

J. KIESLER.

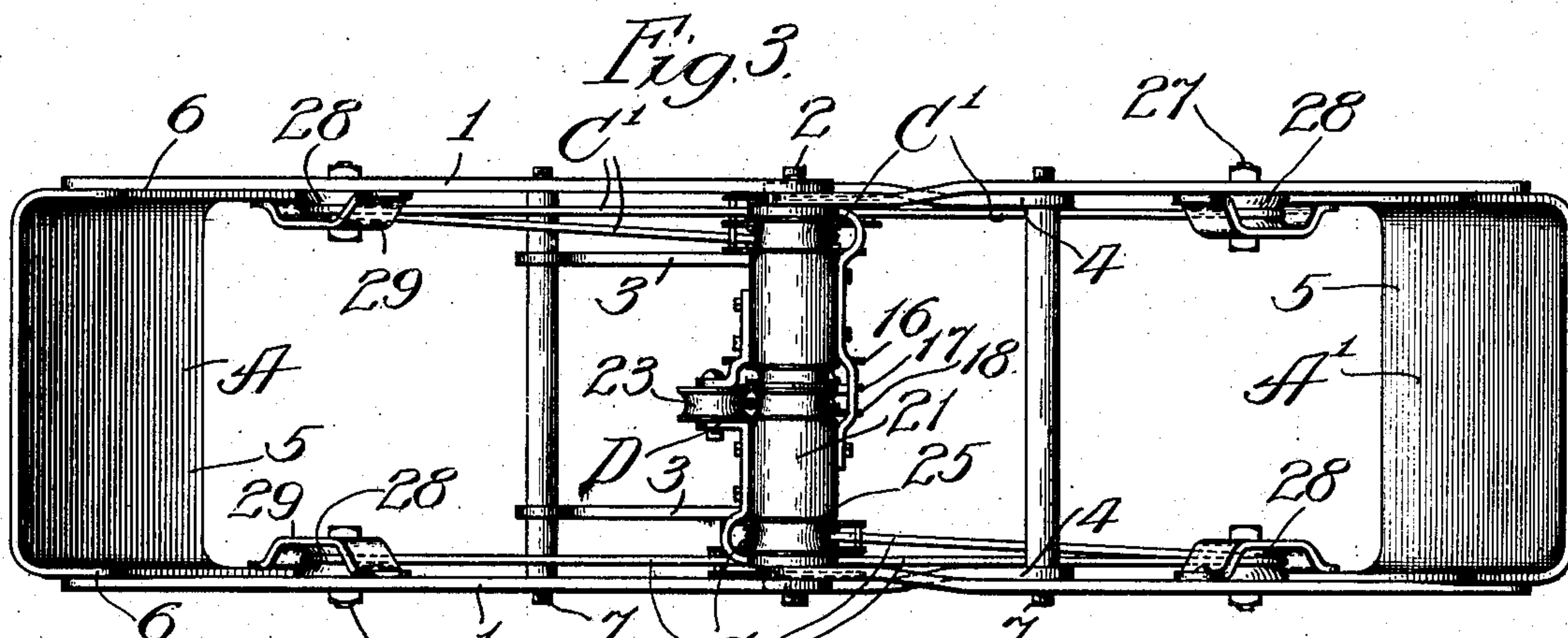
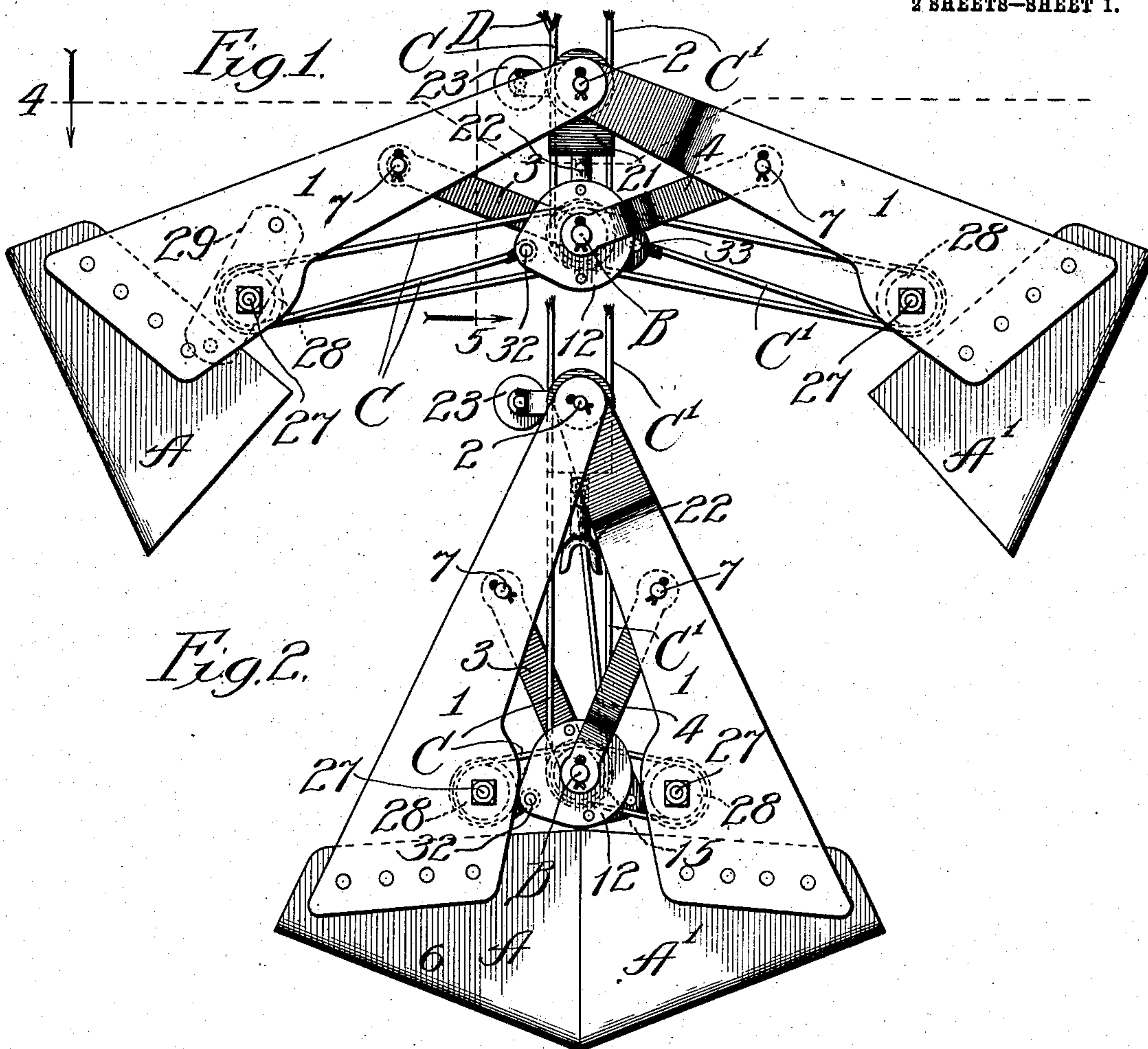
POWER SHOVEL.

APPLICATION FILED DEC. 5, 1908.

936,727.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.



Witnesses:
John Enders
Chas. H. Buell

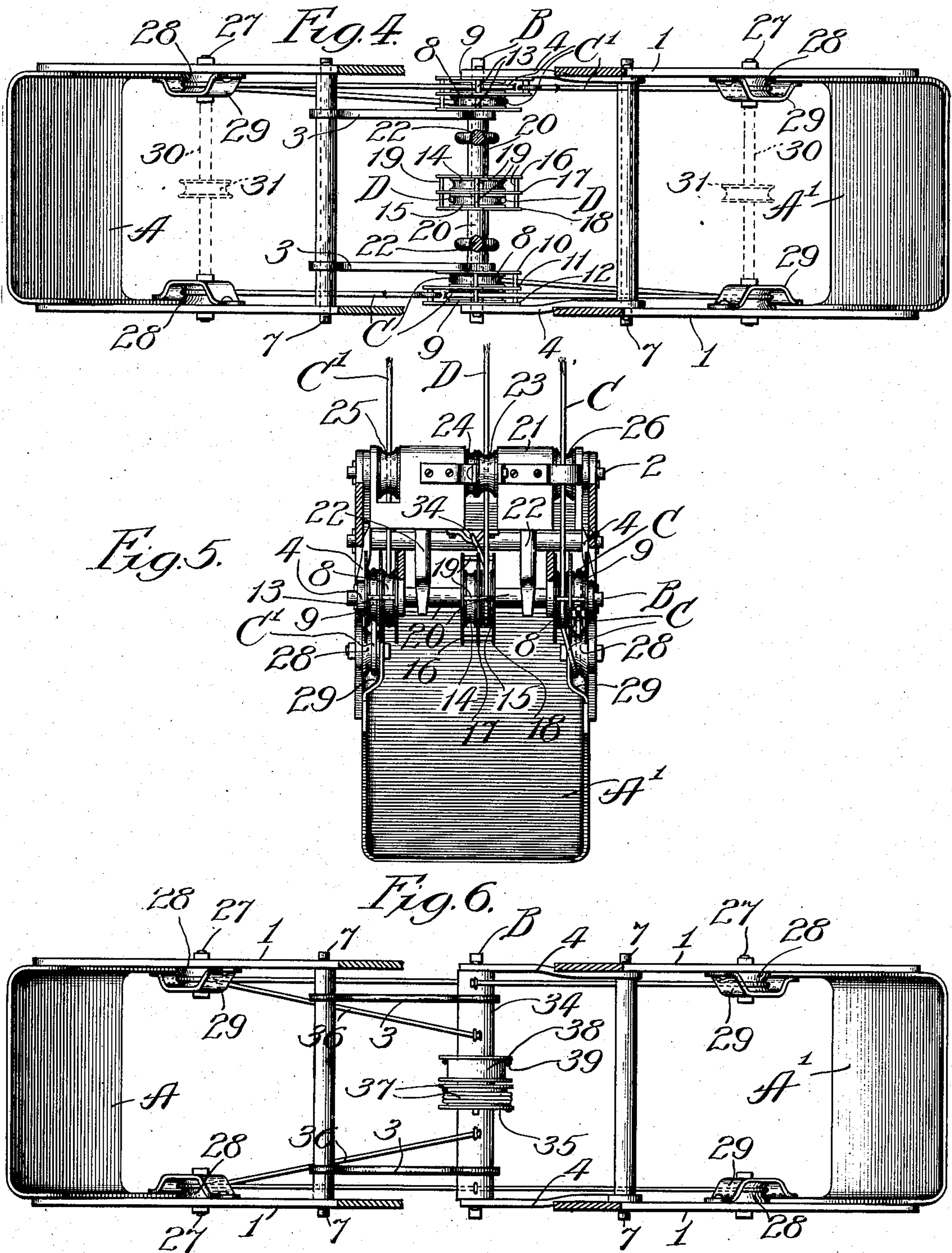
Inventor:
Joseph Kiesler
By Ogden Smith, Lee, Chittum & Miles
Attys.

J. KIESLER.
POWER SHOVEL.
APPLICATION FILED DEC. 5, 1908.

936,727.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 2.



Witnesses:

John Enders
Chas. H. Buell

Inventor:

Joseph Kiesler

By *Dyrenforth, Lee, Chritton & Viles*
Attys. #

UNITED STATES PATENT OFFICE.

JOSEPH KIESLER, OF CHICAGO, ILLINOIS.

POWER-SHOVEL.

936,727.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed December 5, 1908. Serial No. 466,092.

To all whom it may concern:

Be it known that I, JOSEPH KIESLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Power-Shovels, of which the following is a specification.

My invention relates particularly to an improved power-shovel for use in handling or unloading ore, coal, grain and the like material, as from the hold of a boat, and for analogous uses; and my primary object is to provide a shovel of the character indicated capable of operating within a limited space and also capable of filling itself with facility, regardless of the character of the material which the shovel is employed to handle.

In the accompanying drawings, which illustrate my invention, I have shown a power-shovel particularly adapted to the purpose of handling heavy lump material, such as ore in lump.

So far as I am aware, prior to my invention, no power shovel well adapted to the handling of heavy lump material, such as iron ore in the lump, has been known. Inasmuch as the shovels heretofore known have not been adapted to the function of properly loading themselves with material of this character. My invention provides a shovel of a character to insure the proper filling of the shovel with such material, said construction being also well adapted to perform the filling operation in close quarters, as in the hold of a ship.

In the accompanying drawings—Figure 1 is a side elevational view of my improved power-shovel in the open condition; Fig. 2, a similar view showing the shovel in its closed condition; Fig. 3, a plan view of the shovel in its open condition; Fig. 4, a horizontal sectional view taken as indicated at line 4 of Fig. 1; Fig. 5, a vertical sectional view taken as indicated at line 5 of Fig. 1; and Fig. 6, a plan sectional view similar to Fig. 4, and showing a modification of the invention.

Referring to Figs. 1 to 5, A, A¹, represent a pair of shovel-sections, or shovel-jaws, equipped with rigidly-carried arms 1 connected by a pivot 2; B, a shaft suspended by pairs of links 3 and 4 from the arms 1, said shaft B being disposed beneath the pivotal shaft 2 of the arms 1; C, C¹, a pair of jaw-closing cables employed; and D, a jaw-open-

ing cable employed. Each of the shovel-sections A, A¹ comprises, preferably, an inclined bottom 5 (referring to the closed condition of the shovel), and sides 6. The arms 1 are rigidly connected with the sides of the shovel-sections, the lower ends of the arms 1 being preferably riveted to the sides of the shovel-sections. The arms 1 are, as shown, at an angle to the bottoms of the shovel-sections, so that in the closed position of the shovel the arms in connection with the bodies of the shovel-sections form a triangle, the bottoms of the shovel-sections forming the base of the triangle and the bodies forming the sides thereof, as clearly shown in Fig. 2. The shaft B is journaled in the lower ends of the pairs of links 3 and 4, and the upper ends of the links 3 and 4 are connected with pivots 7 which connect the members of each pair of arms 1. The shaft B has mounted thereon, adjacent to each end, two sheaves 8 and 9, located within a housing composed of disks 10, 11 and 12, journaled on the shaft B and connected by rivets or spacers 13. The shaft B also has mounted upon its central portion sheaves 14 and 15, confined between disks 16, 17 and 18 journaled on the shaft and connected by rivets, or spacers, 19. The central sheaves and housing therefor are confined against longitudinal movement on the shaft by sleeve-sections 20. Upon the pivotal shaft 2 is journaled a block 21 from which depend yokes 22 which serve as stops to limit the approach of the shaft B toward the pivotal shaft 2. The block 21 is recessed centrally to accommodate sheaves 23 and 24 which are journaled upon the pivotal shaft 2, and said block 21 is recessed near its ends to accommodate sheaves 25 and 26 which are journaled upon the shaft 2. The arms 1 support, near their junctions with the sides of the shovel-sections, pivots 27 upon which are journaled sheaves 28 located adjacent to the inner surfaces of said arms protected by housings 29. If desired, the pivots 27 may be extended between the members of each pair of arms, as indicated by the dotted lines at 30, to support a central sheave 31. The cable C has one end connected, as indicated at 32, with the housing composed of the disks 10, 11 and 12, the cable passes thence about a sheave 28 on one of the arms of the shovel-jaw A, thence over the sheave 9, thence about the sheave 28 on the corresponding arm of the jaw A¹,

thence beneath the corresponding sheave 8 on the shaft B, and thence up to the sheave 25 on the pivotal shaft 2, from whence the cable passes to the drum of the hoisting engine. The cable C¹ is similarly attached at a point 33 at the opposite side of the shovel and passes in a similar manner about the sheaves at that side of the shovel, passing first, however, from the point 33 to the sheave connected with the farther arm of the shovel-section A¹. The central closing cable D has one end connected at the point 34 with the block 21, as shown in Fig. 5, the cable passes thence downwardly and about the sheave 15 on the shaft B, and thence upwardly and in contact with the sheave 23 on the pivotal shaft 2. If desired, the cable D may be made to pass also about the sheaves 14 and 24 located, respectively, on the shafts B and 2. Ordinarily, however, sufficient opening power may be secured by passing the cable D in the manner illustrated in the drawings.

From the foregoing description, the operation will be readily understood. When it is desired to fill the shovel, it is lowered upon the material by the cable D, which maintains the jaws in the open condition. The cable D is then slackened and the cables C, C¹, are employed to close the shovel and to elevate the shovel with its load. In the closing operation, the cables C and C¹ operate to draw the jaws together, causing them to dig into the material and become filled with the material. Owing to the almost vertical position of the jaws at the moment that the closing operation is begun, and owing to the wide reach of the jaws, the shovel operates in a very effective manner to perform the filling function, it being obvious that the shovel-sections will be caused to dig into the material and will have ample time to become wholly filled before the digging edges of the shovel-sections meet and the shovel is lifted from the material. Owing to the long reach of the jaws, it is possible to swing the shovel in the hold of a ship so that one jaw will lie close up against the side of the hold, thereby enabling the material to be taken from the hold of the ship practically without hand labor. It should be stated that in the operation of opening the jaws, the cable D operates to draw the shafts B and 2 toward each other, thereby forcing the jaws apart through the medium of pairs of links 3 and 4.

The modified construction illustrated in Fig. 6 is in the main similar to the construction already described, and the similar parts are identified by the same reference characters. In this modified construction, however, the shaft B has journaled thereon a sleeve 34 equipped with a rigidly secured drum 35. Cables 36 have their ends connected with the sleeve 34, said cables passing about the sheaves 28. It will be obvious that when the sleeve 34 is rotated, the cables 36

will be wrapped thereon, thereby closing the shovel-sections. The drum 35 has wrapped thereon a closing-cable 37 which serves as a medium for rotating the sleeve 34 in the operation of closing the shovel-sections. Upon the sleeve 34 is journaled a sheave 38 which corresponds with the sheave 15 of the above-described construction. The sheave 38 accommodates a jaw-opening cable 39 which corresponds with the jaw-opening cable D of the above-described construction. The cable 39 connects with the block 21 on the pivotal shaft 2 (not shown in Fig. 6) in the same manner as described with reference to the first-described construction.

If desired, the sheaves at the sides of the shovel illustrated in Figs. 1 to 5 inclusive, may be left unemployed, and the sheaves 31 indicated by dotted lines in Fig. 4 may be employed to accommodate a single jaw-closing cable, the central shaft 14 then serving to accommodate the same cable. It is obvious, therefore, that the manner of arranging the cables may be varied without departure from my invention.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation is to be understood therefrom.

While, by preference, the pivotal connections between the upper ends of the arms 1 is effected by means of the single pivot-shaft 2, the particular form of connection shown is not regarded as indispensable.

What I regard as new, and desire to secure by Letters Patent, is—

1. The combination of a pair of shovel-sections having rigidly-carried arms pivotally connected together, sheaves carried by said shovel-sections, a shaft supported by said arms, sheaves journaled on said shaft, and a closing cable passing about said sheaves.

2. The combination of a pair of shovel-sections having rigidly-carried arms pivotally connected together, links pivotally connected with said arms, a shaft supported by the lower ends of said links, and a closing-cable connecting said shovel-sections and said shaft, for the purpose set forth.

3. The combination of a pair of shovel-sections having rigidly-carried arms, a pivotal shaft joining the upper ends of said arms, links supported by said arms beneath said pivotal shaft, a shaft supported by the lower ends of said links, sheaves connected with the shovel sections, sheaves connected with said shafts, and a closing cable connected with said sheaves.

4. The combination of a pair of shovel-sections having rigidly-carried arms, a pivotal shaft connected with the upper ends of said arms, links connected with said arms beneath said pivotal shaft, a shaft supported by said links, a jaw-opening cable connect-

ing said shafts, and a jaw-closing cable connected with said shafts and with said shovel-sections near the bases of said arms.

5 The combination of a pair of shovel-sections having rigidly-carried arms, a pivotal shaft connecting the upper ends of said arms, a block on said shaft, a pair of links having their upper ends pivotally connected with said arms some distance beneath said
10 pivotal shaft, a shaft supported by said links, sheaves on said shafts, sheaves carried by said shovel-sections and located near the bases of said arms, a pair of closing cables passing about the sheaves on said shovel-sections and about sheaves on said shafts, and
15 an opening cable passing about sheaves on said shafts.

6. The combination of a pair of shovel-sections, each shovel-section having an inclined bottom and sides rising therefrom, inclined arms rigidly connected with the sides of said shovel-sections and having their upper ends meeting at an apex, a pivotal shaft connecting the upper ends of said
20 arms, a pair of links pivotally connected with each pair of arms at a distance beneath said pivotal shaft, a shaft supported by the

lower ends of said links, and cables connecting said shafts and said shovel-sections, for the purpose set forth.

7. The combination of a pair of shovel-sections, each shovel-section comprising an inclined bottom and sides rising from the ends of said bottom, a pair of inclined arms rigidly connected with the ends of each
35 shovel-section, said arms meeting at a common apex, a pivotal shaft connecting the upper ends of said arms, a link pivotally connected with the inner surface of each of said arms, a shaft supported by the lower
40 ends of said links, a shaft pivotally connected with each of said arms near the base thereof and located at the inner side of the arm, sheaves on the end-portions of said second-named shaft, sheaves on the end-portion
45 of said first-named shaft, closing-cables passing about said sheaves, centrally disposed sheaves on said shafts, and an opening cable connected with said last-named sheaves.

JOSEPH KIESLER.

In the presence of—

CHAS. E. GAYLORD,
RALPH A. SCHAEFER.