(No Model.) 2 Sheets—Sheet 1.

C. G. PETERSON & C. V. RUNDBLAD.

EARTH SCRAPER.

No. 376,753. Patented Jan. 24, 1888.

Fig. 1.

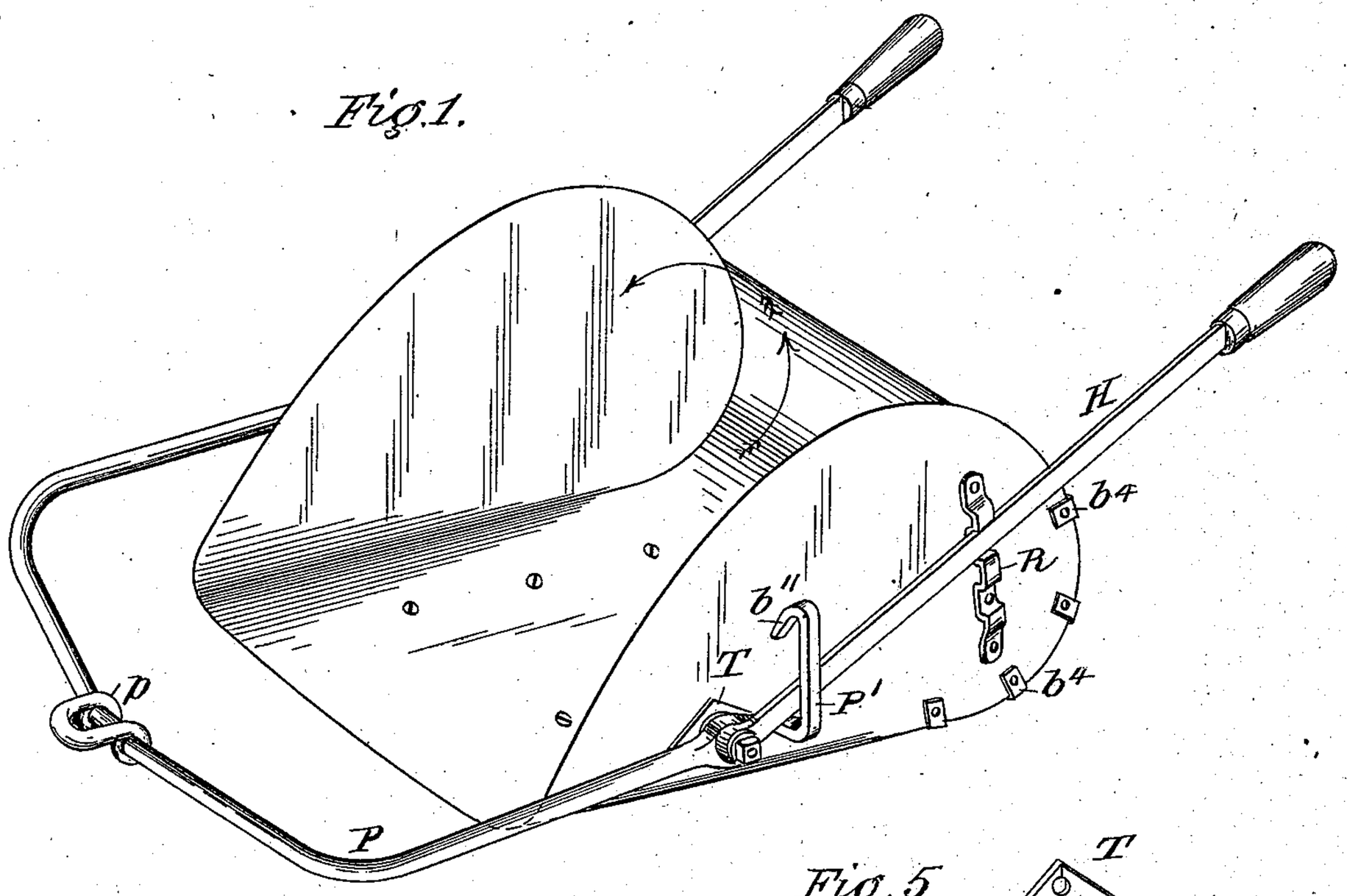


Fig. 5

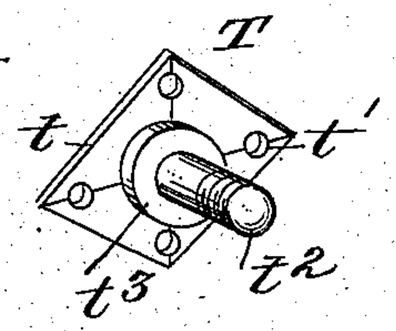


Fig. 4

Fig. 6.

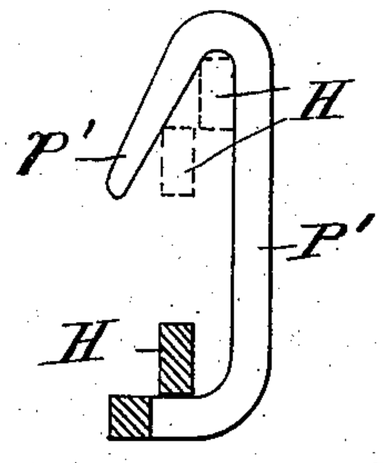


Fig. 7.

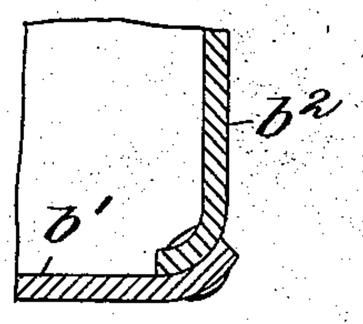


Fig. 8.

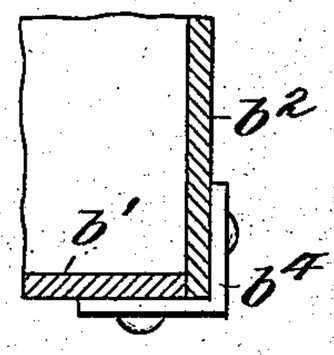
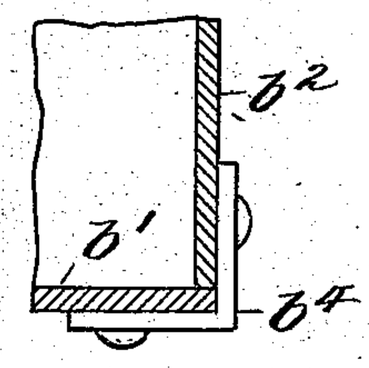


Fig. 9.



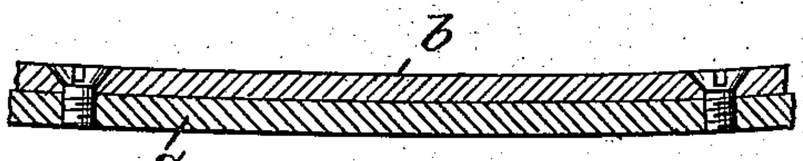


Fig. 10

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(No Model.) 2 Sheets—Sheet 2.

C. G. PETERSON & C. V. RUNDBLAD.

EARTH SCRAPER.

No. 376,753. Patented Jan. 24, 1888.

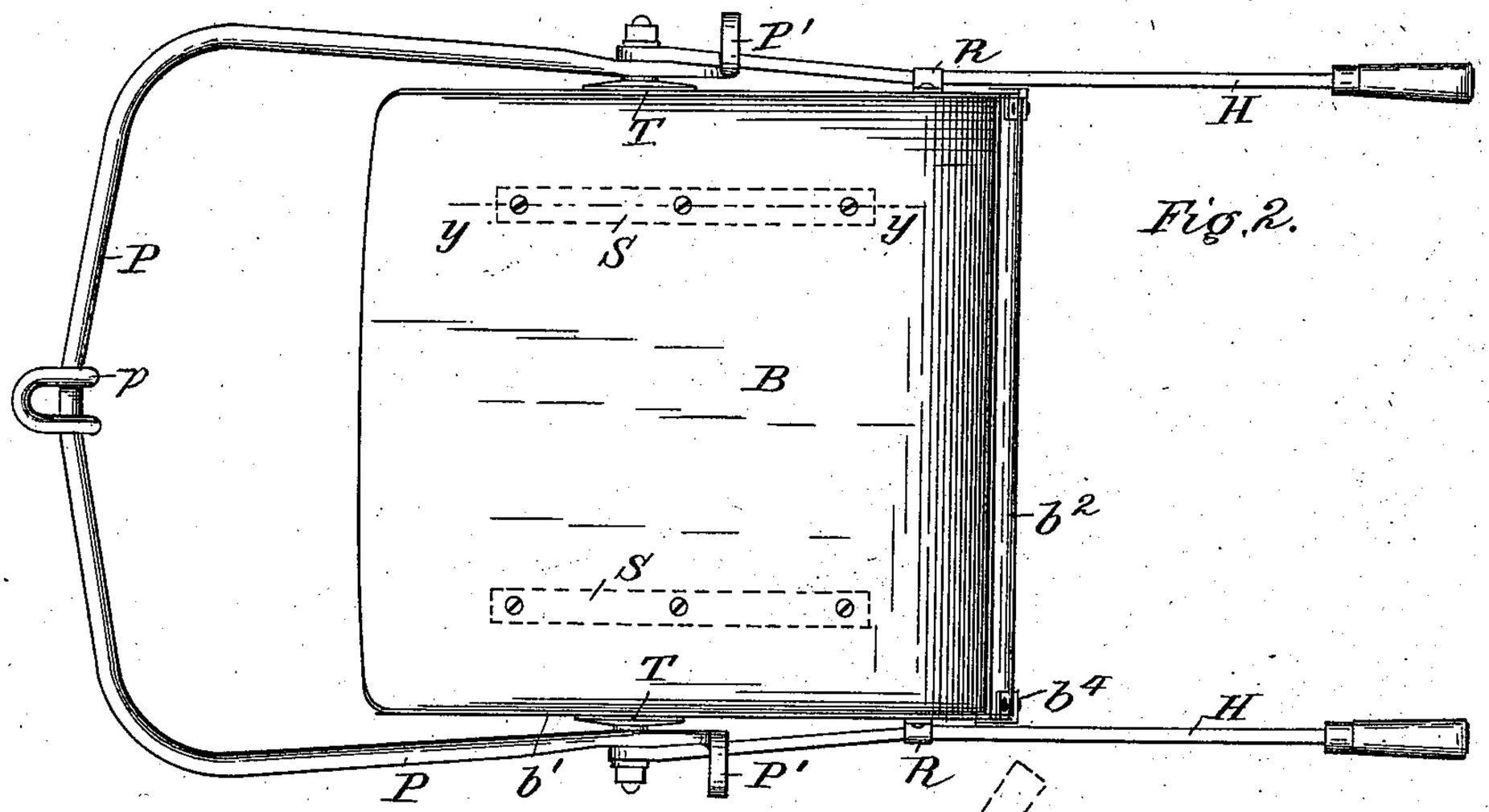

Fig. 2.

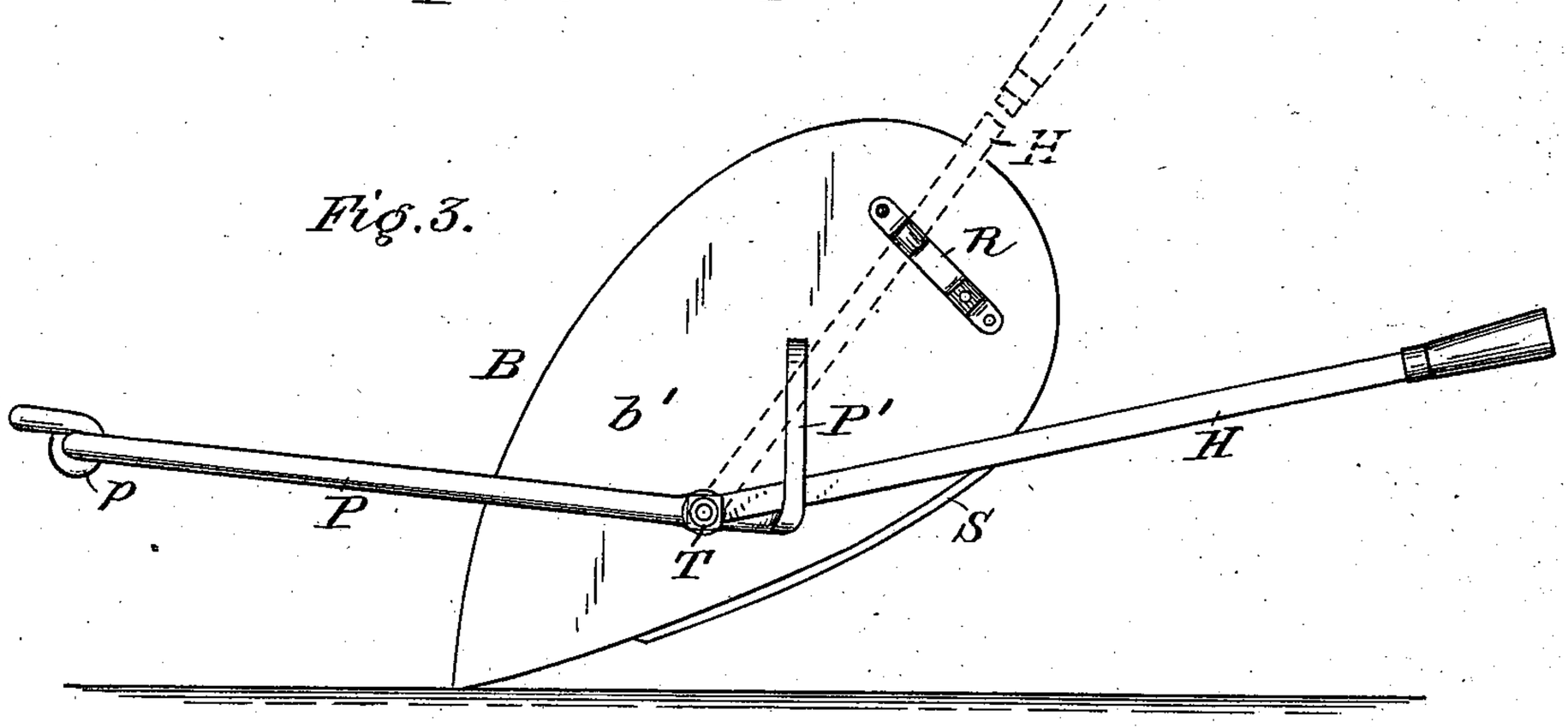

Fig. 3.

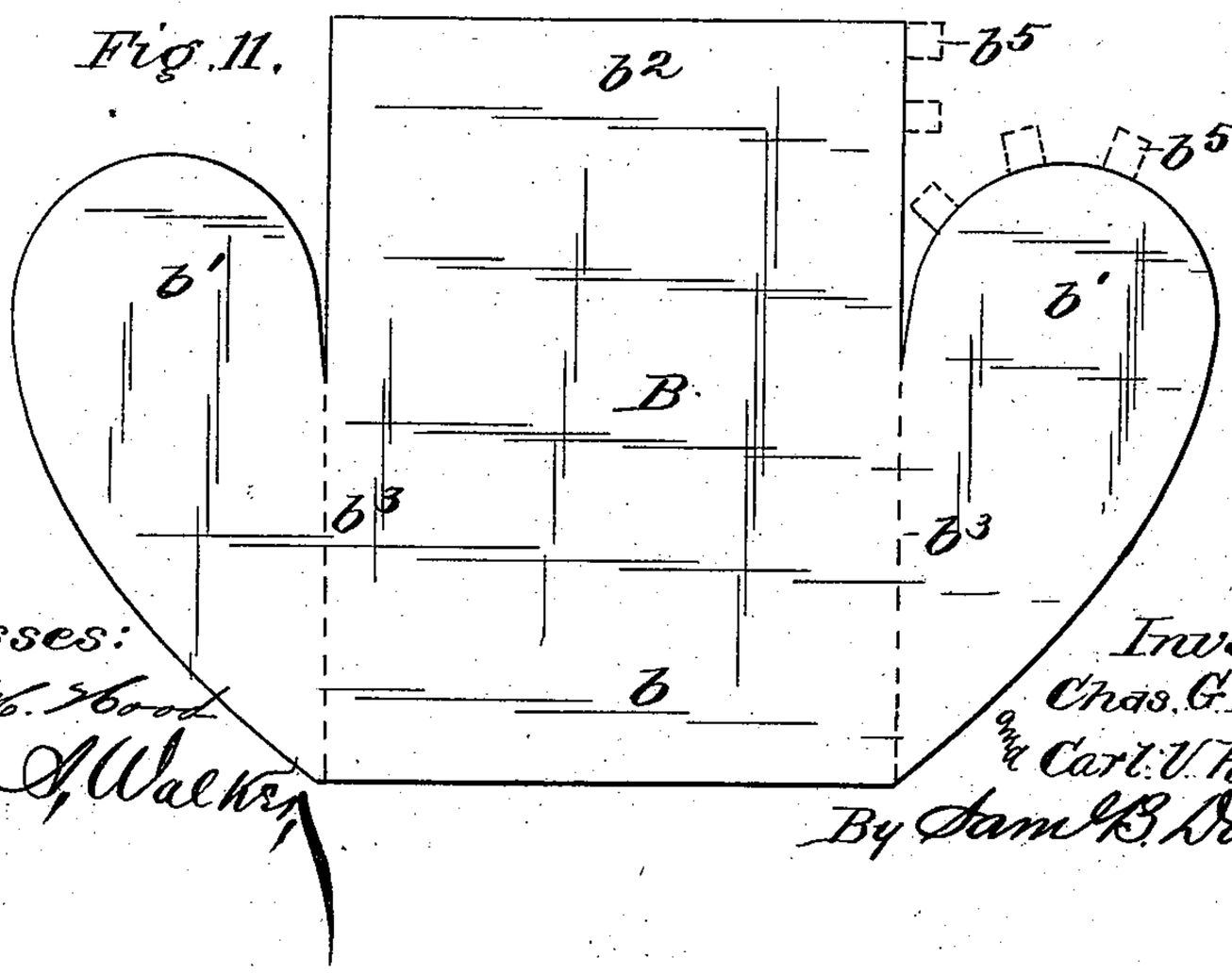

Fig. 11.

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UNITED STATES PATENT OFFICE.

CHARLES GUSTAV PETERSON AND CARL VICTOR RUNDBLAD, OF CHICAGO, ILLINOIS.

EARTH-SCRAPER.

SPECIFICATION forming part of Letters Patent No. 376,753, dated January 24, 1888.

Application filed June 20, 1887. Serial No. 241,915. (No model.)

To all whom it may concern:

Be it known that we, CHARLES GUSTAV PETERSON and CARL VICTOR RUNDBLAD, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Earth-Scrapers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to that class of earth-scrapers used in excavating and grading. The object of our improvements is, first, to reduce to a minimum the manual labor required in handling the scraper; second, to provide handles adjustable in height to the convenience of the operator; third, to give the body or scoop of the scraper such form that it may be readily constructed from a single piece of steel, and by its peculiar shape have advantage in receiving the dirt into it with as little friction as possible.

Minor improvements will be mentioned as they occur hereinafter.

In the drawings illustrative of our invention, Figure 1 is a perspective view of the complete scraper. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the scraper in course of turning forward and over to empty itself. The handle H has just been released from the rack R and dropped from its dotted to its lower full-line position. Fig. 4 is a similar view, the scraper having gone over, the bottom being now up and the contents thrown out. Fig. 5 is a perspective detail view of one of the trunnions T, which attaches the bail P of the scraper to the scoop or body B. Fig. 6 is a detail sectional view on line *x x* of Fig. 4, showing the mechanism by which the handle H is released from the rack R. Fig. 7 is a sectional view of a corner of the body of the scraper, taken on line *z z* of Fig. 4. Fig. 8 is a similar view of a modification of the same. Fig. 9 is a similar view of another modification of the same. Fig. 10 is a sectional view, on line *y y* of Fig. 2, of the shoes of the scraper and the means of its attachment to the bottom. Fig. 11 represents a blank of sheet-steel ready to be bent and formed into a scraper-body.

Similar letters throughout the several views indicate similar parts.

We will now proceed to describe the construction of the body or scoop B of the scraper.

A blank (shown in Fig. 11) is cut from a single sheet of steel, iron, or other suitable metal by the usual methods. The flaps b' b' are bent up in rounded right angles to the bottom b on the lines b^3 b^3 to form the sides, and the rear flap, b^2, is then rounded up to match the rear ends of the sides, and several angle-irons, b^4 b^4, are so riveted as to securely connect the sides and rear to each other, as shown in Fig. 8.

Several modifications of the method of fastening the sides and rear together may be made—as, for example, the lugs b^5 b^5 (shown in dotted lines in Fig. 11) may be left standing on the sheet from which the scoop is formed, and these, turned over at right angles, will take the place of the angle-irons which we have shown; or, as another modification, an entire edge of either of the sides or the rear may be similarly treated and be made to answer the same purpose.

The rear piece, b^2, may, if desired, be turned in first and the sides b' b' be made to coincide with and lie against it, as shown in Fig. 7; or the ends of the sides b' b' and the rear piece, b^2, may be slightly rounded at their point of union, if desired, and riveted directly to each other, and the sharp corner thus destroyed, the material point of this feature of the invention being in each case that flaps b' b' of a sheet blank be bent up at approximately right angles to the bottom b, and the rear piece, b^2, be rounded up to and secured to the ends of these sides in a substantial and rigid manner. It is intended that the rear piece, b^2, shall form approximately a concavo-cylindrical surface equal to or more than a quarter of a circle in height. The object of this construction is to avoid an acute corner and perpendicular wall, against which the earth would strike and jam, increasing the entering resistance to the dirt following, and provide instead rounded lines which guide the incoming material in the direction of the arrows of Fig. 1 over and back on itself in a natural curve the full width of the scoop. The draft of the scoop is much

lessened by this provision, and it forms a very desirable feature of the invention.

A description of the method of operating a scraper of ordinary construction will be given.

The handles fixed to the body or scoop of the scraper are grasped by the operator and the horses hitched to the implement are started. The rear of the scoop is now slightly elevated, gouging the front edge into the ground. When a sufficient load is obtained by the forward motion of the scraper, the handles are again released, and the point of the scoop, being slightly upturned by construction, frees itself from the ground, and the loaded scraper is drawn to the dumping-place. Here the rear of the scoop is once more elevated, and the front edge, engaging with the ground, assists in the motion until the scoop is overturned forward. It is drawn in this position, using the sides as runners, to the place of excavation. The horses are here stopped and the heavy scoop, by the direct lifting force of the operator, is righted and the foregoing operation repeated.

In our improved apparatus the horses need never be stopped, and the severe manual work of righting the scoop is avoided. This makes it possible not only to accomplish much additional work with less fatigue, but also to employ much younger, and consequently cheaper, labor. This, the first object of our invention, is accomplished by the construction of parts which we will now proceed to describe.

The sides *b' b'* of the scoop B are formed higher than usual and with a rounded contour, which gives them approximately an oval shape, the rear ends being semicircles. By reference to Fig. 4 it will be seen that when the scoop is inverted in the process of dumping its contents, this being done as in the ordinary scraper, the tendency is for it to continue rolling forward on its sides until it rights itself. This is owing to the shape given these sides, which act as wheels. Motion is given the scoop through the trunnions T and the bail P, which has pivotal connections on the trunnions by the horses hitched to the bail. These trunnions are placed by the inversion of the scoop at some distance from the ground, and by their position, which throws the drawing force at same height, gives the latter a strong leverage over the resistance. The scoop is drawn forward and over and resumes its normal position. It is then drawn to the place of excavation and operations once more resumed. The horses, as before stated, have not stopped, nor has the operator been called upon for severe labor. The action of the scraper is continuous and automatic.

We will now describe the mechanism which retains the scoop in position and by which it is operated.

The trunnions T, to which the bail P is attached, are preferably formed of a single forging or casting, as shown in Fig. 5. They consist of a plate, *t*, provided with riveting-holes *t'*, on which is mounted the stud t^2. This stud is threaded on the out end and provided with a nut with which to confine the bail P and handle H, pivoted thereon. A fixed collar, t^3, strengthens the point of union of the stud t^2 and plate *t* and forms a side bearing-surface for the bail. The bail P is continued on either side beyond the trunnions and turned up into the hook or loop P'. The handle H passes through this loop and is limited in its motion in outward, upward, and downward directions by it. A rack, R, shown here with two steps, but which may, if desired, be constructed with three or more, is riveted one to each side of the scoop. The handle H may be placed, at the will of the operator, in either of these steps to suit his individual height, and he is thus enabled to use his strength to the best advantage and with the least fatigue.

In operating the scraper to discharge it the handles are allowed to rise, and with them the rear of the scoop, until the shanks of said handles are caught by the cam-surface *b''* of the arm P', as shown in Figs. 3 and 6, and forced by it into the dotted positions of Fig. 6, which releases it from the rack R. The scoop continues its rotation, and the handles, if released from the hands, fall back to the position shown in Fig. 3. The same operation is gone through with in case the scoop should strike an unyielding obstruction, whether when loaded or unloaded, a harmless maneuver being executed and work resumed immediately beyond the obstruction. This feature of the invention renders breaking accidents far less frequent than in the common scoop.

Shoes or runners on the bottom of scraper-scoop are in common use. These have heretofore been riveted or otherwise fixedly secured to the said bottoms.

In using the scraper in wet clay or other moist sticky earth the bottom is liable to become clogged, owing to the projection of the shoes. It is therefore at times desirable to remove these shoes and operate the scraper with a smooth bottom. To provide for this emergency the shoes S S (shown in Figs. 2 and 10) are attached to the scoop by screws threaded into the shoe and with countersunk heads let into the upper surface of the bottom of the scoop. The shoes are thus readily removed and replaced as occasion may require. A simple means of attachment of the hook of the whiffletrees to the bail P is shown most clearly in Fig. 1. It consists of a U-shaped iron with its prongs wrapped around the bail about its middle and welded thereto. Side movement of the hook in the bail is prevented and the strength of the bail is unimpaired.

We do not wish to limit the use of the sides *b' b'* to any particular form of scoop as to its construction and shape of its body, but claim, broadly—

1. In an earth-scraper, the combination, with the body of the scraper, of the pivoted handles H, adjustable to the height of the operator, substantially as specified.

2. In an earth-scraper, the handles H, piv-

oted to the body of the scraper, in combination with a suitable rack, R, having two or more steps, whereby the height of the handles may be regulated, substantially as shown.

3. In an earth-scraper, the bail P, having the loop ends P′, provided with the cam ends *b″*, in combination with the handles H, substantially as shown, and for the purpose specified.

4. In an earth-scraper, the pivoted handles H and the rack R, in combination with the bail P, having the retaining-loop P′, provided with the throwing-out cam *b″*, substantially as shown.

5. In an earth-scraper having the sides *b′ b′* of such shape and proportions as described, in combination with the adjustable handles H H, the rack R and the bail P, provided with automatic releasing mechanism for the handles, substantially as shown and specified.

6. In combination with the bail of an earth-scraper, the U-shaped attachment-iron having its prongs turned about said bail and welded thereto, substantially as specified.

In witness whereof we hereunto subscribe our names this the 24th day of May, A. D. 1887.

CHARLES GUSTAV PETERSON.
CARL VICTOR RUNDBLAD.

Witnesses:
WM. M. GILLER,
T. H. HOOD.