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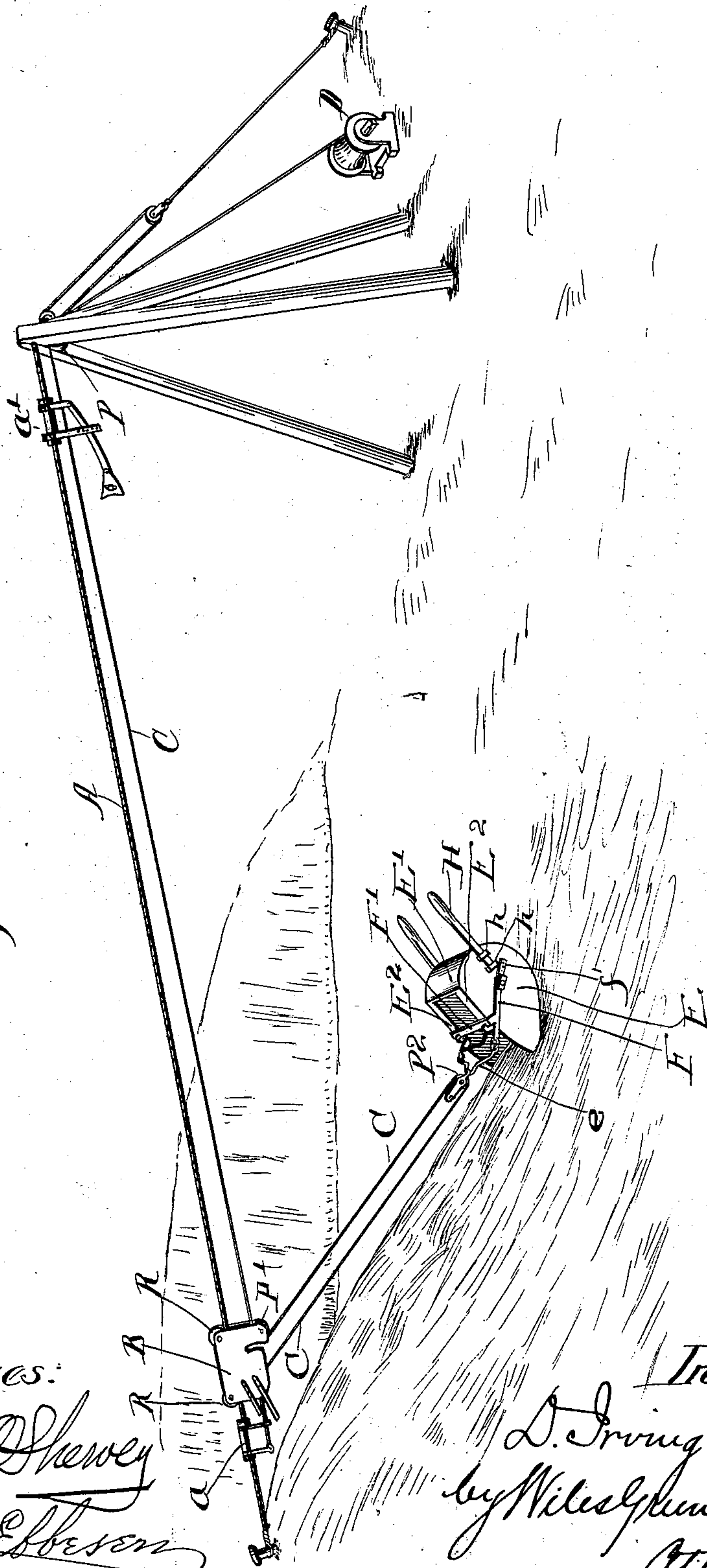
3 Sheets—Sheet 1.

D. I. CALHOUN.
EXCAVATING SCRAPER.

No. 506,667.

Patented Oct. 17, 1893.

Fig. 1.



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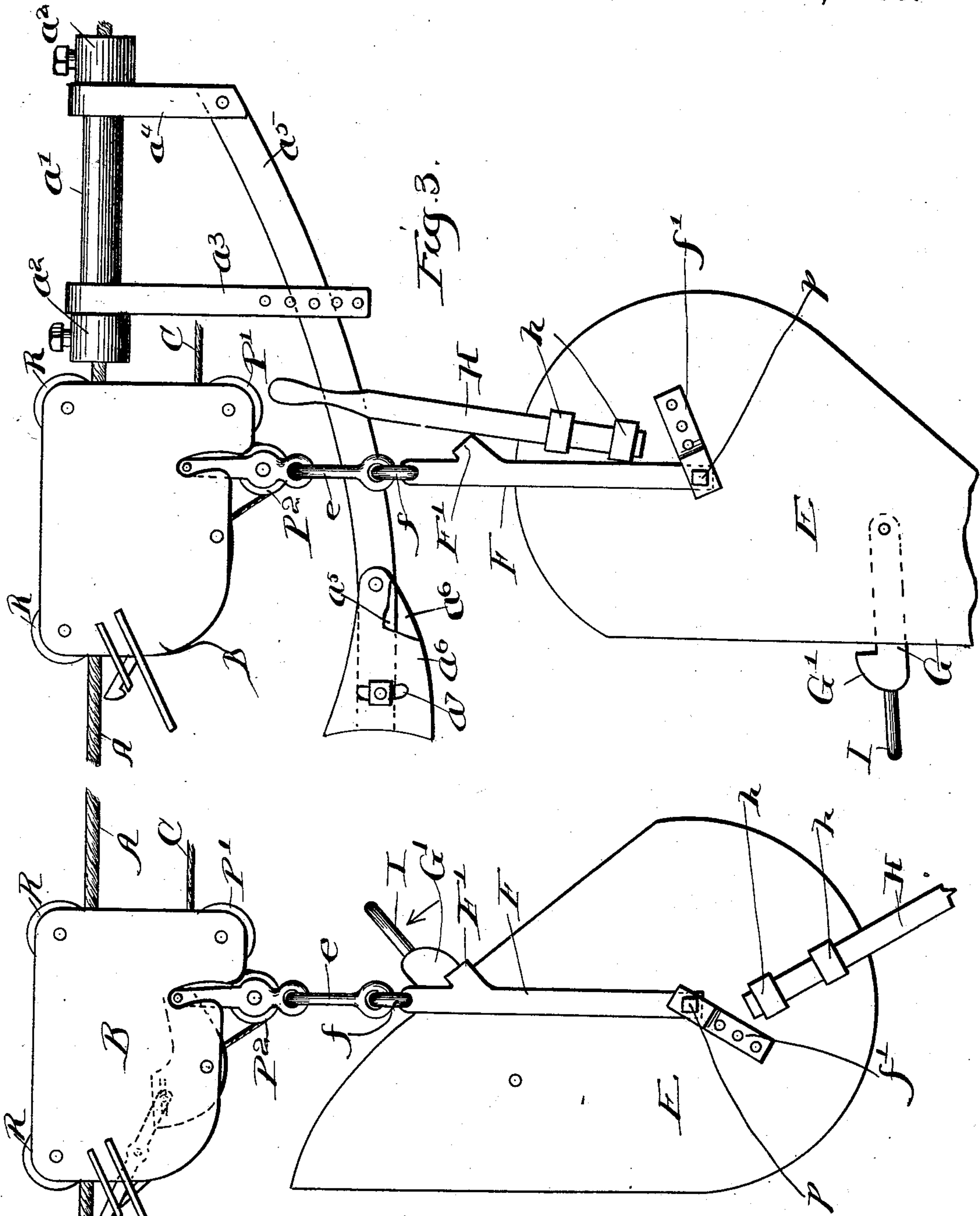
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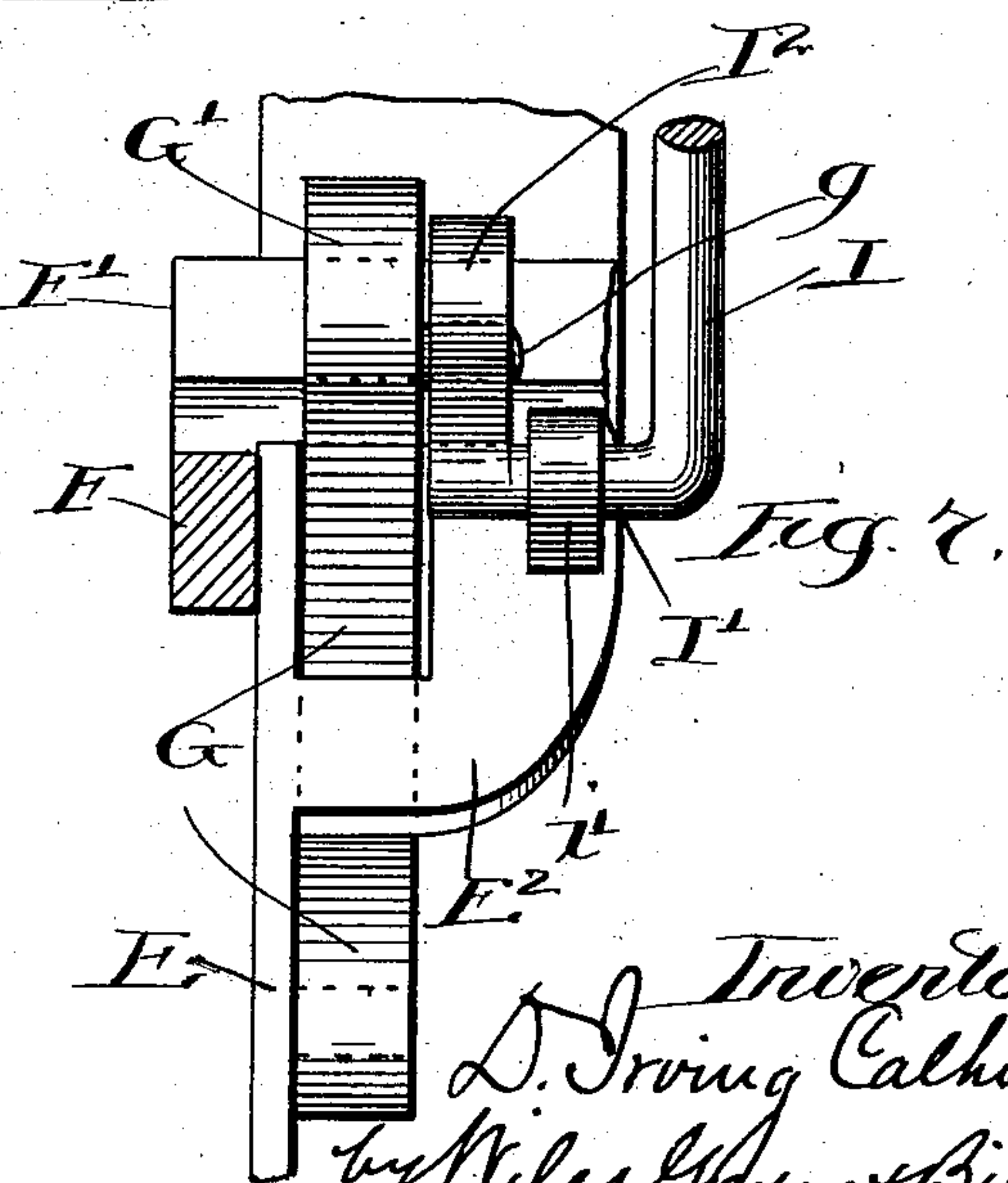
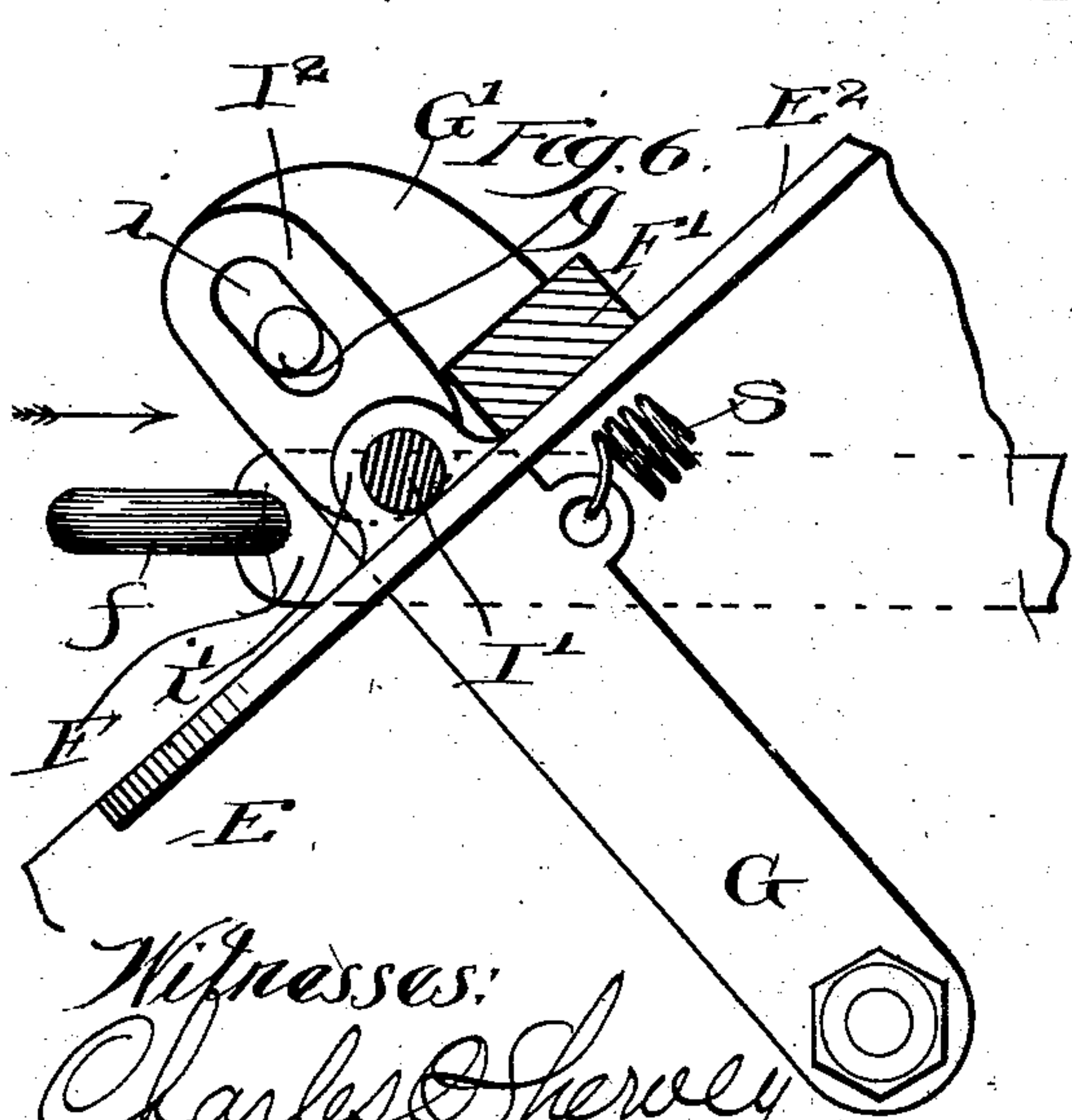
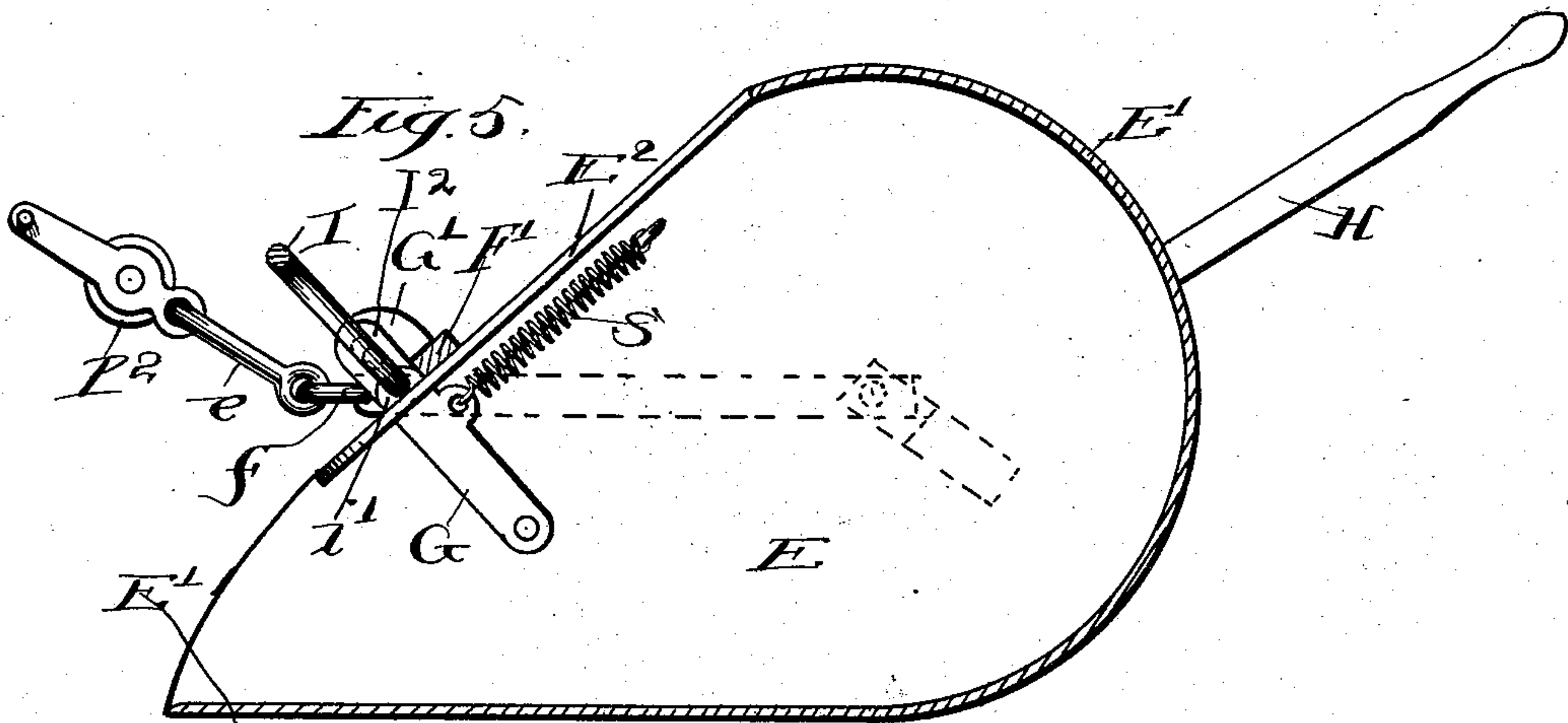
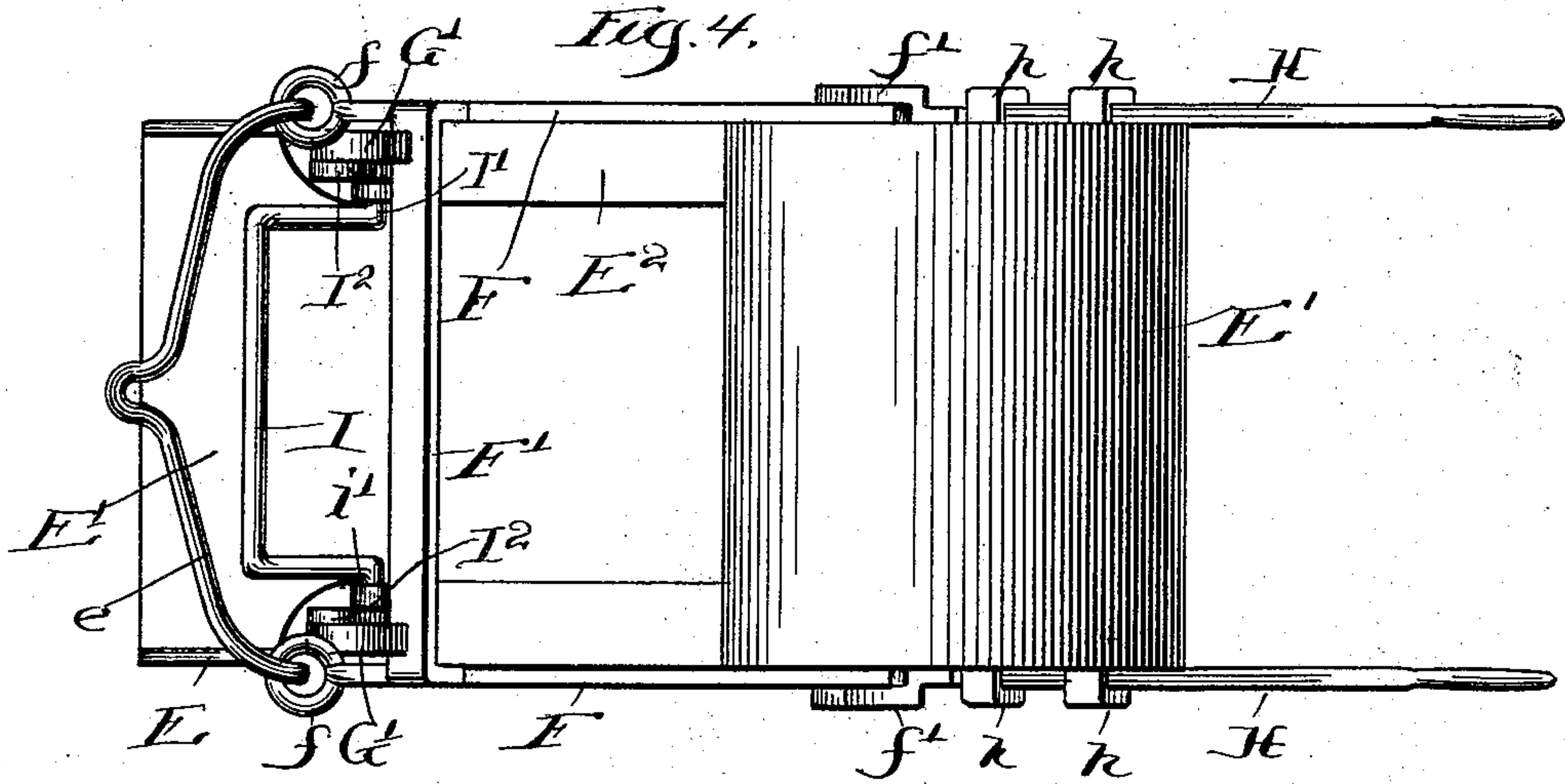
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UNITED STATES PATENT OFFICE.

DANIEL IRVING CALHOUN, OF CHICAGO, ILLINOIS, ASSIGNOR TO CLARA S. CALHOUN.

EXCAVATING-SCRAPER.

SPECIFICATION forming part of Letters Patent No. 506,667, dated October 17, 1893.

Application filed April 22, 1893. Serial No. 471,412. (No model.)

To all whom it may concern:

Be it known that I, DANIEL IRVING CALHOUN, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Excavating-Scrapers, of which the following is a specification.

My invention relates to improvements in excavating scrapers of the class adapted to be operated by power in excavating work of considerable extent and to be hoisted, conveyed a considerable distance and dumped at a single operation.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a scraper embodying my improvement in working connection with a suitable apparatus for operating it. Fig. 2 is a side elevation of the scraper in its position while being conveyed from one point to another. Fig. 3 is a similar view of the scraper in its dropped or dumping position. Fig. 4 is a top plan of the scraper when in the position illustrated in Fig. 5. Fig. 5 is a longitudinal vertical section of the scraper in the position illustrated in Fig. 4. Fig. 6 is a view partly in vertical section and partly in internal side elevation showing the latch for locking the hinged bail of the scraper together with the parts co-acting with the latch; and Fig. 7 is an elevation of the parts shown in Fig. 6, the view being in the direction indicated by the arrow in Fig. 6.

In the views, A is a cable supported and stretched by any suitable means and provided with stops, *a*, *a'*, situated near its ends and adapted to operate the scraper and the scraper-supporting carriage, respectively.

B is a carriage provided with rollers, R, R, resting upon the cable, A, and adapted to move longitudinally thereon, the carriage being provided with suitable latching mechanism adapted to connect it with a suitable stop, *a*, and the carriage and stop being of substantially the construction illustrated in my United States Patent, No. 283,964, of August 28, 1883.

C is an operating rope secured at one end to a drum, D, adapted to be operated by any

suitable power and passing thence about pulleys, P, P', P², to the carriage, B, to which its free end is fastened. The pulley, P, is hung in a suitable block suspended from the cable-support near the drum, D, the pulley, P', is mounted in the carriage, B, and the pulley, P², is mounted in a pulley-case hooked to the bail, *e*, of a scraper, E, which will be more particularly described. The case of the pulley, P², is so constructed that when drawn upward to the carriage, B, it operates the mechanism connecting the carriage with the stop, *a*, and releases the carriage from the stop permitting it to move away from the stop and along the cable, A. If, therefore, the rope, C, be wound upon the drum, D, it will first draw the pulley, P², and scraper, E, upward to the carriage, B, thus releasing the carriage from the stop, *a*, and will then draw the carriage and scraper along the cable, A, until their motion is arrested by a stop, *a'*.

The scraper which has been designated by the letter E, is made up of two side pieces, E, E, and a casing, E', fastened to and connecting the edges of the two side pieces. The front end of each of the side pieces is a rather acute angle and its rear end is approximately an arc of a circle, and the casing, E', extends from the vertex of each of the side pieces along one of its straight edges and about the arc of the circle at its rear end, that portion of the casing along the straight edges of the two side pieces being the base of the scraper on which it ordinarily rests, and the face of the scraper opposite the base being left open. From the upper edge of the casing, E', two flanges, E², E², extend forward along the edges of the side pieces, the outer edge of each of the flanges being fastened to the edge of the corresponding side piece, and the front end of each flange being a considerable distance from the lower or front edge of the casing, E'. Each of the side pieces is provided with a handle, H, fastened to it in any desired manner, but preferably by means of loops, *h*, fastened to the side pieces and adapted to receive within them the inner end of the handle which is thus held securely in place. To the side pieces, E, E, are pivoted the lower ends of two bars, F, F, lying along the outer faces of the side pieces and connected near

their front ends by a transverse bar, F' , which rests upon the flanges, E^2, E^2 , across which it extends. The front ends of the bars, F, F , terminate in rings, f, f , to which are fastened the ends of the bail, e , already mentioned as connected with the case of the pulley, P^2 . The pivots connecting the ends of the bars, F, F , with the side pieces, E, E , are placed approximately at the centers of the arcs at the rear ends of the side pieces, and they may be of any desired construction, though I prefer that shown in the drawings, in which each of the side pieces is provided with a plate, f' , extending over the end of the corresponding bar, F , a bolt, or other pivot, being passed through the plate and the bar and into the side piece. Each end of the transverse bar, F' , is normally locked in its place upon the flange, E^2 , by means of a lever, G , pivoted to the inner face of the corresponding side-piece and provided with a hook, G' , adapted to overlap and engage the bar, F' , the engagement of the hook and bar being preserved by means of a spring, S , fastened at one end to the lever, G , and at the other end to the side piece as clearly shown in Fig. 5. When the transverse bar is so locked the draft upon the scraper is applied to the two eyes, f, f , and draws the scraper in the same manner as if the eyes were permanently fastened to the scraper in their locked position. Power being thus applied to the scraper which is held in approximately the position shown in Fig. 1, and may be inclined at the will of the operator by means of the handles, H, H , the scraper is drawn forward until it is filled and is then drawn upward until the case of the pulley, P^2 , strikes the carriage and disconnects it from the stop, a , when the carriage moves away from the stop, and the scraper being suspended from the eyes, f, f , assumes substantially the position illustrated in Fig. 2, in which it carries securely as much material as the space within it will contain, and the material may thus be moved from the point of excavation to any other point at a desired distance therefrom.

In order that the scraper may work practically and economically, it is necessary to provide it with some means for its automatic discharge of the material within it and for this purpose I have mounted upon the flanges, E^2, E^2 , a transverse cranked lever, whose central portion, I , extends upward a considerable distance from the open face of the scraper, the ends of the central raised portion being bent downward at right angles thereto and bent again in lines, I' , parallel to the central portion, I , and again bent upward at right angles to the parts, I' , to form levers, I^2, I^2 . The parts I', I' of the crank lever are journaled in suitable bearings, i', i' , mounted on the flanges, E^2, E^2 , and each of the upturned ends I^2, I^2 , is formed with a slot, i , which embraces a pin, g , on the inner face of the corresponding hook, G' . It is evident that so long as the lever, I, I', I^2 , remains in

the position indicated in Figs. 2 and 6, the hooks, G' , will remain in engagement with the bar, F' , and hold it in its locked position; but if on the other hand, the central portion I , of the lever be rocked in the direction indicated by the arrow in Fig. 2, its ends, I^2, I^2 , must move the hooks, G', G' , in the same direction and thereby release them from the transverse bar, F' . In order that the lever may be thus rocked about the parts I', I' , the cable, A , is provided at a suitable distance from the stop, a , with a second stop having the construction shown in Fig. 3, in which, a' is a tube fitting loosely upon the cable and provided at its end with thimbles, a^2, a^2 , fastened to the cable by means of set screws. On the tube, a' , are pivoted two suspended arms, a^3, a^4 , which support an oblique bar, a^5 , carrying at its ends two plates, a^6, a^6 , lying in vertical planes on opposite sides of the bar and having their ends slightly concave and of such width as to form a stop for the central portion, I , of the tripping lever, as the carriage and scraper move along the cable. When the part, I , of the lever strikes the plates, a^6, a^6 , it is pushed forward in the direction indicated by the arrow in Fig. 2, and draws the hooks, G' , out of engagement with the bar, F' , thus releasing the bar and leaving the scraper free to swing about the pivots which connect it with the bars, F, F . The center of gravity of the scraper being between the pivots, p, p , and the front edge of the scraper, the front edge drops down until the scraper reaches approximately the position shown in Fig. 3, when all its contents are readily discharged leaving the scraper free to return for another filling. In order to provide for any difference in the position of the scraper with reference to the cable I prefer to form the arm, a^3 , with a series of bolt holes for changing the inclination of the bar, a^5 , and I also form each of the plates, a^6 , with a slot, a^7 , which permits adjustment of the end of the plate. The arms, a^3, a^4 , being pivoted upon the tube, a' , hang always in a vertical plane, their position being entirely unaffected by the twisting of the cable which would throw them out of place if they were rigidly fastened to it.

It will be observed that by pivoting the bars, F, F , at substantially the point shown in the drawings and locking them to the upper edges of the side pieces at points near the front or working edge of the scraper, I have added very greatly to the efficiency of scrapers of ordinary construction for the following reasons. First, in filling the scraper, the point of draft is so near the working edge as to give the operator the advantage of a long leverage, so that he can control the scraper with perfect ease and hold it in any desired position. Second, after the scraper is filled and when it is raised from the ground to be conveyed along the cable, it hangs in such a position as to hold securely the greatest possible amount of material. Third, after the release of the bar, F' , from the hooks,

G', G', and the inversion of the scraper, the position of the pivots, *p, p*, is such as to cause the scraper to hang in an approximately vertical position and thus to insure the perfect discharge of its contents. These results being attained without any added expense the entire device is not only practical and effective, but is also cheap and simple.

The form of the side pieces of the scraper as shown in the drawings, is extremely advantageous, since their narrow front ends bring the locking points of the bar, F', very near the working edge of the scraper, while their broadened rear ends give the scraper the necessary capacity to hold a large amount of material. The curve at the rear end of each of the side pieces forms a deep concave pocket for retaining the contents of the scraper as it is conveyed along the cable, and this shape also facilitates the emptying of the scraper when it is reversed for dumping. So far as the pivoting of the bars, F, F, to the side pieces is concerned, it may evidently be substantially the same whether the rear end of the scraper be curved or flat, the important requirement as to the location of the pivots of the bars, F, F, being that they shall be in rear of the center of gravity of the scraper and shall be on a line approximately symmetrical with reference to the upper and lower edges of the side pieces.

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

1. The combination with a scraper made up of two side pieces and a casing fastened to and connecting the lower and rear edges of the side pieces, of a transverse bar adapted to rest upon the upper edge of the scraper, two bars having their front ends fastened to the ends of said transverse bar and their rear ends pivoted to the side pieces of the scraper at points in rear of their centers of gravity and approximately midway between their upper and lower edges, latches pivoted to the side pieces and adapted to lock the transverse bar near the front end of the scraper, and means substantially as shown and described for operating the latch and releasing the bar.

2. The combination with a scraper made up of two approximately triangular side pieces, and a casing having its front edge fastened to each of said triangular side pieces at its vertex and extending back along one side and about the base of each of said triangles, of a transverse bar adapted to rest upon and across the upper edges of said side pieces near their front ends, two bars fastened to the ends of said transverse bar and having their rear ends pivoted to the side

pieces at points in rear of their centers of gravity and approximately symmetrical with reference to the upper and lower edges thereof, latches pivoted to the two side pieces, respectively, and adapted to lock the transverse bar near the front edge of the scraper, and a swinging lever pivoted to the scraper and adapted by a given movement to actuate the latches and release the bar.

3. The combination with a scraper made up of the approximately triangular side pieces, E, E, having their rear ends curved substantially as shown, and the casing, E', extending along one side and about the rear end of each of the side pieces, of the transverse bar, F', the bars, F, F, joined to the bar, F', and pivoted at their rear ends to the side pieces at points in rear of their centers of gravity and approximately at the centers of their curved rear edges, the latches, G, G, pivoted to the side pieces and having hooks, G', G', adapted to engage the bar, F', springs tending to hold the latches in engagement with the bar, F', and the pivoted lever, I, I', engaging the latches and adapted when rocked through a given angle to disengage the latches from the bar, F', substantially as shown and described.

4. The combination with the scraper formed substantially as described, of the bars, F, F, F', pivoted to the scraper, the latches, G, G, G', G', the rocking lever, I, adapted to actuate the latches, the cable, A, a suitable carriage mounted on the cable and adapted to support and convey the scraper and the stop made up of a tube, *a'*, clamped upon the cable, depending arms, *a*³, *a*⁴, swinging upon the tube, a bar, *a*⁵, supported by the arms and lying beneath the cable and a plate or plates, *a*⁶, forming the broad front end of the bar and adapted to serve as a stop for the lever, I, and thereby to rock the lever and release the bar, F'.

5. The combination with a scraper formed substantially as described and having the bars, F, F, F', locking latches G, G, and swinging lever, I, of the cable, A, and carriage, B, and the stop made up of the tube, *a'*, locked to the cable, the swinging arms, *a*³, *a*⁴, the arm, *a*⁵, pivoted to the arm, *a*⁴, and vertically adjustable in the arm, *a*³, and the plates, *a*⁶, fastened to the end of the arm and formed with slots, *a*⁷, whereby their front ends may be vertically adjusted, the entire stop being adapted to arrest and swing the lever, I, and thus to release the bar, F'; substantially as shown and described.

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