2 Sheets—Sheet 1.

W. D. PRIESTMAN & S. PRIESTMAN.

Apparatus for Working Grapple, Buckets, Forks or Skips.

No. 203,771. **Patented May 14, 1878.**

FIGURE 2

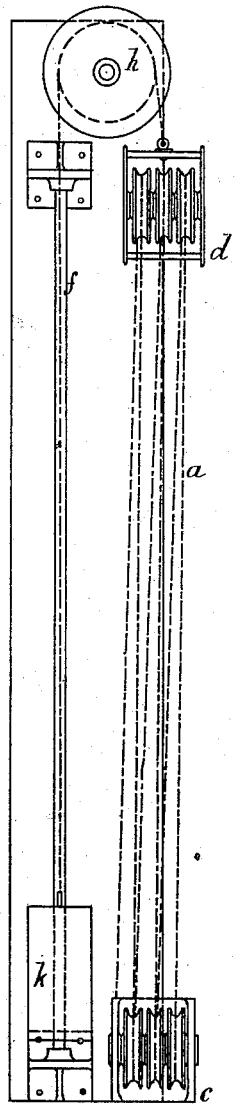


FIGURE 1

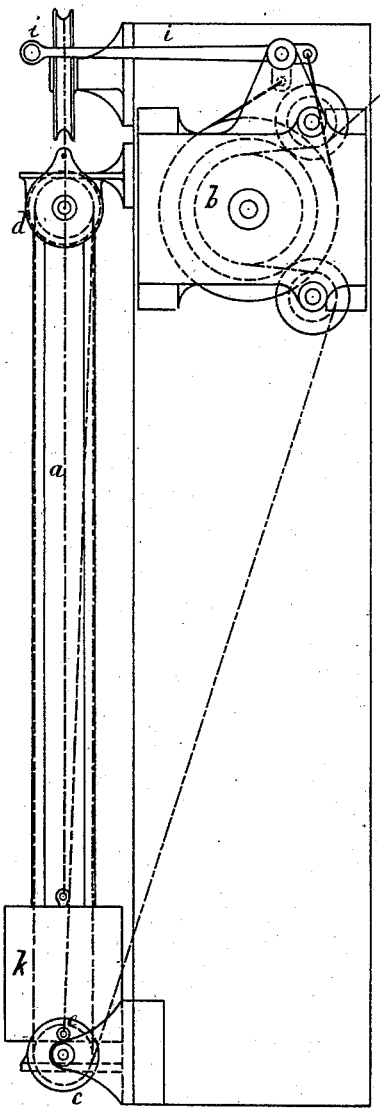


FIGURE 3

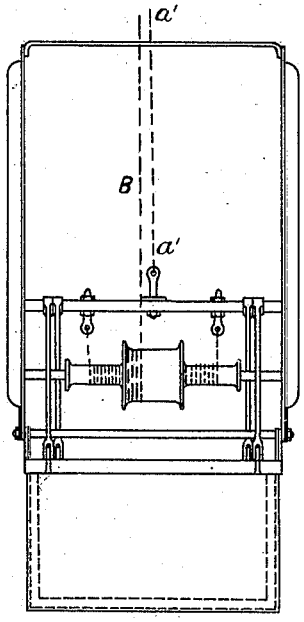
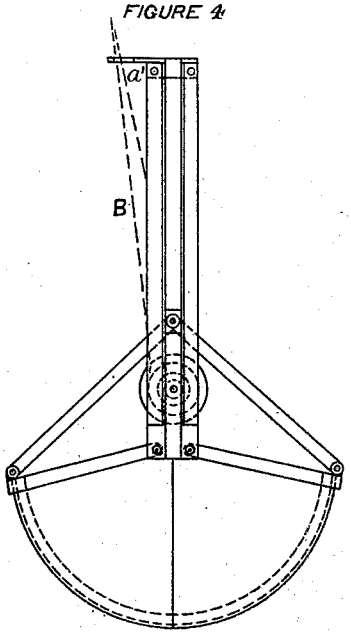


FIGURE 4



Witnesses—
L. G. Garretson
R. L. Garretson

Inventors—
William Dent Priestman
Samuel Priestman—
By Amos Broadwell Atty.

2 Sheets—Sheet 2.

W. D. PRIESTMAN & S. PRIESTMAN.

Apparatus for Working Grapple, Buckets, Forks or Skips.

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PART OF FIG 5.

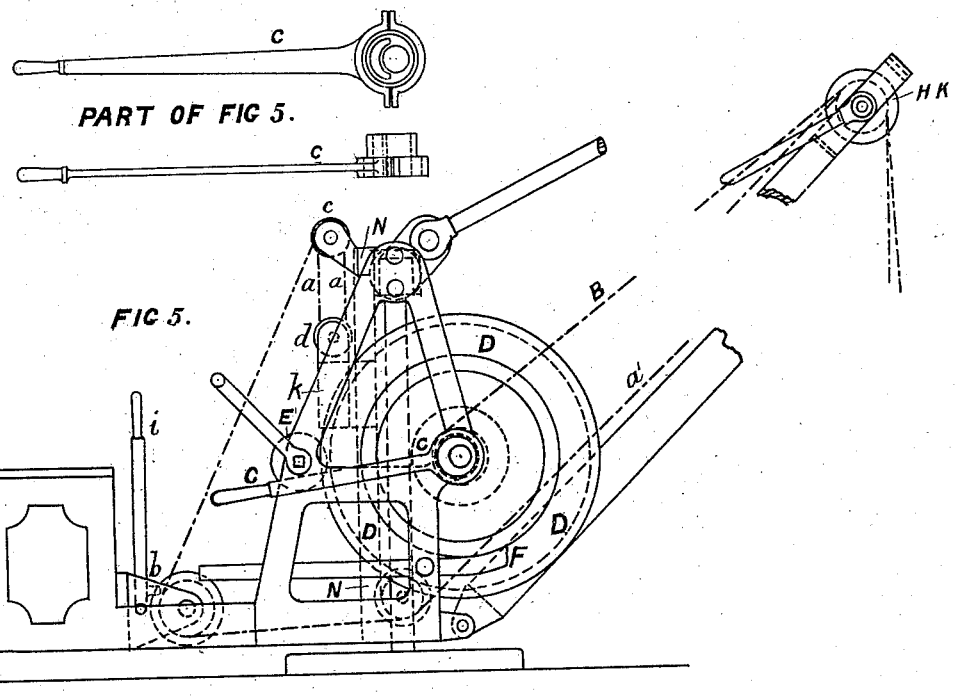
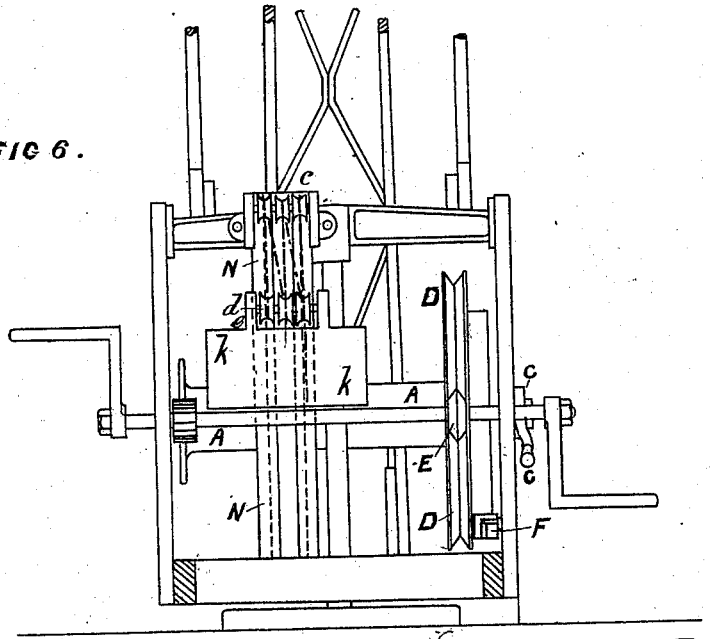


FIG 5.

FIG 6.



Witnesses-
L. G. Garretson
R. L. Garretson

Inventors { William Dent Priestman
Samuel Priestman
By Thompson & Co Attys

UNITED STATES PATENT OFFICE.

WILLIAM D. PRIESTMAN AND SAMUEL PRIESTMAN, OF KINGSTON-UPON-HULL, ENGLAND.

IMPROVEMENT IN APPARATUS FOR WORKING GRAPPLE BUCKETS, FORKS, OR SKIPS.

Specification forming part of Letters Patent No. **203,771**, dated May 14, 1878; application filed February 23, 1878.

To all whom it may concern:

Be it known that we, WILLIAM DENT PRIESTMAN and SAMUEL PRIESTMAN, both of Kingston-upon-Hull, in the county of York, in that part of the United Kingdom of Great Britain and Ireland called England, have jointly invented certain new and useful Improvements in Apparatus for Working Grapple Buckets, Forks, or Skips; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which similar letters of reference, where they occur in the several separate figures, denote like or corresponding parts in the drawings.

Figure 1 is a side elevation of a block-and-brake arrangement according to our invention. Fig. 2 is a front view of Fig. 1. Figs. 3 and 4 illustrate a grapple-bucket to the working of which our invention is applicable. Fig. 5 is a side elevation of a crane with our invention applied thereto. Fig. 6 is a front view of Fig. 5.

In working self-acting grapple buckets, forks, or skips two chains or ropes are used, one being the lifting-chain and the other the opening or discharging chain. The buckets, forks, or skips are used for automatically filling themselves with and grappling material, and then, by means of a crane or other hoist, being elevated to certain heights by means of the lifting-chain, and afterward depositing the material where required by means of the opening or discharging chain.

To perform this operation it is necessary to take in or wind the opening or discharging chain to correspond with the lift of the hoisting-chain, and when the required lift has been attained to arrest the opening or discharging chain and slack or lower the lifting or hoisting chain, so that the weight coming onto the opening or discharging chain causes the bucket, fork, or skip to open or "keck" and discharge its contents.

Our invention consists in a certain block-and-brake arrangement, as illustrated at Figs. 1 and 2, and in a certain barrel arrangement, as illustrated at Figs. 5 and 6. The barrel arrangement is for working the lifting-chain and the block-and-brake arrangement is for working the opening and discharging chain.

Upon reference to the drawings, it will be seen that *a* is the opening or discharging chain. The end of the chain *a*, at *a'*, is led, by being passed round a sheave and over the jib of a crane or other hoist, to the discharging or opening connection, or mechanism, or attachment of a self-acting bucket, such as shown at Figs. 3 and 4. The other portion of the chain is led through the brake arrangement *b*, and from thence round the fixed sheaves *c* and the sliding or moving sheaves *d*, alternately, the chain eventually being fixed to one or other of the sheave-frames, as at *e*. The sheaves *d* are connected, by means of the chain *f* passing round the pulley *h*, to the sliding weight *k*. The number of sheaves are regulated in accordance with the required elongation or lift of the chain *a*. The break *b* is operated by the lever *i*.

The carrying out of our invention with regard to the lifting-chain is illustrated by Figs. 5 and 6. Upon reference to these figures it will be seen that the barrel A, which winds the main or lifting chain B, is made to lift or cant by the hand eccentric-lever C, so that the movement or friction wheel D can be brought into gear and contact with the motion friction-pinion E or with the brake F, as may be required.

The opening, discharging, or kecking chain is led, as at *a'*, over the jib-sheave H, and the lifting-chain B is led over the jib-sheave K, and both chains are connected to the requisite parts of the bucket. The opening or discharging chain *a* passes round the strap-brake *b* and round the fixed sheaves *c* and the sliding sheaves *d*, in connection with the weight *k* working on the upright N. The handle-lever *i* of the brake *b* thus controls the working of the opening, discharging, or kecking chain *a a'*, and the eccentric handle-lever C, by its connection with the crane-barrel A, controls the working of the lifting or raising chain B.

In operation it will be seen that by putting the crane into gear by the handle C, and at the same time releasing the brake *b* by the handle *i*, the crane lifts the bucket, fork, or skip with its load by means of the chain B, and simultaneously the weight *k* takes in the

slack of the discharging-chain *a a'* by elongating the distance between the sheaves *c* and *d*. Upon the crane being thrown out of gear by the handle C, so as to bring the brake F into operation, the crane can be turned or moved with the load, and upon the barrel A being, by means of the handle C, held intermediately between the brake F and the motion-pinion E, so as to slightly slack the chain B, and the brake *b* being applied by the handle *i* to the opening, discharging, or kecking chain *a a'*, the bucket, fork, or skip opens, discharges, or kecks, and is ready to be lowered for another load, which is effected by releasing both chains.

Having thus fully set forth the nature of our invention and shown a system, mode, or manner in or under which the same is or may be used or practically carried into effect, we would have it understood that we do not lay any claim to the bucket or skip shown at Figs. 3 and 4, nor to the use of two chains for working such bucket; but

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination of two blocks containing any number of sheaves, and connected with a sliding weight or weights and a brake, so as to elongate the lift or haul required for the opening or discharging chain of self-acting buckets, or forks, or skips, and to arrest such lift for discharging such bucket, fork, or skip, substantially as set forth.

2. A crane or hoist having a barrel constructed to cant or lift for working the lifting-chain of a self-acting bucket, fork, or skip, and in combination with a block-and-brake arrangement, such as herein described, for working the opening and discharging chain of self-acting buckets, forks, or skips, substantially as described.

In witness whereof we, the said WILLIAM DENT PRIESTMAN and SAMUEL PRIESTMAN, have hereunto set our hands and seals this 12th day of December, in the year of our Lord 1877.

WILLIAM DENT PRIESTMAN. [L. S.]
SAMUEL PRIESTMAN. [L. S.]

Witnesses:

FRED. BLUNDELL MOSS,
Solicitor and Notary Public,
19 *Parliament Street, Kingston-upon-Hull, England.*

JAMES WRIGHT,
His Clerk.