

No. 760,250.

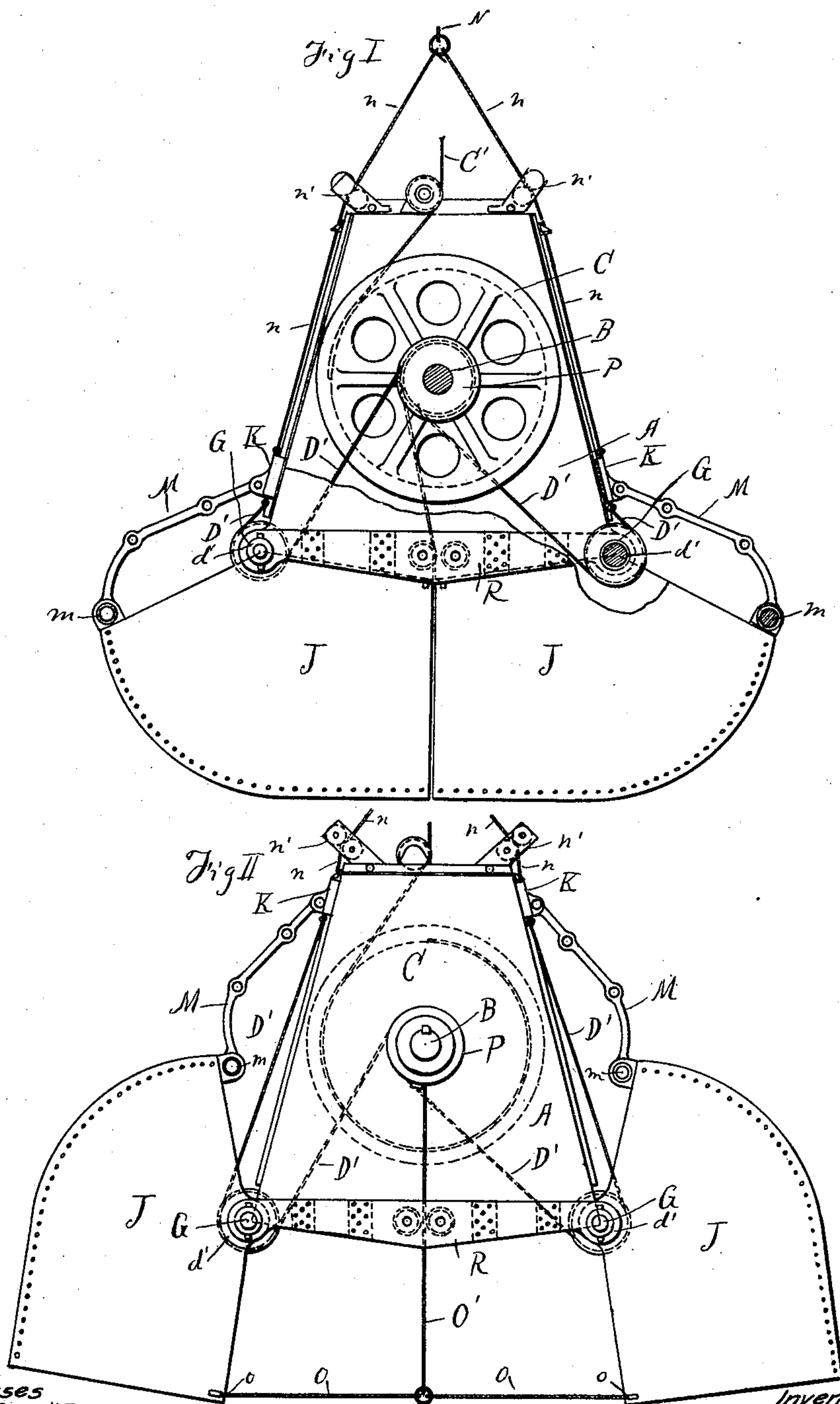
PATENTED MAY 17, 1904.

W. B. ROBERTS.  
GRAB BUCKET.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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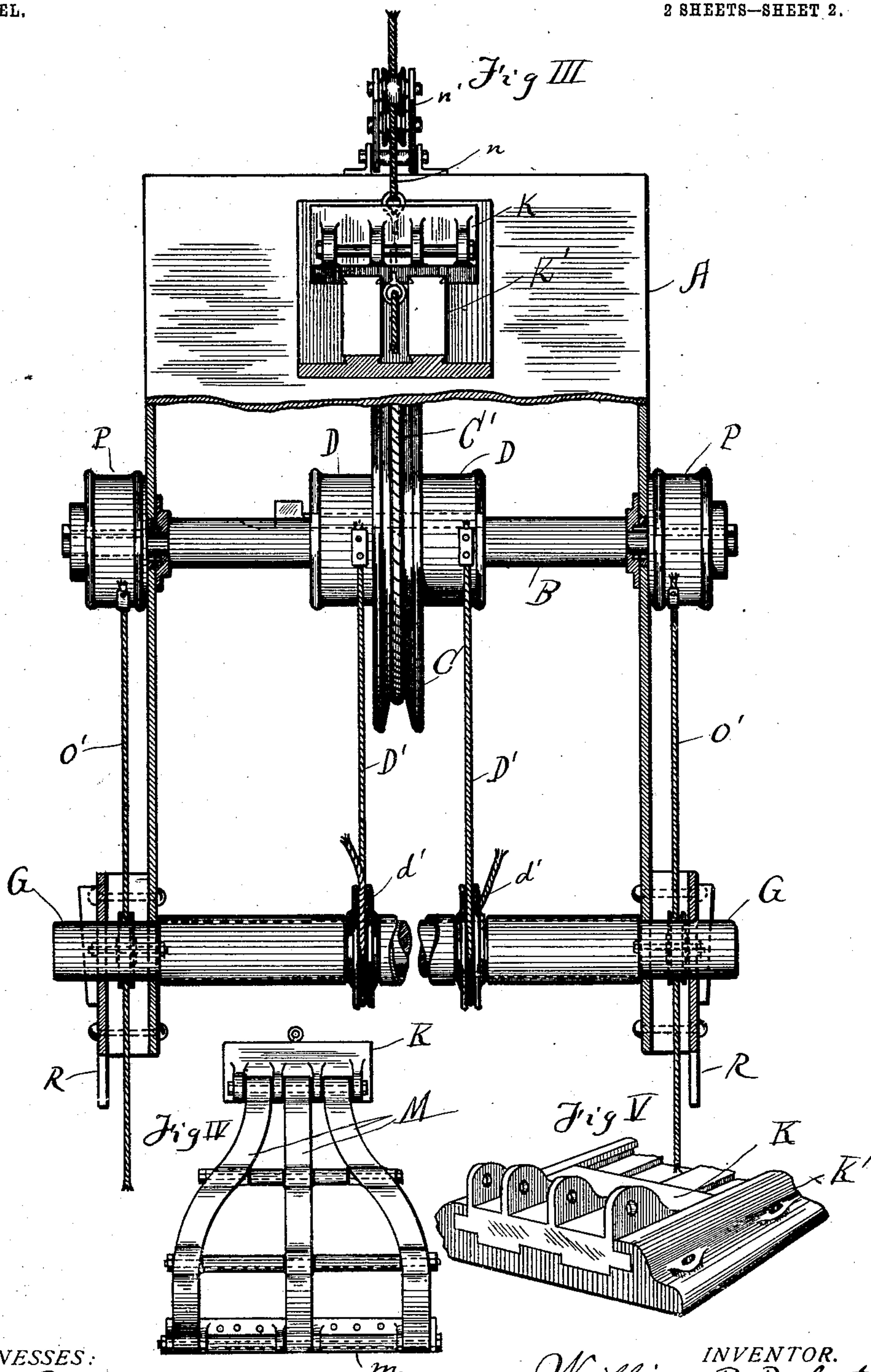
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# UNITED STATES PATENT OFFICE.

WILLIAM B. ROBERTS, OF ASHTABULA, OHIO.

## GRAB-BUCKET.

SPECIFICATION forming part of Letters Patent No. 760,250, dated May 17, 1904.

Application filed November 20, 1903. Serial No. 182,020. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. ROBERTS, a citizen of the United States, residing at Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Grab-Buckets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to automatically-operating loading and unloading buckets, generally termed "grab-buckets."

The objects of this invention are to provide a bucket of great strength, one that will present itself to the material in the proper position, one that will overcome the resistance of loading or filling it, and one that when it is loaded will retain the load without any extraordinary strain upon the operating parts.

My invention consists in parts and combination of parts whereby the above objects are attained, all of which will be hereinafter fully set forth and claimed.

In the drawings, Figure I is a view in elevation, partly in section, of a bucket constructed according to my invention and illustrating the same in its closed position. Fig. II is a view in side elevation, illustrating the bucket in open position and the relative position of the operating parts when thus opened. Fig. III is an enlarged view, in side elevation, partly in section, illustrating more clearly the drum mechanism or winding mechanism and a fragmentary view of the thrust-arm slide and the ways in which it runs along the side of the bucket. Fig. IV illustrates the preferred construction of the thrust-arm and manner of securing them both to the slide and to the sections of the bucket, and Fig. V shows a modified form of block and way for thrust-arms.

A represents the casing of the bucket, in which the drum and operative parts are located and mounted. This casing is formed, preferably, of plate metal and strengthened in any manner.

Mounted centrally in the frame A by means of roller-bearings, preferably located at each side of the casing A, is a shaft B. This shaft

B constitutes the main shaft of the bucket, and on it is mounted the power-communicating sheave C, which revolves with the shaft B and communicates motion thereto. This sheave C is operated through a cable C', which in turn passes over suitable guiding-pulleys and ways to an operating-drum, as is usual in loading and unloading machinery. This drum may be of any suitable construction and operated in any suitable manner by connection with a proper motor or engine and provided with a suitable brake. The cable C' when the bucket is open is wound around the sheave C a predetermined distance or length suitable for bringing into play the operative portion of the opening and closing mechanism connected therewith. At either side of the sheave C are drums D D, which operate in unison with said sheave C for the purpose of winding and unwinding chains or cables D' D'. The cables D' D' pass, respectively, over idle sheaves d' d', located at opposite sides and at the lower end of the frame A. The idlers d' d' are mounted upon spindles G G, respectively, the said spindles forming the hinged portion or pivotal portion of the sections J J' of the bucket, and it is thus that the sections J J' are mainly supported in the frame or casing A.

It will be noticed that the sections J J' are hinged or pivoted approximately centrally of their length, thus forming them into fulcrumed levers, the fulcrum being at the pivotal portion, where they are attached to the frame or casing A, as at G G, also that they swing toward and from each other on these pivotal portions.

These cables D' D' pass in opposite directions from the drums D D, respectively, and, as hereinabove stated, over the guiding or idle sheaves d' d', from whence they pass outside of the casing or frame A and are connected to sliding blocks K K. These sliding blocks K K run in ways or are guided at the sides of the casing A, one on either side, the ways being formed, preferably, dovetail shape, and the grooves on the under side of the blocks K are formed accordingly, leaving more or less play between the parts to avoid cramping. This construction is more clearly illustrated



in Fig. III, in the upper end of the figure K representing the sliding block and K' the way. While I prefer this construction and find it best adapted for the purpose, it may be modified and probably will be modified as found necessary or desirable. Pivottally secured to the sliding blocks K K are a pair of thrust-arms M M, one for each section J J' of the bucket. These arms M M are preferably constructed as illustrated in Fig. IV of the drawings, being formed in three sections properly braced together by stay-bolts; but this construction may also be modified.

At the lower ends the arms M M are pivottally secured to the outer upper ends of the sections J J', as at *m m*. Thus it will be noticed that as the blocks K K slide up and down on their ways they will elevate or depress the outer ends of the sections J J', thus causing the said sections to rotate on their hinged portions G G and be opened or closed accordingly. It will also be noticed that the action of the arms M M is similar to the action of a toggle joint or lever, increasing the power or thrust force as the blocks K K are lowered and as the sections J J' are digging into or loading the material. This is a great advantage in buckets of this type, where the greatest force is necessary or the greater power is required as the sections enter the material and meet with obstructions as they advance into it.

The upper ends of the blocks K K are secured, respectively, to branches *n n* of a cable N, the branches *n n* passing over or through guiding-sheaves *n' n'*, located at the upper end of the casing A. It is this cable N that operates to open the sections J J' by checking it and leaving the cable C' more or less free, the weight of the bucket uncoiling the cables D' D', allowing the blocks K K to slide upward and leaving the free ends of the buckets J J' free to open.

In lowering the bucket into the material to be loaded and also in unloading or discharging the bucket the bucket is mainly supported upon the cable N, while in loading the bucket or excavating in the material and in carrying the loaded bucket the weight is mainly supported on the cable C', which also acts to operate the sheave C and with it the drums D D and cables or chains D' D' and blocks K K, which in turn operate the arms M M, causing the sections J J' to scoop out and dig into the material and close the sections and hold them closed until ready to be discharged of their load.

As an auxiliary to the operating of the sections J J', I have found it a great help to attach at the inner upper corners, as at *o o*, cables, chains, or other means, such as O O, which in turn are secured to and operated by a chain or cable O', these appliances being attached at both sides of the sections and outside of the sections J J' and outside of the casing A at the sides thereof. The cables or

chains O' are in turn connected to drums P P, mounted on the shaft B at the outer ends thereof. Thus when the drum C is revolving, lowering the blocks K, the cables or chains O' O' are being wound on the drums C C, supporting and lifting the inner ends of the sections J J' and aiding in the closing of the same.

It will be understood that when the sheave C is free to revolve that the cables I' O' are also free. These auxiliaries aid materially in supporting the load, taking the strain off of the arms M M and the blocks K K.

It will be understood that the drums P P, as also the other drums, should be proportionate and of such contour as to take up the required motion of all the parts and should operate in unison, as any one well skilled in the art will understand.

As it sometimes happens that the sections J J' should be guided at their sides and as a means for sustaining the strain on the idlers *d d*, I have placed at each side on the lower edge on the casing A a reinforcement or fillet R, which extends slightly, so as to embrace or support the upper edges of the bucket-sections when the same are closed, thus keeping them from being strained and guiding them into proper closed position.

In setting forth my invention I have illustrated and described certain constructive features and certain assemblages as I consider them best adapted to perform their functions in the type of bucket set forth; but it is apparent that certain modifications can and will be made to accommodate the bucket to different grades of material to be operated upon and that also the contour of the sections may be altered accordingly. Hence I do not wish to be limited or to limit my invention in this respect.

What I claim is—

1. A bucket of the type set forth comprising two sections hinged approximately at their central portion arms connecting the outer portions respectively of both sections, said arms being pivottally attached to the outer ends of said sections in combination with sliding blocks secured to the casing of the bucket at its sides and means for moving said blocks substantially as and for the purpose set forth.

2. A bucket of the type set forth comprising a sectional bucket formed in two parts pivottally secured at approximately their central portion to a casing, means secured to the outer parts of both the said sections for closing said sections, said means comprising pivoted thrust-arms and mechanism for operating said arms, substantially as and for the purpose set forth.

3. A bucket of the type set forth comprising two pivoted sections adapted to grasp and retain the load, said sections being pivoted to a casing midway of their length thrust-arms secured to the outer ends of the sections and to the casing respectively with means for op-



erating said thrust-arms for the purpose of closing and opening said sections, substantially as and for the purpose set forth.

5 4. A bucket of the type set forth comprising a casing pivoted sections secured to said casing at or near the lower outer ends of said casing and midway of the length of said sections with means for opening and closing said sections said means comprising thrust connections with the outer upper ends of said sections, operating through suitable cables, substantially as and for the purpose set forth.

10 5. A bucket of the type set forth comprising a frame or casing means contained within said frame or casing, adapted to be operated by one of the suspending-cables, bucket-sections pivotally connected to the lower outer ends of said casing midway of the length of said sections, thrust-arms pivotally connected  
20 with the outer ends of the sections at one end of said thrust-arm, and connected to sliding blocks at the other end, with ways upon which said blocks travel, and means for oper-

ating said blocks, substantially as and for the purpose set forth.

25 6. A bucket of the type set forth, comprising pivoted sections connected to the supporting cable or frame, midway of their length, thrust arms or mechanism adapted to depress the outer portion of said sections, means for  
30 operating said depressing devices, and an auxiliary closing device secured to the upper inner edges of the sections with means for operating the latter device so as to work in unison with the depressing devices for the purpose  
35 of closing and supporting the sections, substantially as and for the purpose set forth.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio, this 18th day of November, 1903.

WILLIAM B. ROBERTS.

Witnesses:

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