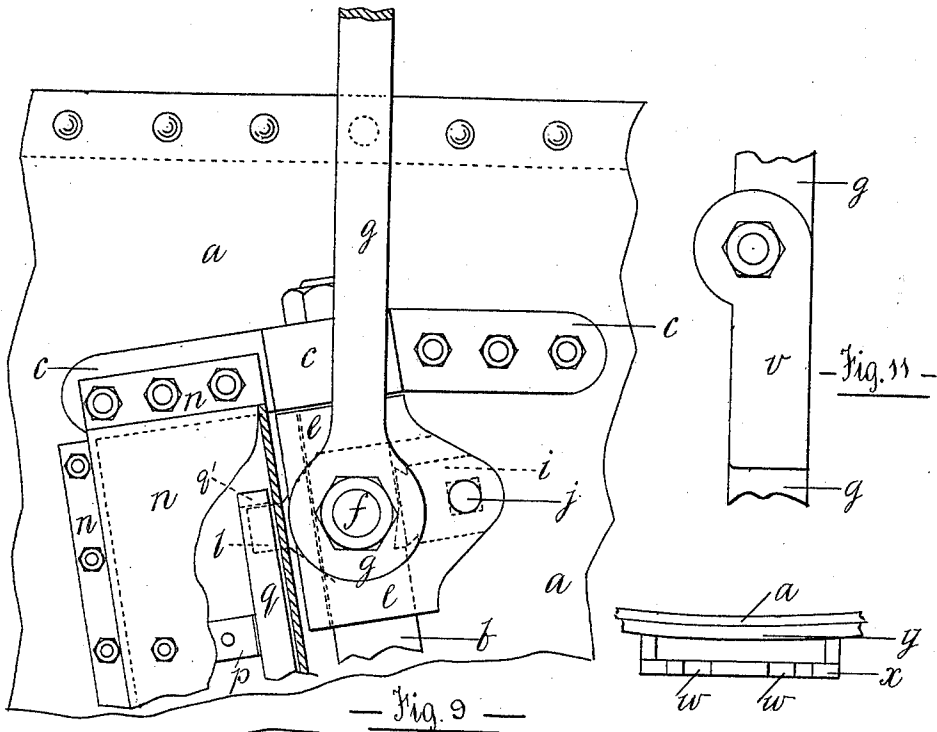
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(Application filed Aug. 29, 1901.)

(No Model.)

4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE

WILLIAM SMITH, OF LANDPORT, ENGLAND.

## AUTOMATIC TIPPING SKIP.

SPECIFICATION forming part of Letters Patent No. 689,993, dated December 31, 1901.

Application filed August 29, 1901. Serial No. 73,717. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM SMITH, of 16 Grafton street, Landport, in the county of Hampshire, England, have invented new and useful Improvements in Automatic Tipping Skips, of which the following is a specification.

My invention relates to improvements in automatic tipping skips for lifting earth, coal, ores, and other materials, the object being to provide an article of the kind which can be tipped and righted by the man in charge of the crane (to the chain or rope of which the skip is hooked in the ordinary way) simply by the raising and lowering of the said chain or rope. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view with skip upright. Figs. 2, 5, 7, and 8 are side views of parts of the mechanism in various positions. Fig. 3 is a section at A A, Fig. 2. Fig. 4 is a section at B B of the same figure. Fig. 6 is a section through C C of Fig. 5. Figs. 9 and 10 are side views of parts of the mechanism, showing the action when the skip is inverted. Fig. 11 is a side view of pawl for keeping the skip upright under certain circumstances. Fig. 12 is a plan, and Fig. 13 a side view, of the arrangement for receiving the pawl shown in Fig. 11.

Attached to each side of the skip *a* and at an angle of sixty-nine degrees with the bottom thereof is a flat bar *b*, having reduced and squared ends passed through brackets *c*, also attached to the skip *a*, the ends of the bars *b* being provided with nuts outside the brackets *c*. In each of the bars *b* are two taper notches *d*, and on each bar *b* is free to slide a box *e k*, each provided with an outstanding pin *f*, and these pins *f* pass through holes (eyes) formed to receive them at the ends of the handle (hanger) *g*, on opposite sides of the skip *a*. Each eye is prevented from coming off the pin *f* by a nut, which, however, allows the pin *f* to move freely in the eye. Between the inner cheek *k* and the outer cheek *e* of the box *e k* is a pawl *i*, turning on the pivot *j*. The pivots *j* are rounded where they pass through the pawl *i*. The inner end of each pivot *j* is squared and attached to one end of a lever *l*, and for extra

safety a split pin *m* is passed through the outer end of pivot *j*. As the pawl *i* and lever *l* are thus connected any movement of the lever *l* will cause a corresponding movement of the pawl *i*. The boxes *e k* slide on the bars *b*, and by reason of those bars being at an angle when the pins *f* are at the tops of the bars they will be exactly in the vertical center and above the horizontal center of the skip, and when they are at the bottoms of the bars *b* they will be toward one side of the vertical center and below the horizontal.

Bolted to the skips, so that the boxes *e k* will clear them when sliding up and down the bars *b*, are the guard-plates *n*. It will be seen from Figs. 3 and 4 that the guard-plates *n* are bent, one edge being attached to the skip *a*, the other standing away from the skip and being turned over somewhat at *o*, but not sufficiently to interfere with the up-and-down movement of the lever *l*. The upper and lower ends of the guard-plate *n* are simply turned over and bolted to the skip *a*. Guard-strips are bolted to the under side of the plate *n* and are of such shape as to provide slots (see Figs. 3 and 4) in which slide catch drop-bars *q*, Figs. 1, 2, 3, and 4, which are prevented from entirely slipping out of the slots by the turned-over top and bottom edges of the plate *n*. The drop-bars *q* have their lower ends turned inward toward the skip *a* and below the lever *l*, as shown at *q'*, Fig. 6. For a part of its length each drop-bar *q* is reduced in width, so as to provide a catch projection or stop corner *q''*, as shown on the drawings.

Firmly fixed in the guard-plate *n*, midway between the strip *p* and at a proper distance from the drop-bar *q*, is a bolt *r*, Figs. 2 and 4, on which swing the catches *s* and *t*, Figs. 2 and 4, the outer catch *s* being somewhat longer than the inner one *t*. The catch *s* has a spring which keeps it normally in the position shown at Figs. 1 and 2, and the catch *t* has a similar spring, which keeps it normally as shown at Fig. 1. The catch *t* has a projecting shoulder *u* on the outer face, Fig. 2, and this shoulder *u* overlaps the catch *s* in such a way that where the catch *t* is pushed upward the catch *s* is forced in the same direction by the shoulder *u* pressing against it. When the skip is ready for use,

the drop-bars  $q$  are kept in the position shown by Fig. 1 by the outward catch  $s$  engaging with the catch projection or stop corner  $q^2$ .

In operation the handle  $g$  of the skip is fastened to the chain or rope of the crane in the usual manner by a hook, and on the skip being lowered to the ground to be filled the weight of the handles pushes the slide-boxes  $e k$  to the lower ends of the bars  $b$ . In so doing the ends of the levers  $l$ , moving in the same vertical lines as the catches  $t$ , Fig. 4, come in contact with them (the catches  $t$ ) and force them downward, as shown in Fig. 2; but they (the catches  $t$ ) are returned to the position shown by the dotted lines by the action of the springs directly the levers  $l$  have passed them. When the boxes  $e k$  reach the bottoms of the bars  $b$ , the ends of the levers  $l$  rest on the inturned ends  $q'$  of the drop-bars  $q$ , and the edges of the pawls  $i$  are thus kept parallel with the bars  $b$ , Figs. 5 and 6. In order to show the pawl  $i$  and the bar  $b$  more clearly, the outer cheek  $e$  of the box is not shown in Figs. 5 and 6. When the skip is filled, the crane is set in motion, the handle is pulled upward, and the boxes  $e k$  slide up the bars  $b$ , the ends of the levers  $l$  again coming in contact with the catches  $t$ , which they force upward. The shoulders, as before explained, press back the catches  $s$ , and so remove them from under the corner  $q^2$  of the drop-bars  $q$ , (see Fig. 7,) which by their own weight fall till they rest on the turned-over ends of the guard-plates  $n$ . When the slide-boxes  $e k$  reach the tops of the bars  $b$ , the skip is raised by the crane. The boxes are now in the position of the one shown in Fig. 1, and the drop-bars  $q$  and catches  $s$  and  $t$  are as shown in Fig. 8. The skip  $a$  being then swung around by the crane over the place where it is to be emptied is lowered and on touching the ground the boxes again slide to the bottoms of the bars  $b$ . When the pawls  $i$  reach the lowermost of the notches  $d$  in the bars  $b$ , the levers  $l$  (having now no support from the inturned ends  $q'$  of the drop-bar  $q$ , which has dropped too low) fall into the position shown in Fig. 8, and when the handle is again pulled upward the pawls  $i$  catch fairly in the notches  $d$  and prevent the boxes  $e$  from moving on the bars  $b$ . The result is that the crane still continuing to pull the handle upward lifts the skip from the ground, and the pins on which the skip swings from the handle being now out of the vertical center and below the horizontal center of the skip it (the skip) capsizes and empties itself. At the same time the levers  $l$  fall by their own weight into the position shown in Fig. 9 (which shows the skip upside down) and the pawls  $i$  leave the notches  $d$ . The skip  $a$  is then again lowered to the ground and the boxes  $e k$  move down to the other ends of the bars  $b$ , (which are really the upper ends, but in this position the lower ends.) In sliding down the levers  $l$  press the catches  $s$  away from the bars  $q$ , (as before ex-

plained,) which may have been retained in the position shown in Fig. 8 by the pressure of the said catches  $s$  against their sides, whereupon they fall into the position shown in Figs. 9 and 10 and the corners  $q^2$ , one caught by the catches  $s$ , as shown in Fig. 10. The levers  $l$ , having no support at the end, (owing to there being no inturned part at this end of the drop-bars  $q$ ,) fall, and the pawls  $i$ , working in unison, enter the notches  $d$ , as shown in Fig. 10. When the skip is again raised to be filled, the boxes  $e k$  being retained (by the pawls  $i$  in the notches  $d$ ) below the horizontal center and the weight of the bars  $b$  being to one side of the vertical center of the skip, it (the skip) rights itself. The levers  $l$  and pawls  $i$  fall into the positions shown in Fig. 1. If it be required (as is necessary in filling and moving skips) to keep the handle in an upright position when it is unhooked from the chain or rope of the crane, the boxes  $e k$ , being at the bottom of the bars  $b$ , pawls  $v$ , Figs. 1 and 11, which swing on a bolt passed through the handle, (on one side only,) are pushed through by hand into openings  $w$ , Figs. 1, 11, 12, and 13, provided in a bracket  $x$ , which is riveted, on one side only, under the hoop-rim  $y$  of the skip  $a$ . When the skip is raised by the crane again, the pawls  $v$  disengage themselves and fall by their own weight into the position shown in Fig. 1 clear of the bracket  $x$ , in which position they remain while the skip is being used, as herebefore described.

What I claim as my invention, and desire to secure by Letters Patent, is—

In an automatic tipping skip the combination therewith and on two opposite sides thereof of a bar on each side inclined at an angle of sixty-nine degrees with the bottom of the skip: brackets attached to the skip to support the ends of the bars: there being a notch near each end of each of the bars: a box free to slide on each bar: a pin outstanding from each box to enter the eye of the handle of the skips: there being a projection on each box: a pawl pivoted to each projection and moving with the said projection: guard-plates attached to the sides of the skip and parallel with the bars: a drop-lever free to move up and down under its guard-plate, the said lever being parallelly wider at one end than at the other, the free extremity of the narrow end being inturned: two spring-controlled catches pivoted between the guard-plate and the skip one of them to engage with the pawl-lever and the other with the drop-lever substantially as described.

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

WILLIAM SMITH.

Witnesses:

WILLIAM ROBERTS SWAKES,  
WILLIAM JAMES ROACH.