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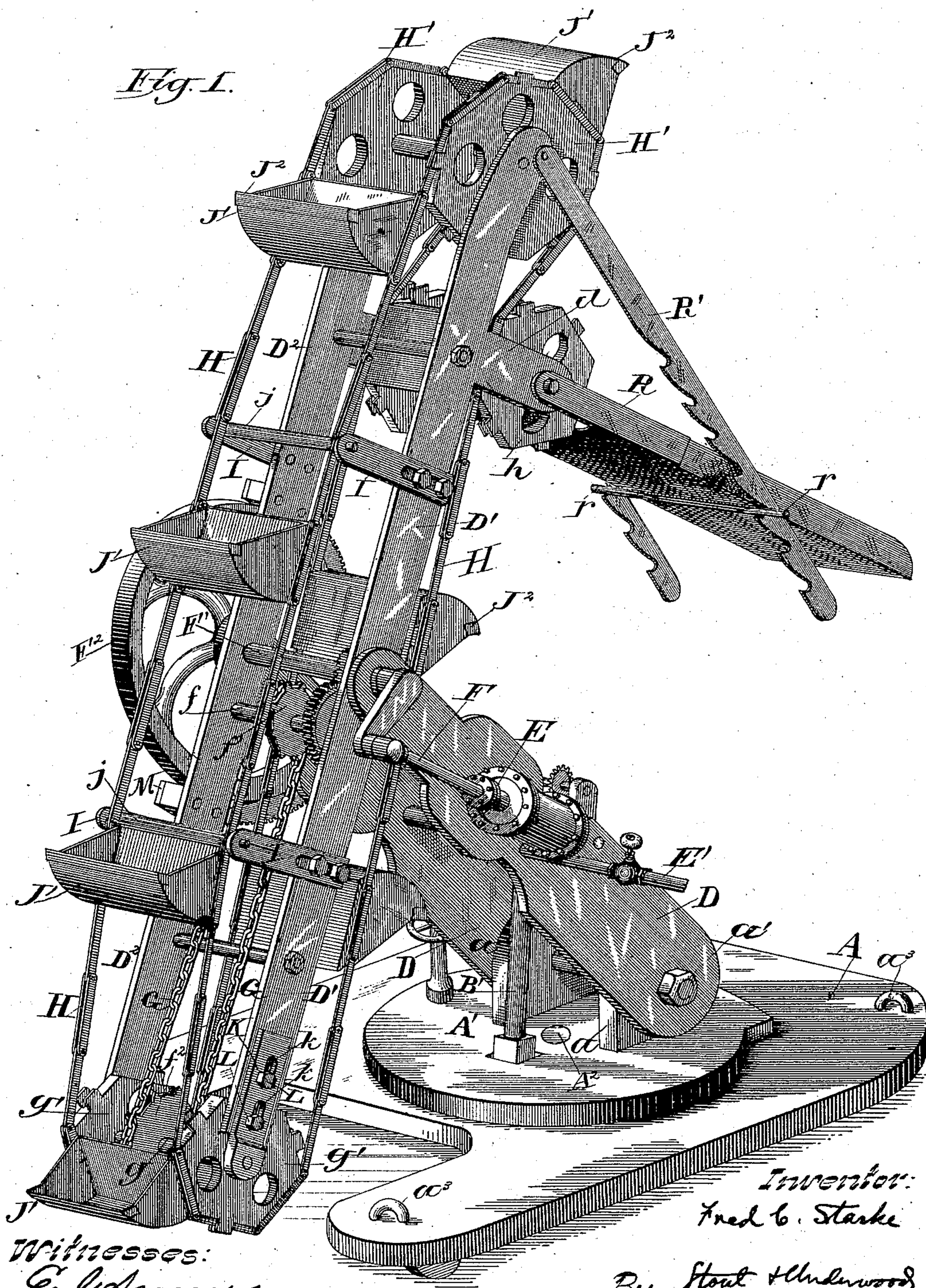
4 Sheets—Sheet 1.

F. C. STARKE.
PORTABLE ELEVATOR.

No. 305,639.

Patented Sept. 23, 1884.

Fig. 1.



Witnesses:

E. G. Thomas
H. J. Forsythe

Inventor:
Fred C. Starke

By Stout & Underwood
Attorneys.

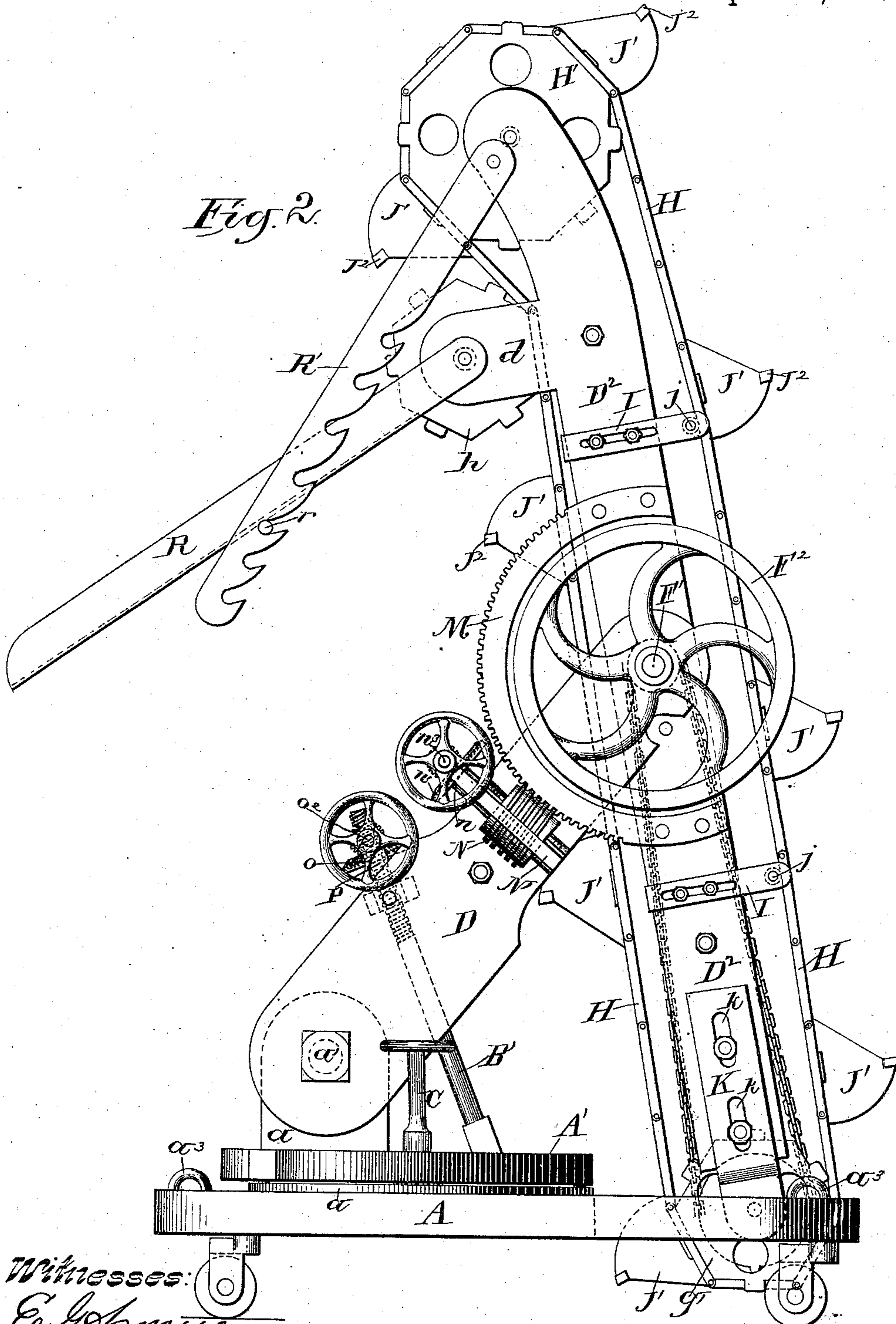
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F. C. STARKE.
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Patented Sept. 23, 1884.



Witnesses:
E. G. Smith
H. J. Dwyer

Inventor:
Fred C. Starke
By Stout & Underwood
Attorneys.

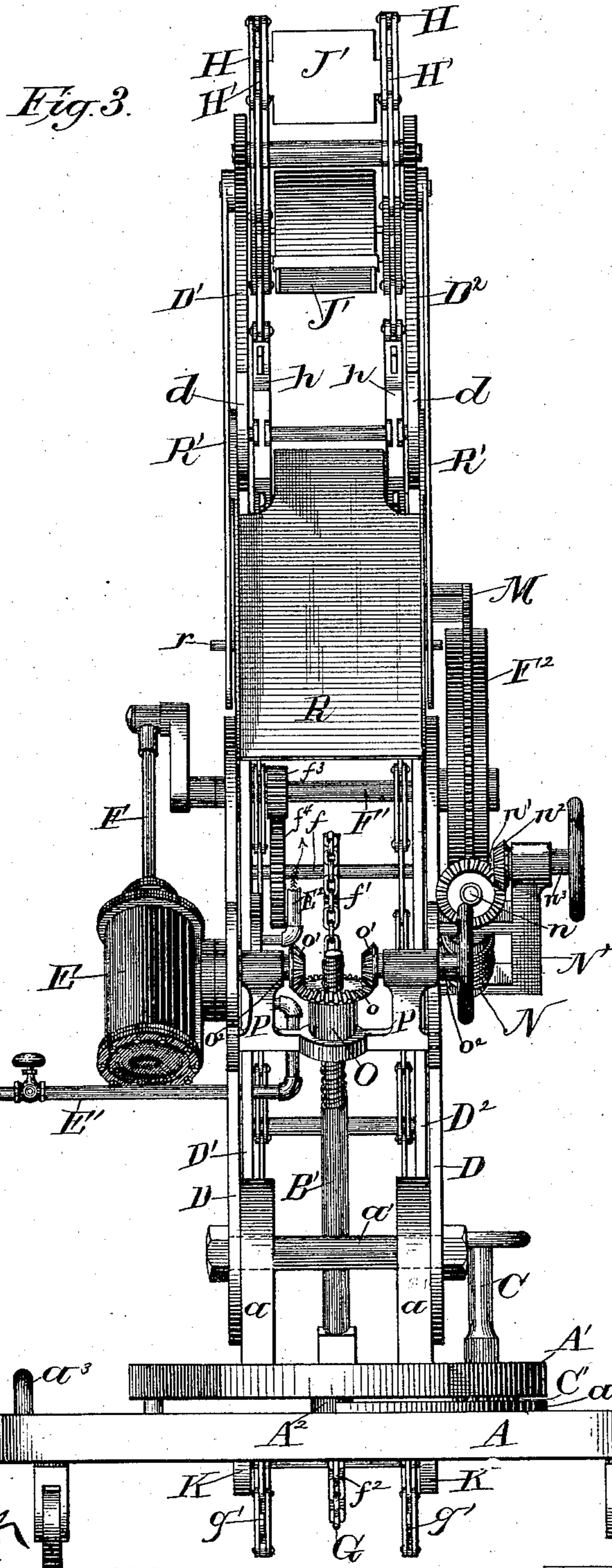
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F. C. STARKE.
PORTABLE ELEVATOR.

No. 305,639.

Patented Sept. 23, 1884.



Witnesses

E. J. Adams
H. J. Dwyer

Inventor:

Fred C. Starke

By *John H. Underwood*
Attorneys.

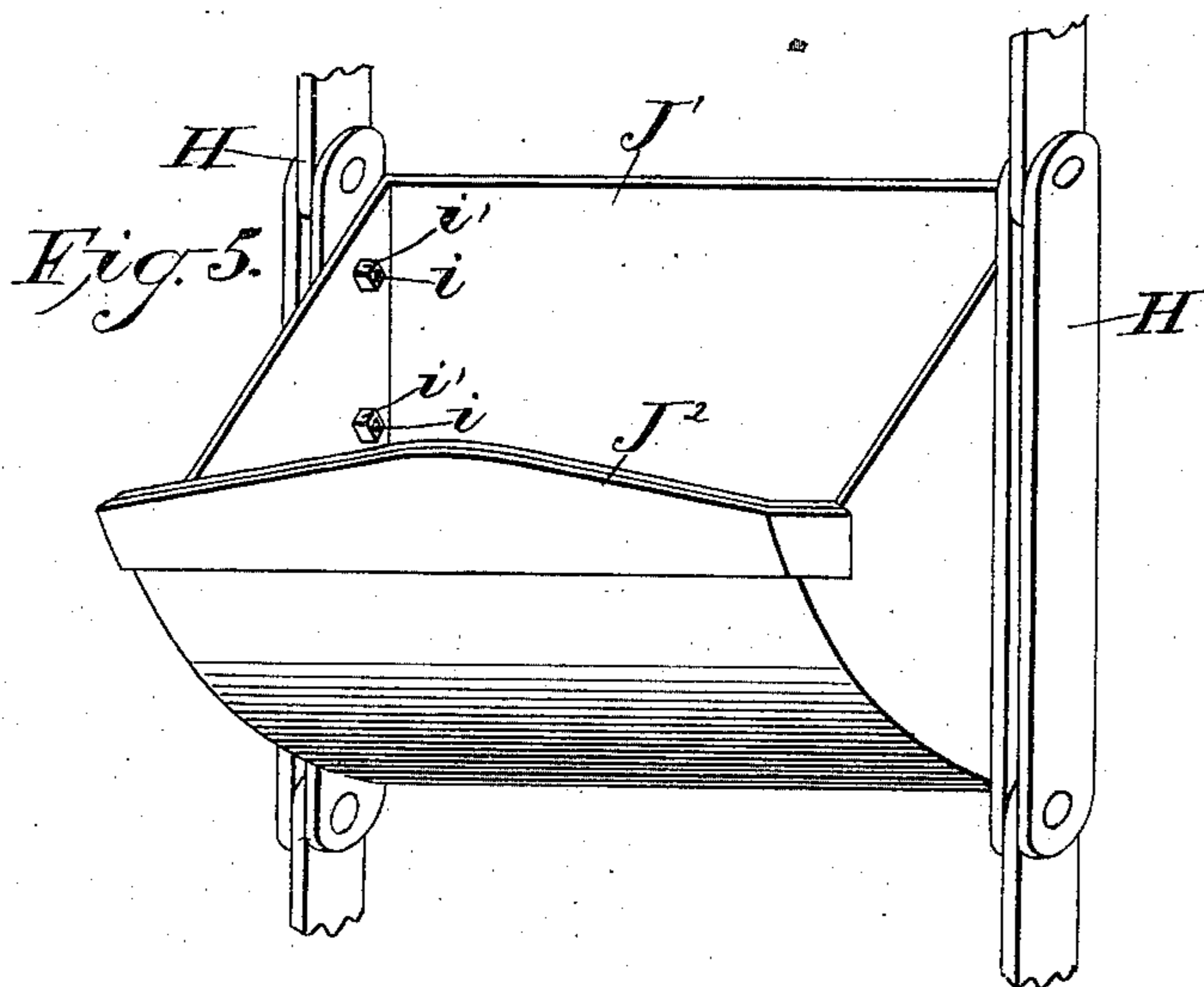
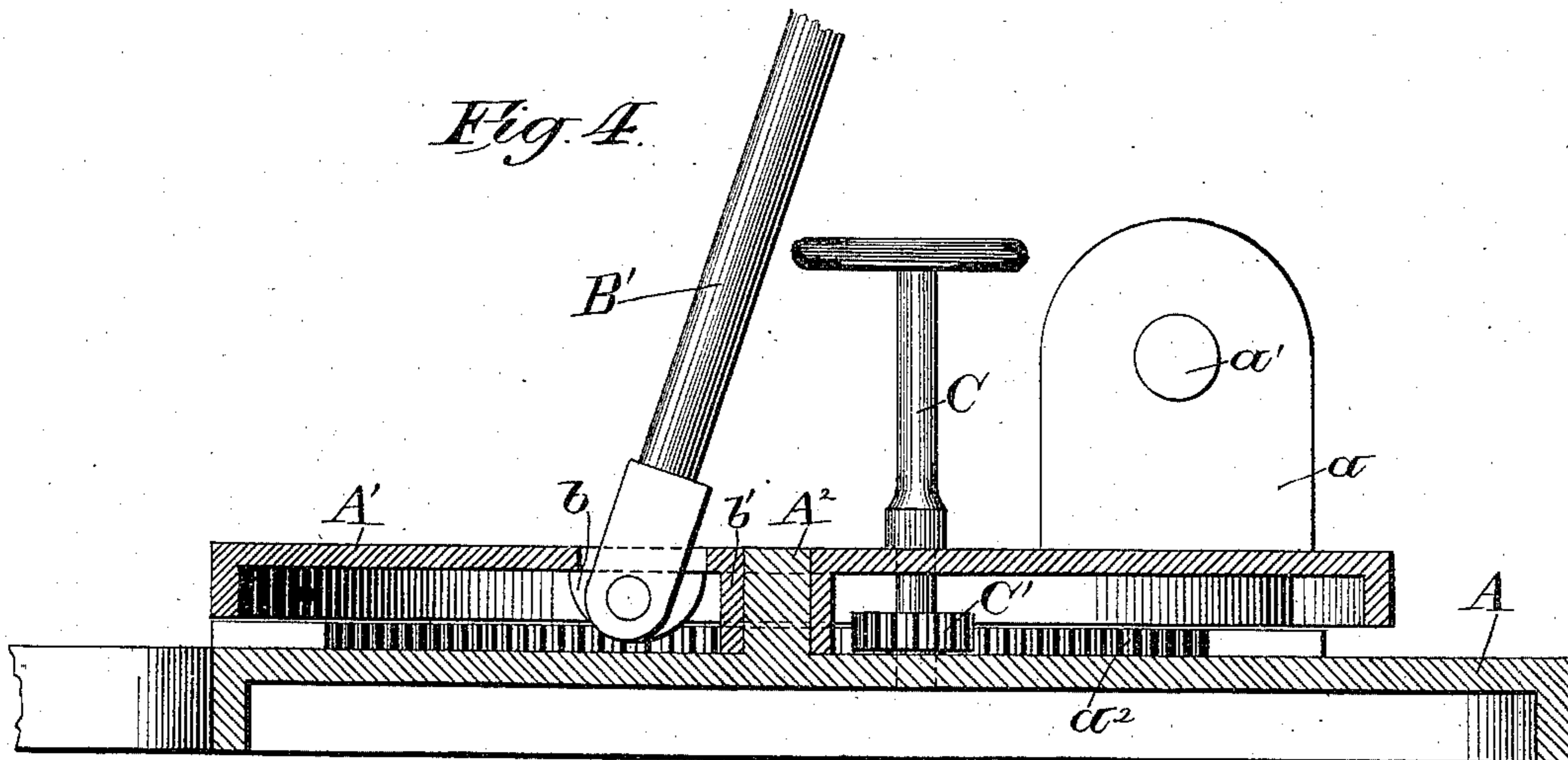
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F. C. STARKE.
PORTABLE ELEVATOR.

No. 305,639.

Patented Sept. 23, 1884.



Witnesses:

E. G. Smith
H. J. Smythe

Inventor:

Fred C. Starke

By Stout & Woodward
Attorneys.

UNITED STATES PATENT OFFICE.

FRED. C. STARKE, OF MILWAUKEE, WISCONSIN.

PORTABLE ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 305,639, dated September 23, 1884.

Application filed August 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRED. C. STARKE, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Portable Elevators; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to coal-elevators, and will be fully described hereinafter.

In the drawings, Figure 1 is a perspective view of my device. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation. Fig. 4 is a vertical section through the center of the derrick-platform, and Fig. 5 is a perspective view of one of the buckets.

A is the platform of my device, which normally rests upon casters; and A' is the base of my derrick, which is swiveled to the platform, and carries lugs *a a*, to which the standards D are pivoted by a bolt, *a'*.

B' is an adjusting-brace that is pivoted between lugs *b b*, that project down from the base A', which is of inverted-cup shape, and is slotted to permit the brace B' to pass through it. The platform has a spindle, A², projecting up from it, to form a pivot for the hub *b'* of the base A'. The base A' also carries an upright shaft, C, on the lower end of which is a pinion, C', that meshes with the teeth of a semi-annular rack, *a²*, fastened to or forming part of the platform, and by this shaft, pinion, and rack the base is turned.

D are swinging arms that support the members D' D² of the crane, over which the buckets travel.

E is an engine, that is fed by a hose, E', and has an exhaust-pipe, E². The piston F of this engine is wristed to the arm of a crank-shaft, F', which is geared by pinion *f³*, meshing with pinion *f⁴*, to a shaft, *f*, extending from one member of the crane to the other, and carrying a sprocket-wheel, *f'*, for the endless drive-chain G, which passes over another sprocket-wheel, *f²*, on a shaft, *g*, near the bottom of the crane, and the shaft of the sprocket-wheel *f²* carries near each end larger sprocket-wheels *g' g'*, which it drives, and which in turn drive the bucket-chains H, that pass over sprocket-wheels H' at the upper end of the crane, and are held in to the crane by still other sprocket-wheels, *h h*, on their return.

I I are adjustable brackets that carry rollers *j*, to hold the chains H out away from the crane in front, as they carry the buckets J' up when filled. The shaft *g* is journaled in the lower end of arms K, that are slotted at *k k*, and are adjustably secured each to a member of the crane by bolts L, passed through these slots, so as to admit of tightening the chains when this is desirable. The members of the crane D' D² are pivoted to the arms D by the crank-shaft F', which latter carries on its end opposite its crank a fly-wheel, F².

M is a semi-annular rack, the ends of which are firmly secured to the member D² of the crane, and taking in the teeth of this rack is the worm-wheel N, fastened onto the shaft *n*, that carries fast on its upper end the bevel cogged wheel *n'*, with which meshes a pinion, *n²*, keyed onto the inner end of the hand-wheel stem *n³*, journaled in the bearings of the bracket N'. This mechanism serves to give to the members D' and D² of the crane whatever inclination at which it is desired to work the buckets. The upper end of the brace B' is screw-threaded to work into a screw-threaded sleeve, O, the lower end of which has a bearing against the base of the bracket P, fastened between and to the swinging arms D, while the upper end of the said sleeve carries the bevel gear-wheel *o*, that meshes with the bevel-pinions *o' o'*, fastened onto the inner end of the hand-wheel stems *o² o²*, journaled in the bearings of the bracket P. By means of this arrangement the inclination of the swinging arms D may be increased or lessened, as it is found desirable to lower or raise the crane members on their base.

R is a chute, the sides of which are hinged on end of extensions *d d*, formed on the rear edges of the members D' and D² of the crane. This chute may be maintained on any suitable incline, according to the position of the crane, by means of the ratcheted bars R', hinging in the upper ends of the members, the stop-rod *r*, each end of which projects beyond the sides of the chute, being adapted to take into either opposing pair of the teeth of the said bars R'. The buckets J' are provided with re-enforces J², that are preferably made almost pointed in their centers, to enable them to readily enter the coal-pile, and these are bolted or riveted to the bucket proper, and when one wears out

it may be easily replaced by another. The chains are secured to the bucket, as shown in Fig. 5—that is, one-half of each double link is secured to the side of its bucket by countersunk bolts *i*, which are held in place by nuts *i'* on the inside of the bucket.

In order to provide for the attachment of my portable derrick to the hoisting-chains, the upper face of the platform A has suitable staples, as shown at *a*³.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A portable derrick adapted to be lowered down into the hold of a vessel, and having means, substantially as described, whereby elevating-buckets attached to an endless chain suitably mounted in the said derrick may be made to reach any point of the said vessel's hold around the said derrick, substantially as and for the purpose set forth.

2. In a portable derrick, in combination with elevating-buckets attached to an endless chain suitably mounted in the said derrick and driven thereon by means substantially as described, an adjustable chute hung in the upper end of the derrick, substantially as and for the purpose set forth.

3. In a portable derrick, the combination of the platform A, having spindle A² and semi-annular rack *a*², the base A', having hub *b'* and lugs *a a*, the shaft C, with pinion C', the swinging arms D, with bolt *a'*, the crane members D' and D², shafts *f* and *g*, sprocket-wheels *f'* and *f*² for endless drive-chain G, sprocket-wheels H' H', *g' g'*, and *h h* for bucket-chains H H, the buckets J', and chute R, substantially as shown and described, and for the purpose set forth.

4. In a portable derrick, in combination with the crane members D' D², having semi-annular rack M, the swinging arms D, having bracket N', shaft *n*, with worm-wheel N, cogged wheel *n'*, and hand-wheel stem *n*³, with pinion *n*², substantially as shown and described, and for the purpose set forth.

5. In a portable derrick, in combination with the base A', having lugs *a a* and *b b*, the swinging arms D, having bracket P, the brace B', with threaded upper end, threaded sleeve

O, with bevel cogged wheel *o*, and hand-wheel stems *o*² *o*², having pinions *o'* *o'*, substantially as shown and described, and for the purpose set forth.

6. In a portable derrick, in combination with the crane members D' D², the crank-shaft F', provided with suitable pinion, and shaft *f*, provided with corresponding pinion, drive-wheel F², and sprocket-wheel *f'*, and shaft *g*, with sprocket-wheel *f*² and chain G, and the engine-cylinder E, having receiving-pipe E', exhaust-pipe E², and piston F, substantially as shown and described, and for the purpose set forth.

7. In a portable derrick, in combination with the crane members D' D², having the sprocket-wheels H' H' and *g' g'* for the bucket-chains H, and sprocket-wheels *f'* and *f*² for the drive-chain G, the adjustable arms K K, slotted at *k k* to receive the adjusting-bolts L L, substantially as shown and described, and for the purpose set forth.

8. In a portable derrick, in combination with the crane members D' D², carrying the endless bucket-chains H H and having extensions *d d*, the sprocket-wheels *h h*, journaled in the said extensions, substantially as shown and described, and for the purpose set forth.

9. In a portable derrick, in combination with the crane members D' and D², and the bucket-chains H H, carried on the sprocket-wheels H' H', *g' g'*, and *h h*, the adjustable brackets I I, carrying bearing-rollers *j j*, substantially as shown and described, and for the purpose set forth.

10. In a portable derrick, in combination with the crane members D' and D², having extensions *d d*, the chute R, having stop-rod *r*, and the ratcheted bars R', substantially as shown and described, and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRED. C. STARKE.

Witnesses:

S. S. STOUT,

H. J. FORSYTHE.