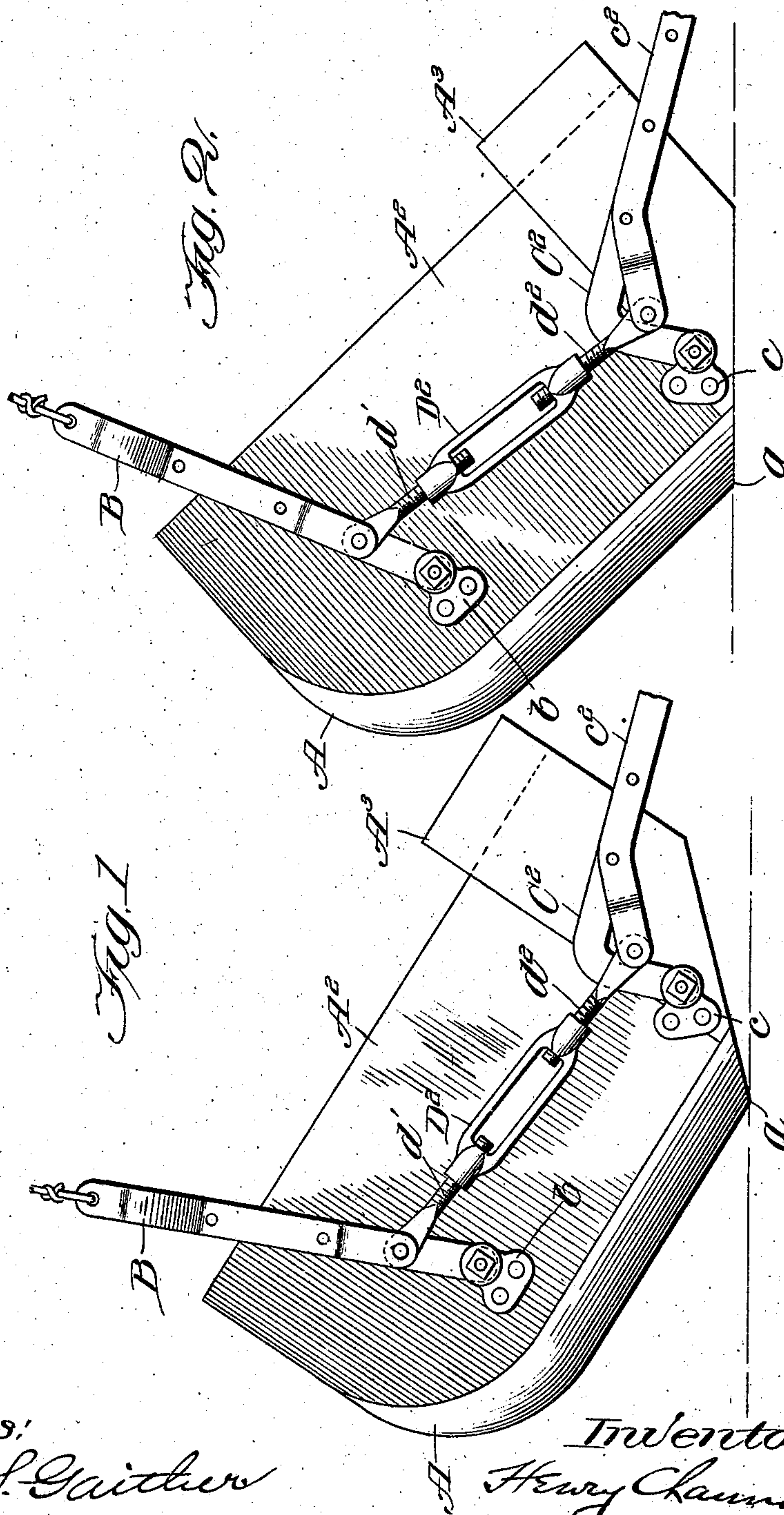


No. 867,947.

PATENTED OCT. 15, 1907.

H. CHANNON.
EXCAVATING SHOVEL.
APPLICATION FILED JAN. 8, 1907.

2 SHEETS—SHEET 1.



Witnesses:
Harry S. Gaither
Ruby V. Nash.

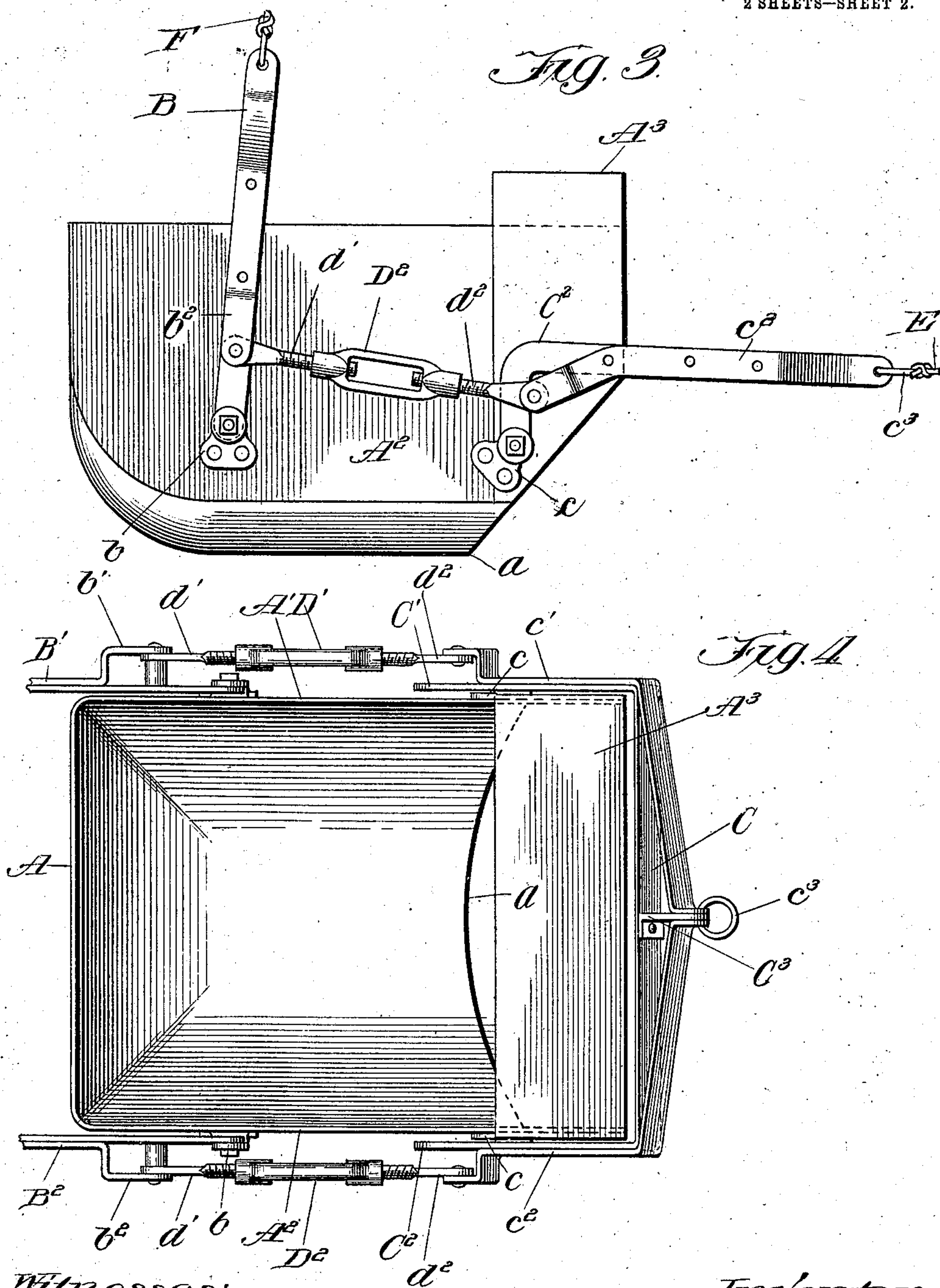
Inventor:
Henry Channon
by Samuel Wilkinson
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UNITED STATES PATENT OFFICE.

HENRY CHANNON, OF CHICAGO, ILLINOIS.

EXCAVATING-SHOVEL.

No. 867,947.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed January 8, 1907. Serial No. 351,299.

To all whom it may concern:

Be it known that I, HENRY CHANNON, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Excavating-Shovels, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to excavating apparatus and more particularly to excavating shovels.

In the work of excavating it is necessary that the shovel should be forced into the material until filled, then held in position to retain the material therein while being moved to a position over the spoil pile, and then permitted to dump the material therefrom. When the material is hard, such as clay, the inclination of the bottom of the bucket when digging should be greater than when the material is soft or granular, such as sand, in order that the cutting edge of the bucket may be forced into the material. When the material is hard it is less apt to fall from the bucket than when soft, consequently the bottom of the bucket may be more inclined while being moved to a position over the spoil pile when the material is hard than when it is granular or soft.

The primary object of my invention is to provide an improved excavating shovel which may be so adjusted as to vary the inclination of the bottom thereof when in digging position according to the character of the material worked upon.

A further object of my invention is to provide an improved excavating shovel which may be readily loaded with material, which may be securely held in position to retain the material thereon when loaded, and which may be easily dumped when above a point where the material is to be deposited.

A still further object of my invention is to provide an excavating shovel which will be simple in construction, inexpensive in manufacture, and efficient in use.

The embodiment of my invention herein disclosed may be generally described as comprising a shovel, a supporting bail between the arms of which the shovel is pivotally supported at the rear of its center of gravity, bell-crank levers on the opposite sides of the shovel, one arm of each lever being pivoted to the shovel, links connecting the bell-crank levers adjacent their angles with the sides of the bail above their points of pivotal connection with the bucket, means for adjusting the lengths of the links, and hauling mechanism connected with the other arms of the bell-crank levers.

My invention will be more fully described herein-after with reference to the accompanying drawings in which the same is illustrated as embodied in a convenient and practical form, and in which

Figure 1 is a side elevational view showing the bucket in position to dig soft or granular material; Fig. 2 a view similar to Fig. 1 showing the bucket adjusted for digging hard material; Fig. 3 a side elevational view showing the bucket as adjusted in Fig. 1 when filled with material; and Fig. 4 a front elevational view showing the bucket in dumping position.

The same reference characters are used to designate the same parts in the several figures of the drawings.

Reference letter A indicates an excavating shovel of any desired size and shape and made of any suitable material. The bucket is preferably made of sheet metal and comprises side walls A' and A^2 and a curved bottom wall having a cutting edge a at the front thereof. In order to impart strength to the front of the shovel it is provided with a hood A^3 comprising side portions riveted to the outer surfaces of the side walls of the shovel and an intermediate integral portion extending across the front of the shovel.

B designates a bail for supporting the shovel between the ends of which the shovel is pivotally mounted. The ends of the bail extend between ears b and the adjacent side walls of the shovel. Bolts extend through registering holes in the ears b , lower ends of the bail, and adjacent side walls of the shovel. Reinforcing braces B' and B^2 are preferably secured to the side portions of the bail and are united at their upper conveying ends to which a supporting cable F is secured.

Bell-crank levers C' and C^2 are pivotally secured to the side walls of the shovel near the front thereof. Brackets c , c are secured to the outer surfaces of the side walls of the shovel between which and the side walls of the shovel the lower ends of the bell-crank levers are fulcrumed by means of bolts or pins. The opposite arms of the bell-crank levers are united by a bail C preferably formed integrally with the levers. Reinforcing braces c' and c^2 are preferably secured to the bell-crank levers and are united at their converging ends by a strut C^3 to the bail C. Suitable hauling means, such for instance as a cable E is secured to the united ends of the braces in any suitable manner, as by means of a ring c^3 .

A link D' comprising a turn buckle and oppositely screw-threaded rods d' and d^2 , is pivotally secured at one end to a bracket on the bell-crank lever C' , such bracket being conveniently formed by bending outwardly the lower end of the brace c' . The opposite end of the link is pivotally connected to the corresponding side of the bail B in any suitable manner, as by pivoting the same between a bracket b' and the adjacent portion of the bail. The bracket b' may be conveniently formed by bending outwardly the lower end of the brace B' . A link D^2 similar to link D' , pivotally connects the bell-crank lever C^2 with the corresponding side of the bail B. The link D^2 comprises a turn-buckle connecting oppositely screw-

threaded rods one of which d' is pivotally supported between a bracket b^2 and the adjacent portion of the bail B. The bracket b^2 may be conveniently formed by bending outwardly the lower end of the brace B^2 of the bail B. The screw-threaded rod d^2 is pivotally connected to a bracket secured to the bell-crank lever C^2 and preferably formed by bending outwardly the lower end of the reinforcing brace c^2 on the bail C.

The operation of my improvement is as follows: The bucket is located at a point from which the material is to be removed, by means of the lifting cable F which depends from a derrick, crane or other supporting mechanism. The shovel or bucket is then moved horizontally by power applied to the hauling cable E which is operatively connected to a windlass or other power device. The horizontal movement of the shovel causes the cutting edge thereof to dig into the earth or other material, thereby filling the shovel. After the shovel has been filled the tension on the hauling cable E is increased so that the bucket assumes a substantially horizontal position, such as shown in Fig. 3, owing to the links which connect the bell-crank levers with the supporting bail. The bucket while held in a substantially horizontal position may be moved to the desired point where the material is to be deposited. The tension on the hauling cable E is then discontinued, permitting the bucket to swing relatively to the bail to the position shown in Fig. 4 when the material will at once fall from the bucket. It is obvious that when the bucket is in the substantially horizontal position shown in Fig. 3 it can not oscillate between the arms of the bail B without the ends of the links D' and D^2 pivoted thereto moving towards the rear of the bucket. Such rearward movement of the links is prevented as long as the bell-crank levers are retained in the position shown in Fig. 3 by the tension of the cable E. When, however, the pull on the hauling cable E is discontinued the bell-crank levers are permitted to oscillate rearwardly and permit the links to move towards the back of the bucket, thereby permitting the bucket to swing downwardly and discharge the material therefrom. The inclination of the bottom of the bucket may be varied by adjusting the length of the links D' and D^2 which may be readily accomplished by means of the turn-buckles. When the material to be shoveled is soft or granular the links are lengthened so that the inclination of the bottom wall of the bucket is comparatively slight, as indicated in Fig. 1. When, however, the material to be shoveled is of a character to resist the penetration thereof by the cutting edge of the bucket, the inclination of the bottom wall should be greater which is accomplished by shortening the links D' and D^2 through the medium of the turn buckles. In Fig. 2 I have shown the links shortened so as to give a greater inclination to the bottom wall of the bucket. When the links are so adjusted as to give a comparatively slight inclination to the bottom of the bucket when in its digging position, the bottom of the bucket will, when in position to retain the material thereon, occupy a horizontal position as shown in Fig. 3, while the bottom wall of the bucket when carrying the material will be inclined slightly, when the links are of a length to increase the inclination of the bottom of the bucket as shown in Fig. 2. The granular or soft

material is more liable to fall from the bucket when being carried thereby, consequently it is desirable that the bottom thereof should be in a horizontal position, while the danger of a material of a harder character, such as clay, falling from the bucket when being carried is less so that the bottom wall may be slightly inclined when in its carrying position. The adjustment of the links therefore, while increasing the efficiency of the digging capacity of the bucket does not impair the capacity of the bucket for carrying the material.

The cable E, bail C, bell-crank levers C' and C^2 , and links D and D^2 , constitute the pulling mechanism by means of which the bucket is hauled horizontally and loaded with material.

From the foregoing description it will be observed that I have invented an improved excavating shovel or bucket, which though simple in construction may be readily loaded with material, and when loaded will be securely held in position to carry the load to the point where the material is to be discharged, and which may be adjusted according to the character of the material which is to be shoveled, thereby increasing the efficiency of the bucket.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts and the substitution of equivalents, as circumstances may suggest, or render expedient without departing from the spirit of my invention.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, the combination with an excavating shovel, of a supporting member pivotally supporting said shovel, means for forcing said shovel into the material, and means for varying the inclination of the shovel when digging according to the character of the material worked upon.
2. In a device of the character described, the combination with an excavating shovel, of a supporting member pivoted to said shovel, hauling mechanism engaging said supporting member and connected to the shovel, and means for adjusting the hauling mechanism to vary the inclination of the shovel when digging according to the character of the material worked upon.
3. In a device of the character described, the combination with an excavating shovel, of a supporting member pivoted to said shovel at the rear of its center of gravity, hauling mechanism secured to said supporting member and connected to the shovel at the front of its center of gravity, and means for adjusting the hauling mechanism to vary the inclination of the shovel when digging according to the character of material worked upon.
4. In a device of the character described, the combination with a shovel, of a supporting bail between the arms of which said shovel is pivoted at the rear of its center of gravity, pulling mechanism secured to the portions of said bail on the opposite sides of the shovel, said mechanism being connected to each side of the shovel at the front of its center of gravity, and means for adjusting the hauling mechanism to vary the inclination of the shovel when digging according to the character of the material worked upon.
5. In a device of the character described, the combination with a shovel, of a supporting bail to the arms of which said shovel is pivoted at the rear of its center of gravity, a lever pivotally connected to said shovel in front of said bail, a link pivotally connecting said bail and lever, means for adjusting the length of said link, and means connected to said lever to which the hauling power is applied.
6. In a device of the character described, the combina-

tion with a shovel, of a supporting bail between the arms of which said shovel is pivoted at the rear of its center of gravity, a bell-crank lever pivotally connected to said shovel in front of said bail, a link pivotally uniting said
5 bail and lever, means for adjusting the length of said link, and means connected to said lever by means of which hauling power is applied.

7. In a device of the character described, the combination with a shovel, of a supporting bail between the arms
10 of which said shovel is pivoted, at the rear of its center of gravity, a bell-crank lever on each side of said shovel fulcrumed thereon at the end of one arm thereof, a link

pivotally connecting each bell-crank lever adjacent its angle to the corresponding arm of said bail, means for adjusting the length of said links and means connected to
15 the other arms of said bell-crank levers for applying hauling power to the shovel.

In testimony whereof, I sign this specification in the presence of two witnesses.

HENRY CHANNON.

Witnesses:

GEO. L. WILKINSON,
HARRY S. GAITHER.