

No. 611,357.

Patented Sept. 27, 1898.

J. DEMBINSKI.
DREDGING BUCKET.

(Application filed Mar. 22, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

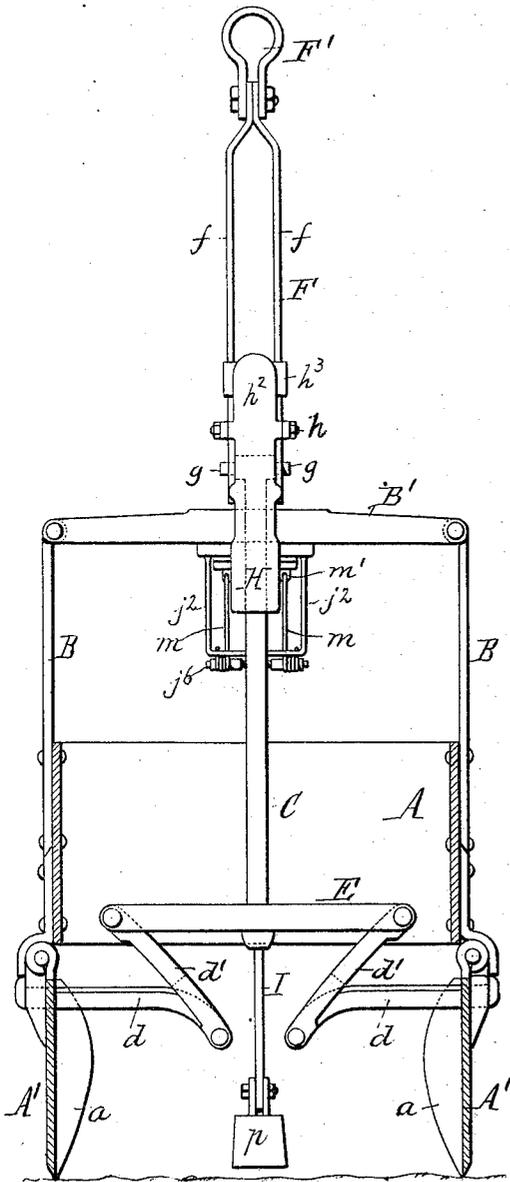
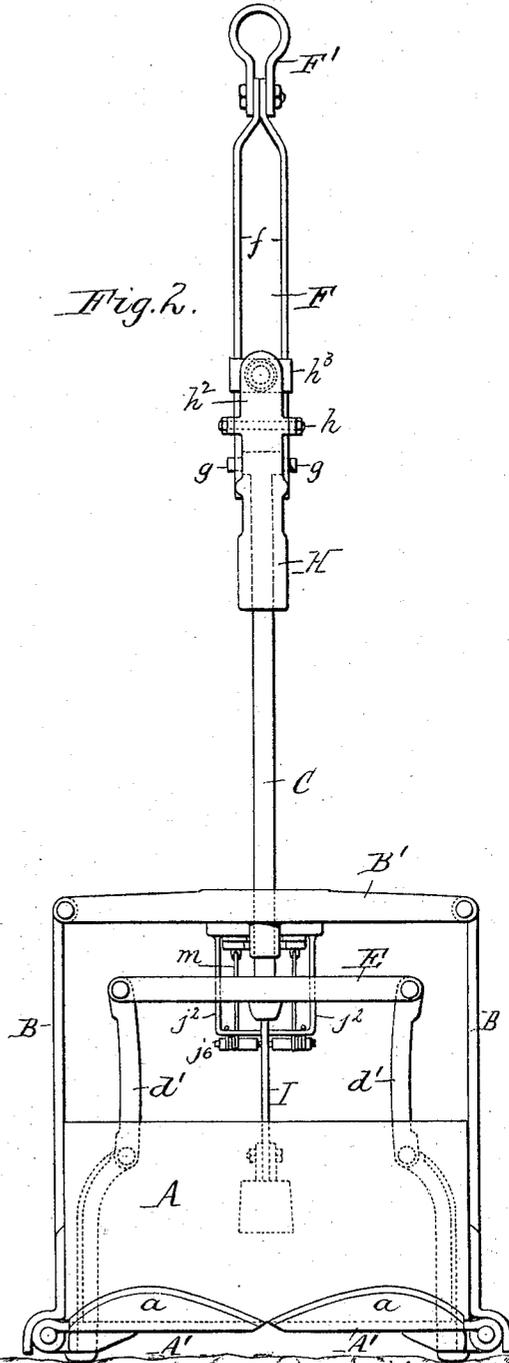


Fig. 2.



Witnesses:

Chas. F. Burkhardt
Henry L. Deck

Joseph Dembinski Inventor.
By Wilhelm P. Pomeroy
Attorneys.

No. 611,357.

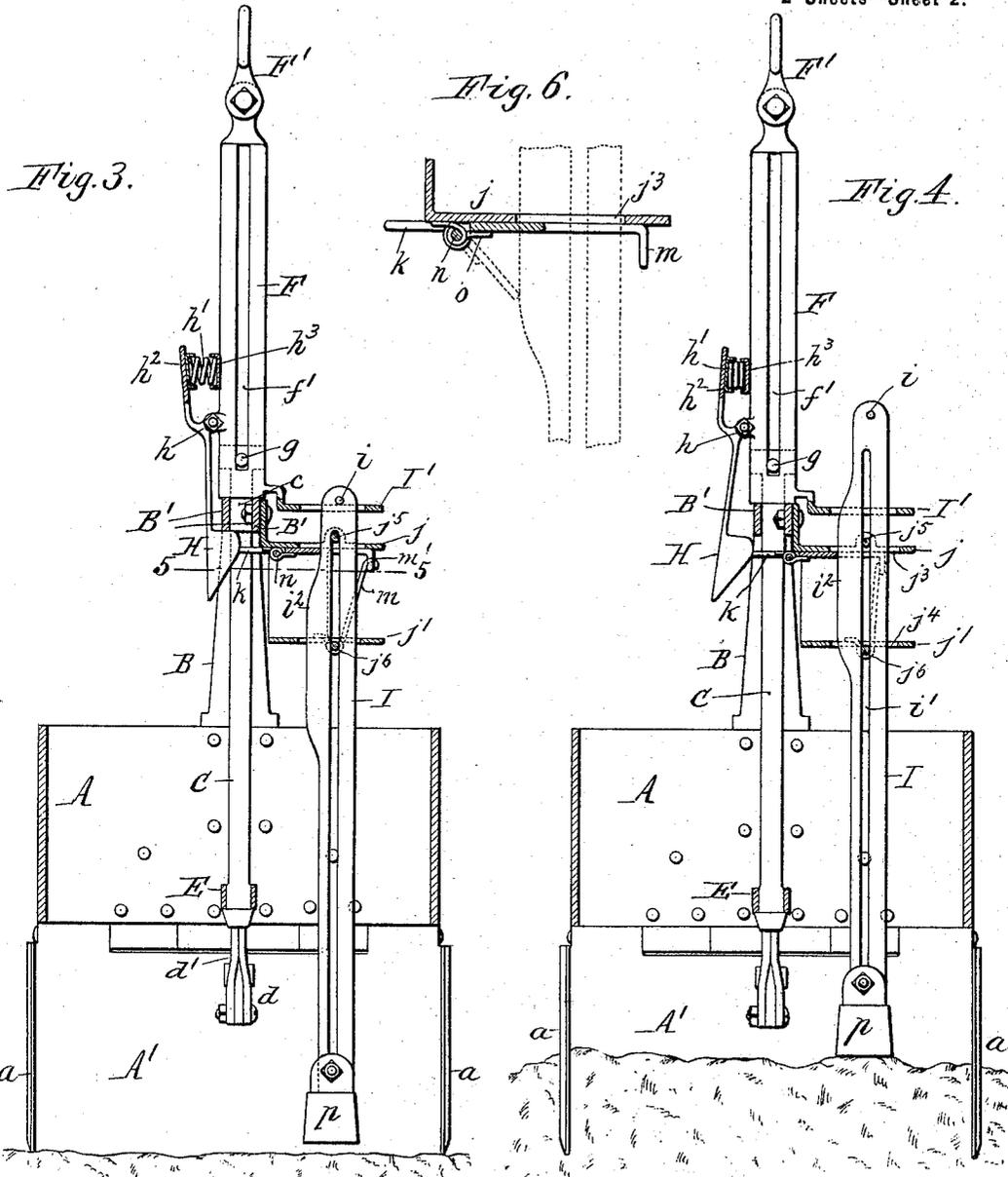
Patented Sept. 27, 1898.

J. DEMBINSKI.
DREDGING BUCKET.

(Application filed Mar. 22, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

Chas. F. Burkhardt
Henry L. Deck.

Joseph Dembinski
Inventor:

By Wilhelm H. Hornet.
Attorneys.

UNITED STATES PATENT OFFICE.

JOSEPH DEMBINSKI, OF BUFFALO, NEW YORK.

DREDGING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 611,357, dated September 27, 1898.

Application filed March 22, 1898. Serial No. 674,739. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH DEMBINSKI, a subject of the Emperor of Russia, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Dredging-Buckets, of which the following is a specification.

This invention relates to the general class of dredgers consisting of a bucket having a hinged or dumping bottom and means for locking the same in its closed position, and more especially to a dredger or hoisting-bucket designed to remove soft or loose material from the bed of a stream or loose material excavated from a sewer or other trench and having hinged bottom-sections which close upon the material to be removed and scoop the same in the bucket.

My invention has for its object to provide the bucket with reliable means for automatically releasing its bottom-sections or scoops for discharging the hoisted load, as well as automatic means for closing and locking the bottom-sections when the bucket is lowered, so as to load and discharge the bucket automatically.

In the accompanying drawings, consisting of two sheets, Figure 1 is a front elevation of my improved dredger, partly in section, showing the bottom-sections open. Fig. 2 is a front elevation thereof, showing the bottom-sections closed. Fig. 3 is a vertical central section of the dredger at right angles to Fig. 1, showing the position of the parts when the bottom-sections are open. Fig. 4 is a similar section showing the locking-catch of the sliding hanger tripped preparatory to the automatic closing of the bottom. Fig. 5 is an enlarged horizontal section in line 5 5, Fig. 3, looking upward. Fig. 6 is an enlarged vertical longitudinal section of the slide which releases the locking-pawl of the hanger.

Like letters of reference refer to like parts in the several figures.

A is the rectangular body of the bucket, and A' are the sections of its dumping-bottom, which are hinged at their outer edges to the lower end of the bucket, at opposite sides thereof, so as to be capable of swinging into the closed horizontal position shown in Fig. 2 or the open depending position shown in Figs. 1, 3, and 4. Each of these bottom-sections

is provided at its ends with knives or cutters *a*, which project upwardly or inwardly at right angles to the sections and which serve to sever the material scooped up by the sections from the adjacent material, thus facilitating the closing of the bottom. These knives extend across the entire width of the sections and overlap the adjacent sides of the bucket when the bottom is closed. They are preferably provided with a curved cutting edge, as shown in Figs. 1 and 2.

The bucket is provided above its upper end with a suspension-yoke consisting, preferably, of a pair of upwardly-extending arms B, rigidly secured at their lower portions to opposite sides of the bucket, and a pair of horizontal bars B', secured at their ends to the upper ends of said arms.

C is a vertically-sliding bar or bottom-operating rod which is guided in a socket *c*, arranged centrally on the bucket-yoke, and whereby the hinged bottom-sections or scoops are closed and held in that position. Each bottom-section is provided on the inner side of the bucket, near its hinge, with an upwardly and inwardly extending actuating-arm *d*, which is rigidly secured to the sections. The upper ends of these arms are connected by upright links *d'* with opposite ends of a cross-head E, secured centrally to the lower end of the operating-rod C, so that when this rod is elevated relatively to the bucket the bottom-sections are swung upwardly and inwardly by the links *d'* and arms *d* until they close against the lower end of the bucket, while the sections are allowed to swing open by gravity when the operating-rod C is permitted to descend.

F is a hanger arranged on the operating-rod C and provided at its upper end with a clevis F' or other device for attaching it to a suitable hoisting-tackle. This hanger has a sliding connection with the operating-rod C and is adapted to act directly for keeping the bottom-sections closed or to be coupled to the yoke of the bucket for relieving the operating-rod from the weight of the bucket and its contents and allowing the bottom-sections to open by their own gravity and the weight of the load. In the construction shown in the drawings the hanger consists of a pair of upright parallel bars *f*, which are attached to

the operating-rod C by horizontal pins or studs *g*, projecting from opposite sides of said rod and arranged in vertical slots *f'*, formed in said hanger-bars. This pin-and-slot connection permits the hanger to slide on the operating-rod within certain limits without affecting the rod; but as soon as the lower ends of the slots *f'* strike the pins *g* during the upward movement of the hanger the rod is compelled to rise with the hanger. The hanger when allowed to slide downward with the operating-rod C is connected with the yoke of the bucket by an automatic catch or coupling H, consisting, preferably, of a depending pawl pivoted to the lower portion of the hanger by a horizontal pin *h*, as shown in Fig. 3. The pawl H is pressed inwardly for holding it in engagement with the bucket-yoke by a spring *h'*, interposed between an upwardly-extending arm *h*² of the pawl, and a cross-bar *h*³, secured to the hanger. When the hanger descends on the operating-rod, the inclined nose of the pawl rides over the bucket-yoke, and as soon as the shoulder of the pawl arrives below the bucket-yoke it interlocks automatically with the same in an obvious manner. The slots of the hanger extend slightly below the pins *g* of the operating-rod when the pawl H is interlocked with the bucket-yoke, as shown in Fig. 3, so that the upward pull of the hanger is exerted only on the bucket-yoke.

I is a trip or releasing device whereby the locking-pawl H is automatically disengaged from the bucket-yoke when the bucket is lowered for loading it. This trip preferably consists of a vertically-sliding bar which extends through the bucket and is suspended by a cross-pin *i* from a lug or bracket I', secured to the lower portion of the hanger and having a slot through which the trip-bar passes, as shown in Figs. 3 and 4. The trip-bar is further guided in a bracket secured to the yoke of the bucket and composed of upper and lower plates *j*¹, which are connected by upright bars *j*². The trip-bar passes through slots *j*³ *j*⁴, formed in said bracket-plates, and is compelled to move in a vertical line by transverse rods or pins *j*⁵ *j*⁶, secured to said plates and passing through a vertical slot *i'*, formed in the trip-bar and extending nearly from end to end thereof. The trip-bar is so long that when it is in its lowermost position and the bottom-sections of the bucket are open the bar extends to about the lower edge of the open sections, so that upon lowering the bucket the lower end of the trip-bar strikes the ground and is pushed upward in its brackets.

k is a horizontal slide or releasing plate arranged on the bracket-plate *j* immediately below the bucket-yoke and adapted to push the pawl H out of engagement with the bucket-yoke. The rear end of this slide is arranged in the path of a cam *i*², arranged on the opposing edge of the trip-bar I, so that when the latter is tripped its cam forces the slide forwardly, causing the latter to unlock the pawl H, as shown in Fig. 4. The slide is normally

retracted out of the way of the locking-pawl by springs *m*, coiled around the pin *j*⁶ of the lower bracket-plate *j'* and bearing with their lower branches against said plate and with their upper branches against lugs *m'* of the slide. In order to prevent the slide from being actuated during the descent of the trip-bar I, the portion thereof against which the cam of the bar engages is jointed to the main portion of the slide by a horizontal pin *n*, and this jointed portion or tongue is free to yield downwardly as the cam of the trip-bar rides over it, but is prevented from swinging upward beyond a horizontal position by contact with the under side of the plates *j*. This jointed portion of the slide is held in its normal position by a spring *o* of any suitable construction, that shown in the drawings consisting of a piece of spring-wire coiled around the pivot of the section and bearing with its branches against the under side of the slide and its jointed portion, as shown in Figs. 3, 4, and 6.

The trip-bar is preferably provided at its lower end with a weight *p* for insuring its descent when the hanger slides downward on the operating-rod C.

The operation of my improved dredger is as follows: When the empty bucket is in its elevated position preparatory to being lowered, the bucket-yoke is suspended from the hanger F by means of the pawl or catch H, which latter is interlocked with the bucket-yoke, as shown in Figs. 1 and 3, while the hinged bottom-sections of the bucket hang in their open position and the operating-rod C is in its lower position. The trip-bar I is also in its depressed position and extends downward to about the lower edges of the open bottom-sections, and the slide *k* is in its retracted position. Upon lowering the bucket to the bottom of the stream or trench the depending bottom-sections or scoops penetrate the soft bed or mass of loose material and the lower end of the trip-bar is at the same time pushed upward by contact with the ground, causing its cam to shift the slide forward against the locking-pawl and tripping the latter out of engagement with the yoke of the bucket. When the scoops have penetrated the ground to a sufficient depth to fill the bucket on closing, the bucket is elevated by the hoisting-tackle, which causes the lower ends of the hanger-slots *f'* to come in contact with the pins *g* at the upper end of the operating-rod C, thus transferring the point of suspension of the bucket from its yoke to the operating-rod C. This rod is now drawn upward by the ascending hanger, thus closing the bottom-sections through the medium of the links *d* and arms *d'* and scooping the material between the sections into the bucket. While the sections or scoops are closing, the body of the bucket, being detached from the hanger, descends by gravity until its lower end meets the closing sections, when the further descent of the bucket is arrested and

the same and its contents are elevated with the ascending hanger, the entire load being suspended from the operating-rod C while the bucket is being raised. The cam of the trip-bar is of such length that it not only unlocks the pawl H when the bar strikes the ground, but keeps the pawl unlocked while the scoops sink into the ground for taking a full load. As the trip-bar unlocks the pawl as soon as it comes in contact with the ground, the bucket may take either a partial load or a full one. After conveying the hoisted bucket to the desired place of deposit by the swinging crane or other conveyer the same is lowered to the ground, and as soon as the bucket reaches the ground the engineer allows the hoisting-tackle to slacken. This permits the hanger to slide downward on the operating-rod and causes its automatic catch H to interlock with the bucket-yoke, as shown in Figs. 1 and 3. The point of suspension of the bucket is thereby transferred from the operating-rod C to the bucket-yoke, releasing the rod and the bottom-section. The bucket is now raised a short distance above the ground by the hoisting-tackle, whereupon the released bottom-sections swing open under the weight of the material resting thereon, thus discharging the contents of the bucket. The downward movement of the hanger allows the trip-bar to descend by gravity to its former position ready to again trip the locking-catch H during the next descent of the bucket. As the trip-bar is suspended from the vertically-movable hanger it rises with the same when the bottom-sections are closed and clears the same, as shown by dotted lines in Fig. 2.

It will be observed that by my improved mechanism the hinged bottom-sections or scoops are not only closed automatically for loading the bucket, but are also opened automatically for discharging the contents, thus dispensing with an attendant for unlocking the bottom and effecting a corresponding saving in the cost of operating the dredger.

I claim as my invention—

1. The combination with a bucket having movable bottom-sections hinged at their outer edges to the lower end of the bucket, of an upright rod provided with a stop and having its lower end connected with said bottom-sections on the inner sides of the hinges of the sections, whereby the sections are closed against the lower end of the bucket when said rod is raised and allowed to swing into a pendent position when the rod descends, a hanger sliding on said rod and adapted to engage against the stop thereof for elevating the rod and closing the bottom-sections, and a catch whereby said hanger is coupled to the body of the bucket when said rod is lowered, substantially as set forth.

2. The combination with a bucket having a movable bottom or scoop, of an operating device connected with said bottom or scoop for closing the same, a vertically-movable

hanger having a sliding connection with said bottom-operating device, a catch or coupling arranged to connect said hanger with the body of the bucket, and a trip device arranged to strike the ground when the bucket is lowered and operating to disengage said catch from the bucket, substantially as set forth.

3. The combination with a bucket having downwardly - swinging bottom - sections or scoops pivoted to the bucket at their outer edges and each provided with a rigid actuating-arm extending upwardly from its inner side, of a vertically-movable operating-rod extending into the bucket and provided at its lower end with a cross-head, and links connecting said arms with opposite ends of said cross-head, substantially as set forth.

4. The combination with a bucket having downwardly - swinging bottom - sections or scoops pivoted to the bucket at their outer edges and each provided within the bucket with a rigid upwardly-extending arm, of a vertically-movable operating-rod extending above the bucket and provided at its lower end with a cross-head, links connecting said arms with said cross-head, and a hanger arranged to be coupled either to said operating-rod or to the body of the bucket, substantially as set forth.

5. The combination with a bucket having a yoke and a movable bottom or scoop, of an operating-rod connected with said bottom and extending upwardly therefrom, a vertically-movable hanger having a sliding connection with said operating-rod, an automatic catch carried by said hanger and adapted to interlock with the bucket-yoke, when the hanger is lowered on the operating-rod, and a trip device for disengaging said catch from the bucket-yoke, substantially as set forth.

6. The combination with a bucket having a yoke and a movable bottom or scoop, of an operating-rod connected with said bottom and extending upwardly therefrom, a vertically-movable hanger having a sliding connection with said operating-rod, an automatic catch carried by said hanger and adapted to interlock with the bucket-yoke, when the hanger is lowered, a vertically-movable trip-bar adapted to strike the ground when the bucket is lowered and provided with a cam, and a slide operated by said cam and arranged to disengage said catch from the bucket-yoke, substantially as set forth.

7. The combination with a bucket having a yoke and a movable bottom or scoop, of an operating-rod connected with said bottom and extending upwardly therefrom, a vertically-movable hanger having a sliding connection with said operating-rod, an automatic catch carried by said hanger and adapted to interlock with the bucket-yoke, when the hanger is lowered, a slide mounted on the bucket-yoke and arranged to trip said catch out of engagement with the bucket-yoke, a spring for retracting said slide, and a vertically-movable trip-bar connected with said hanger

and having a cam which operates against said slide, substantially as set forth.

8. The combination with the bucket having a yoke and a movable bottom or scoop, of an
5 operating-rod connected with said bottom and extending upwardly therefrom, a vertically-movable hanger having a sliding connection with said operating-rod, an automatic catch carried by said hanger and adapted to inter-
10 lock with the bucket-yoke when the hanger is lowered, a vertically-movable trip-bar connected with said hanger and having a cam,

and a slide arranged to trip said catch out of engagement with the bucket-yoke and having a downwardly - yielding tongue or portion against which the cam of said trip-bar operates, substantially as set forth.

Witness my hand this 8th day of March, 1898.

JOSEPH DEMBINSKI.

Witnesses:

BEONIS FARVA DEMBINSKI,
THEO. L. POPP.