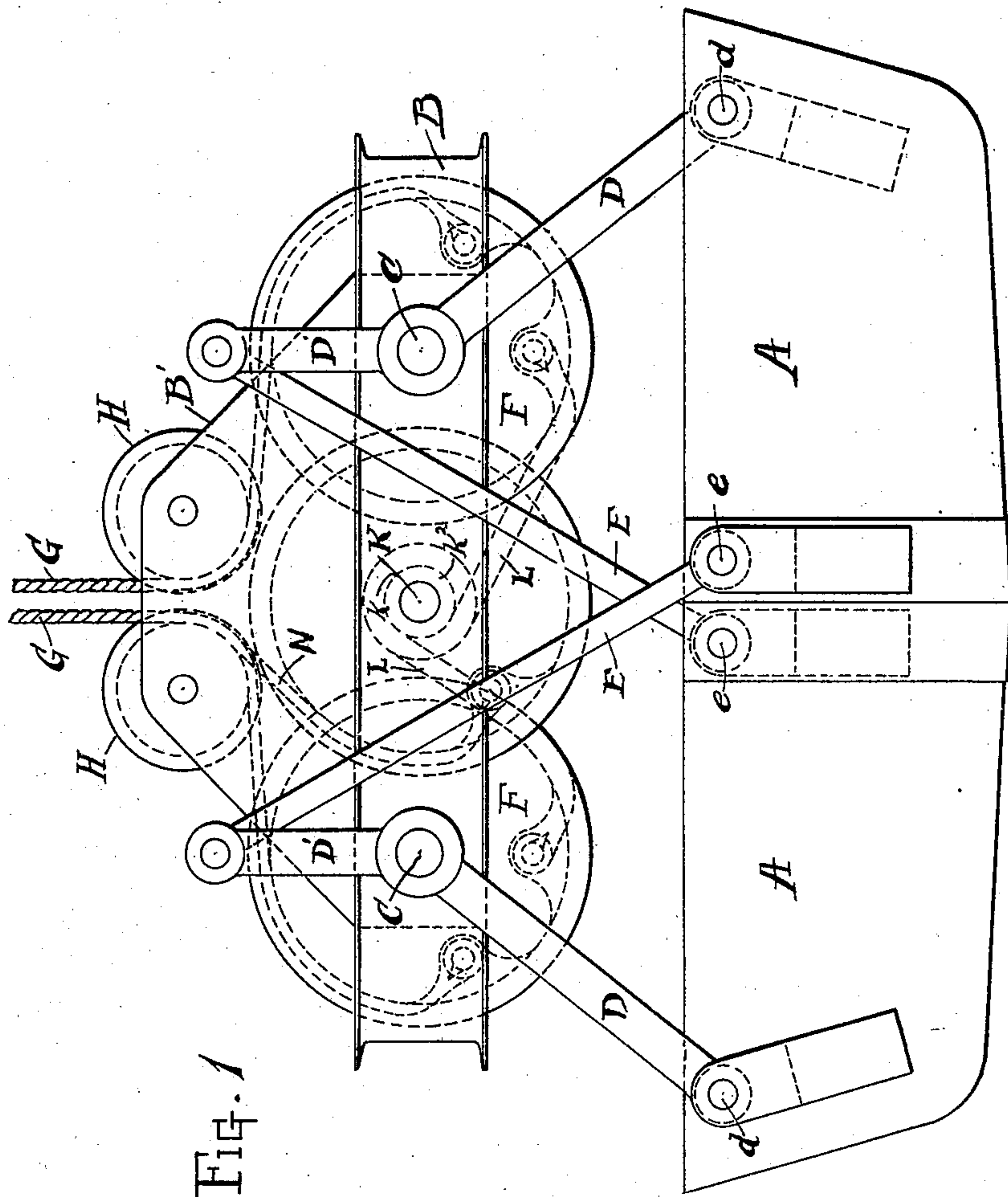


F. W. LOVELL.
CLAM SHELL BUCKET.
APPLICATION FILED JAN. 11, 1904.

919,446.

Patented Apr. 27, 1909.
4 SHEETS—SHEET 1.



WITNESSES
M. H. Mc Mullin.
E. B. Gil Christ

INVENTOR
Frederick W. Lovell
By Thurston Bates
his attorney

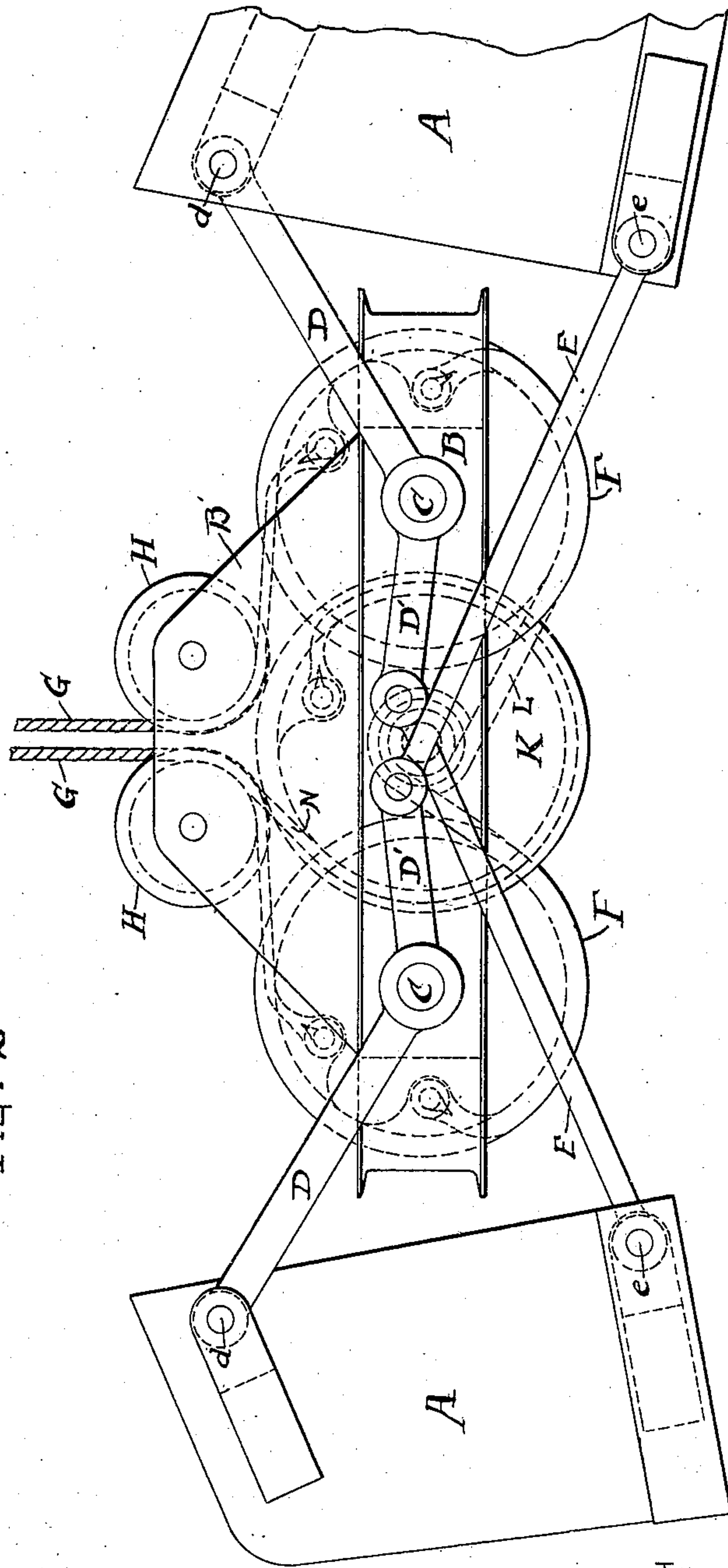
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4 SHEETS—SHEET 2.

FIG. 2



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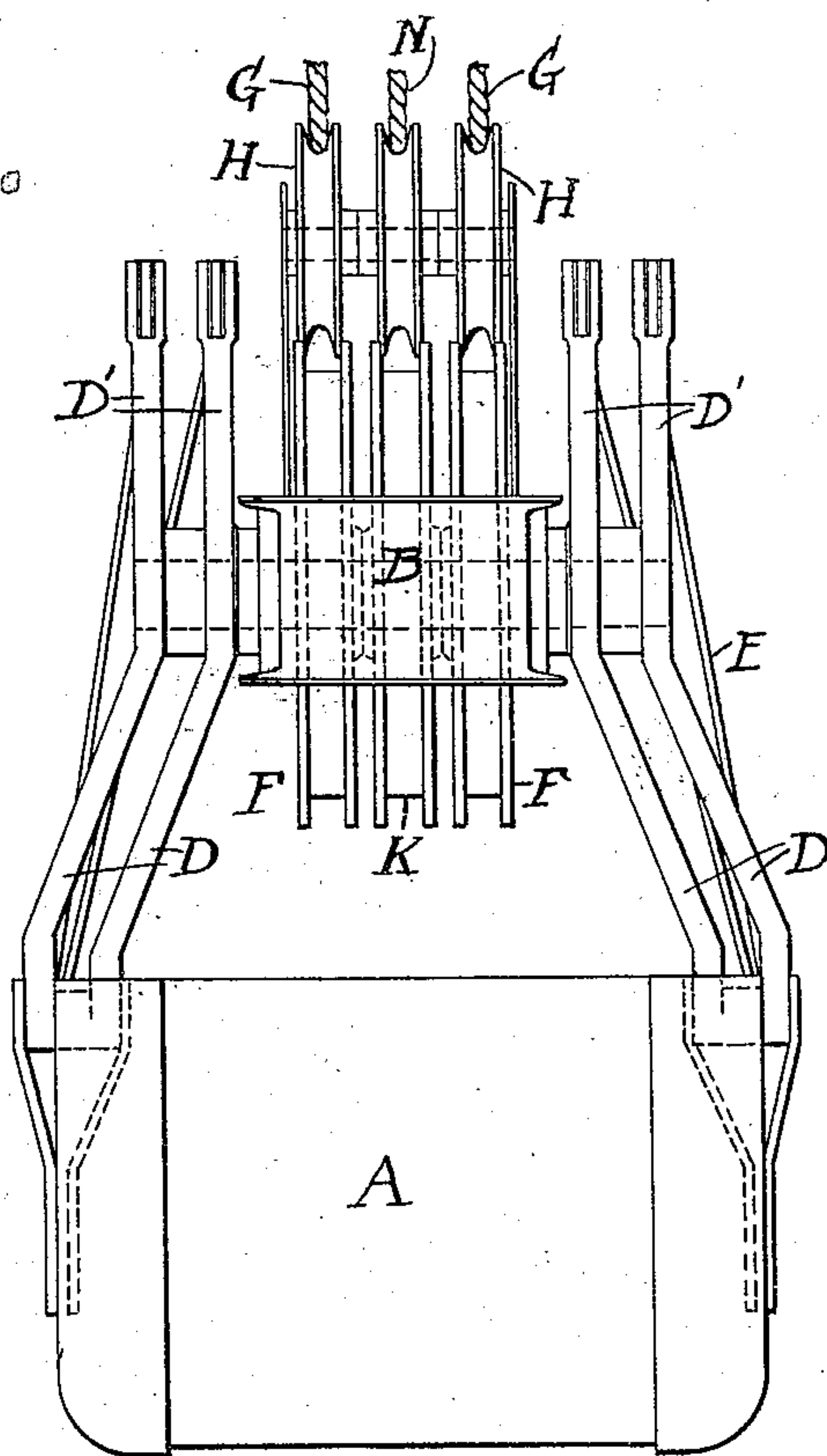
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4 SHEETS—SHEET 3.

FIG. 3



WITNESSES
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4 SHEETS—SHEET 4.

FIG. 4.

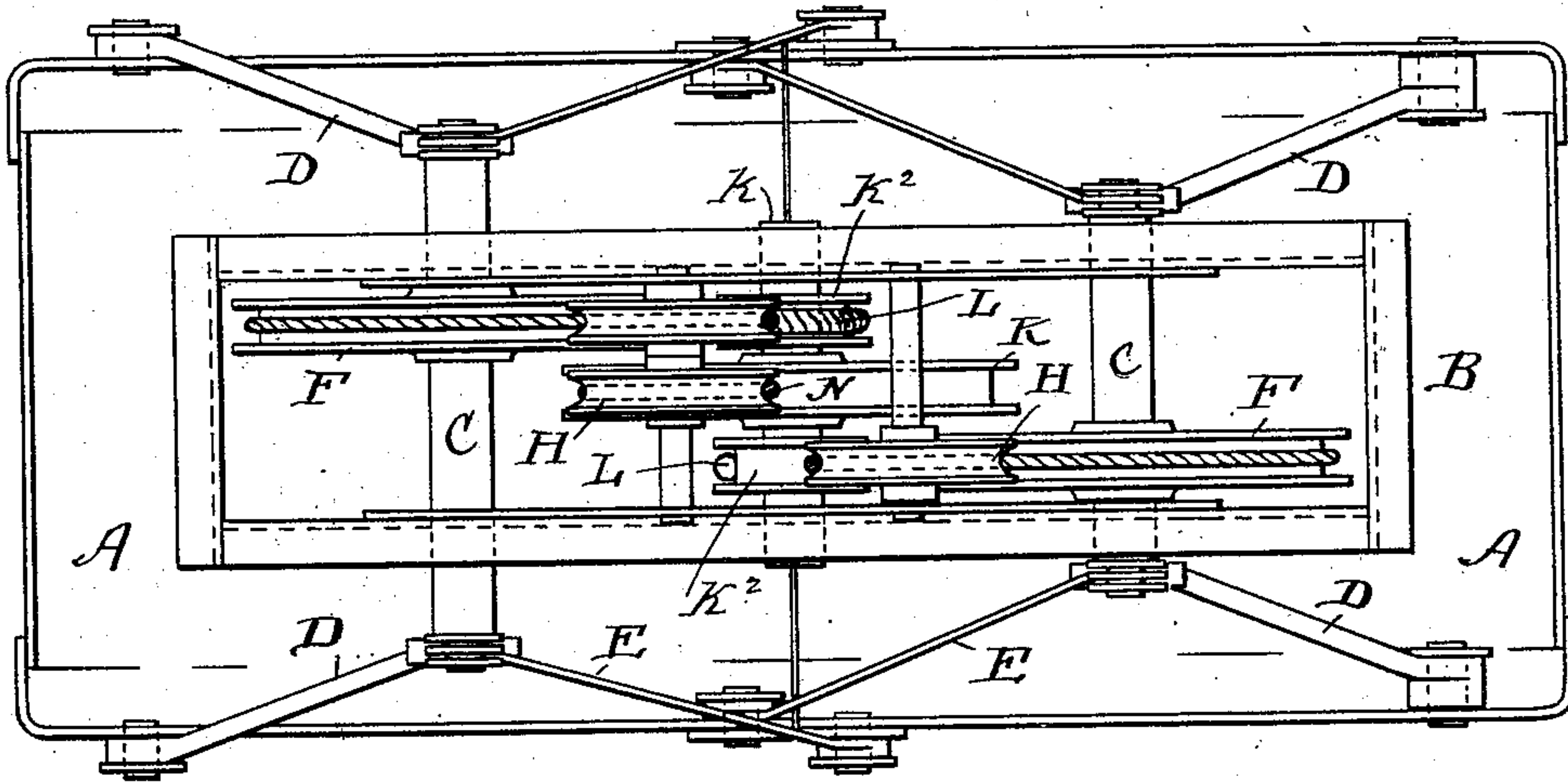
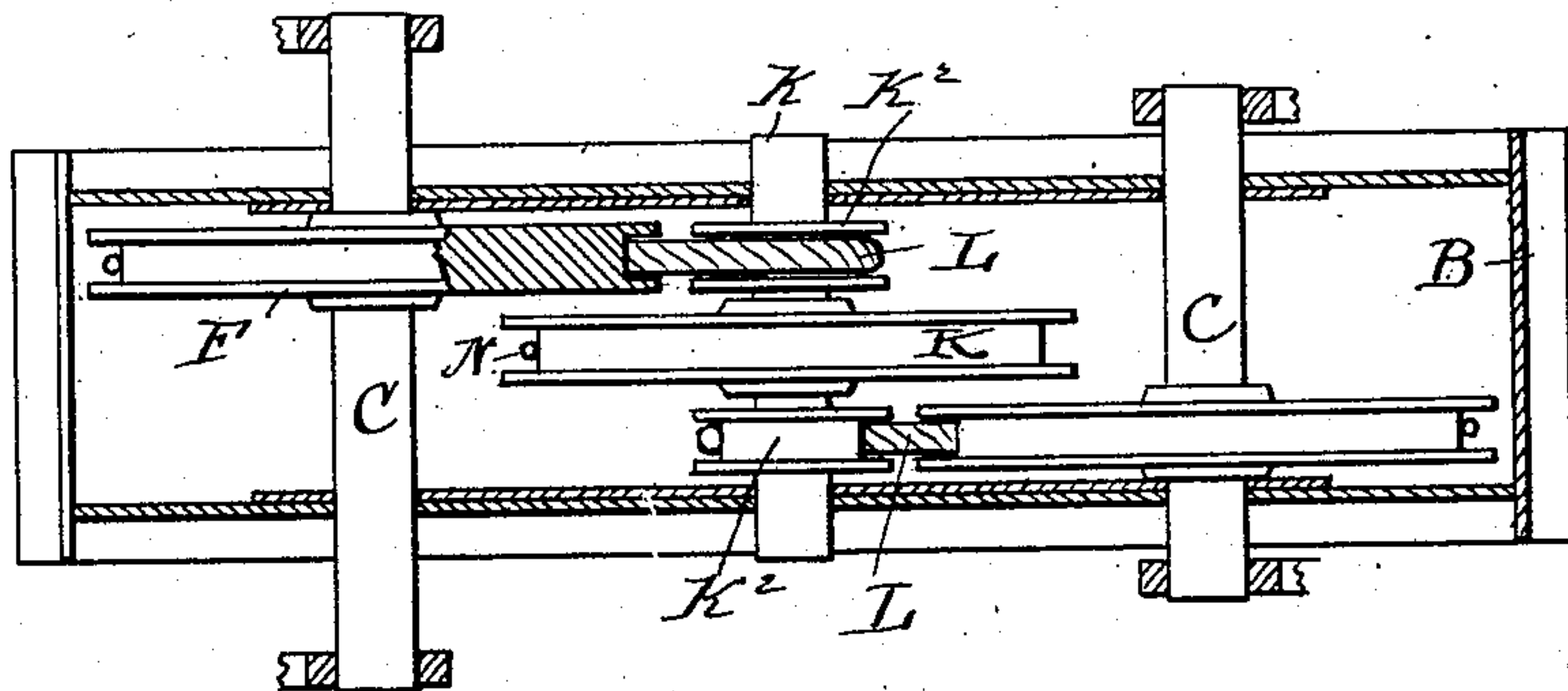


FIG. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK W. LOVELL, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE McMYLER MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF
OHIO.

CLAM-SHELL BUCKET.

No. 919,446.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed January 11, 1904. Serial No. 188,439.

To all whom it may concern:

Be it known that I, FREDERICK W. LOVELL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Clam-Shell Buckets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide in a very simple and efficient form a clam shell bucket of great capacity. The bucket is particularly designed so that the scoops in the open position shall be wide apart and start nearly vertically into the load and then gradually swing into a horizontal position as they approach each other. This enables the scoops as they are approaching to scrape together a large amount of material which they cut beneath and inclose within themselves.

The bucket is especially adaptable for use in unloading ore from vessels on account of the width to which it spreads, and the scraping action it gives to the load, as well as its great capacity.

The invention may be conveniently summarized as consisting of the combination of parts to the above end as hereinafter described and more fully set out in the claims.

In the drawings, Figure 1 is a side elevation of the bucket in its closed position; Fig. 2 is a side elevation of the bucket open; Fig. 3 is an end elevation of the closed bucket, being at right angles to Fig. 1; Fig. 4 is a plan, and Fig. 5 a horizontal section through the operating shafts.

Referring to the parts by letters, A A represent two scoops.

B represents the main frame which is built up of channel beams facing outwardly and connected together so as to form a horizontal box open above and below. Mounted within this main frame are a pair of shafts C C projecting from each side of the frame. Journaled on the projecting ends of these shafts are the four supporting arms D D. These arms run to the rear of the scoops where they are pivoted as shown at *d d*. Extending upward from the arms D D are extensions thereof D' D' which are preferably about vertical when the scoops are closed. Pivoted at the upper ends of the extension arms D' D' are links E E which cross each other and extend to the forward

upper corners of the opposite scoops where they are pivoted as at *e e*. To allow the links E E to conveniently pass each other, one set of them is pivoted to the inner walls of a scoop and the other set to the outer walls. The pivoting at the lower ends of the arms D D is correspondingly arranged.

By the above described construction it will be seen that if the shafts C C, when the bucket is closed are rocked with their upper surfaces moving toward each other, the pivot points *d d* will be drawn outward and upward and the pivot points *e e* outward so that the scoop is swung from a horizontal into an approximately vertical position as shown in Fig. 2. Conversely, if in the open bucket the shafts are rotated in the other direction the scoops are drawn together, first biting down into the load and scraping it together and then cutting under it.

In order to rotate the shafts C C, sheaves F F are rigidly mounted upon them between the side bars of the frame B. Within the grooves of these sheaves are secured the ends of cables G G which pass toward each other and then beneath guide pulleys H H, mounted in an upward extension B' of the frame B. The cables G G pass beneath the pulleys H directly from the upper side of the sheaves F F, wherefore, when the weight of the bucket is on these cables, the downward force of such weight causes the cables to draw inward on the upper side of the sheaves F F rotating them and thereby rotating the shafts C C, so as to swing the scoops apart. This is the position for loading, and it is accomplished by simply allowing the weight of the bucket to be borne entirely by the two cables G G. In order to close the scoops I provide a third sheave K mounted centrally in the frame B and an axle *k* parallel with the shafts C C. The sheaves F F overlap the sheave K, one on the front side thereof and one on the rear side. On opposite sides of the sheave K are drums *k*² which are in longitudinal alinement each with one of the sheaves F F. Connecting each drum *k*² and the corresponding sheave F is a cable L. These cables L L pass to the sheaves F F in the opposite direction to the cables G G so that if the drums *k*² are rotated in the direction to wind up their cables the sheaves F F will be rotated in the direction to close the buckets. This rotation of the drums *k*² is given by the lifting cable N

which passes beneath a guide sheave P and is anchored to the sheave K.

When the open bucket has been dropped into its load the cables G G are slackened and the cable N is drawn upward. This rotates the sheave K, winding up the cables L L and thus rotating the sheaves F F and with them the shafts C C in the direction to bring the scoops together, thus closing the bucket. Thereafter the load is lifted by a continued pull on the cable N. When it is desired to dump the load, the supporting force is transferred from the cable N to the cables G G and the cable N being slackened the bucket at once opens.

I claim:—

1. In a clam shell bucket, the combination, with a head, of a pair of scoops, links pivoted to the front ends of the same, operating arms fulcrumed upon said head, the arms of one scoop being independently mounted from the arms of the other scoop and having members pivoted directly to their respective scoops in the rear of the pivotal points of the links thereof and having other members pivoted to the links of the opposite scoop, and means for operating said arms to open and close said scoops.

2. In a clam shell bucket, the combination, with a head, of a pair of scoops, links pivoted to the fronts of the same, operating arms suitably fulcrumed and having scoop members pivoted directly to their respective scoops in the rear of the pivotal points of the links thereof and having their other members pivoted to the links of the opposite scoop, the links of one scoop in their operation crossing the links of the other, and means for operating said arms to open and close said scoop.

3. In a clam shell bucket, the combination of a frame, a pair of shafts rotatably mounted therein, a pair of scoops, arms secured to said shafts and leading directly to said scoops near one end, said arms having extensions, links connecting said extensions with the other end of the opposite scoop and means for giving said shafts partial rotations, substantially as described.

4. In a clam shell bucket, the combination of a pair of scoops, a main frame, a pair of arms pivoted at their lower ends to the rear ends of said scoops, said arms being rotatably mounted on said frame and having extensions above their axes and links leading from said extensions to the forward corners of the opposite scoops, substantially as described.

5. In a clam shell bucket, in combination, a main frame, arms rotatably mounted therein and extending diagonally outward, a pair of scoops pivoted at their rear ends to the lower ends of said arms, said arms having extensions extending upward from their axes, diagonal links pivoted at their upper

ends to the upper ends of said extensions and pivoted at their lower ends to the inner ends of the opposite scoops, and means for simultaneously swinging the arms in opposite directions, substantially as described.

6. In a clam shell bucket, the combination of a box-like frame, a pair of shafts journaled therein, arms rigidly secured on said shafts on the outer sides of the frame, scoops pivotally secured at one end to the lower ends of said arms, links leading from the arms to the opposite scoop and secured at the other end thereof, and means within the frame for rotating said shafts, substantially as described.

7. In a clam shell bucket, the combination of a frame, a pair of shafts therein, arms on said shafts, scoops pivotally secured at one end to the lower ends of said arms, links leading from the arms to the opposite scoop and secured at the other end thereof, sheaves on said shafts within the frame, and cables for rotating said sheaves to open the bucket, substantially as described.

8. In a clam shell bucket, the combination of a box-like frame, a pair of shafts journaled therein, arms rigidly secured on said shafts on the outer sides of the frame, scoops pivotally secured at one end to the lower ends of said arms, links leading from the arms to the opposite scoop and secured at the other end thereof, sheaves mounted on said shafts within the frame, and cables for rotating said sheaves, substantially as described.

9. In a clam shell bucket, the combination of a main frame, shafts, arms secured on said shafts, scoops pivotally secured at the rear end to the lower ends of said arms, links leading from said arms to the opposite scoop and secured to the other end thereof, a pair of sheaves, means for rotating said sheaves in one direction, a third sheave mounted in said frame, a connection between the same and the two sheaves first mentioned, and means for rotating said third sheave, substantially as described.

10. In a clam shell bucket, the combination of a main frame, scoops, arms suspending the scoops from the frame, a pair of sheaves for operating said arms, a third sheave, a flexible connection between said third sheave and said pair of sheaves for operating the same in one direction, means for operating them in the other direction, and means for rotating said third sheave, substantially as described.

11. In a clam shell bucket, the combination of a main frame, scoops, arms suspending the scoops from the frame, a pair of sheaves for operating said arms, a third sheave, small drums driven thereby, flexible connections between said drums and the periphery of said pair of sheaves for operating the same in one direction, cables taking onto the periphery of said pair of sheaves for operating them in the other direction, and means

for rotating said third sheave, substantially as described.

12. In a clam shell bucket, the combination of a main frame, a pair of shafts mounted in said frame, a pair of sheaves within the frame rigidly mounted on said shafts and out of alinement with each other, a pair of cables for rotating said sheaves, a third sheave mounted within the frame intermediate of the sheaves first mentioned, flexible connections leading from opposite sides of said intermediate sheave to the periphery of said pair of sheaves, a cable for rotating said intermediate sheave, whereby the last mentioned cable rotates said main shafts in one direction and said pair of cables may rotate them in the other direction, and scoops carried by the frame and operated by said shafts, substantially as described.

13. In a clam shell bucket, the combination of a main frame, a pair of shafts carried thereby, a pair of sheaves mounted on said shafts and out of alinement with each other, a pair of cables for rotating said sheaves, a third sheave mounted intermediate of the sheaves first mentioned, flexible connections leading from opposite sides of said intermediate sheave to said pair of sheaves, a cable for rotating said intermediate sheave, arms connected with said pair of sheaves, a pair of scoops connected at one end with the lower end of said arms, and links supporting the other ends of said scoops, substantially as described.

14. In a clam shell bucket, the combination of a main frame, a pair of shafts mounted crosswise of said frame, a pair of sheaves within the frame on said shafts and out of alinement with each other, a third sheave mounted within the frame intermediate of the sheaves first mentioned, and having small drums on its opposite sides, flexible connections leading from said drums to the periphery of said pair of sheaves, a pair of scoops, and operating mechanism between the same and said pair of sheaves, substantially as described.

15. In a clam shell bucket, the combination of a frame, a pair of main sheaves rotatably mounted on said frame, a pair of guide sheaves mounted in the upper extension of said frame, said main sheaves being out of alinement with each other, an intermediate sheave rotatably mounted on said frame out of alinement with the two main sheaves, hubs on the outer sides of said intermediate sheave alining with said main sheaves, flexible connections leading from each hub to the main sheave with which it is in alinement, a third guide pulley in alinement with the intermediate sheave, a pair of scoops, and suitable connections between the same and said main sheaves, substantially as described.

16. In a clam shell bucket, the combination of a main frame consisting of an open

box-like structure, a pair of shafts journaled therein, main sheaves within the frame rigidly mounted upon said shafts, a pair of guide sheaves mounted in the upper extension of said frame, said main sheaves being out of alinement with each other, an intermediate sheave rotatably mounted within said frame out of alinement with the two main sheaves, hubs on the outer sides of said intermediate sheave alining with said main sheaves, flexible connections leading from each hub to the periphery of the main sheave with which it is in alinement, a third guide pulley in alinement with the intermediate sheave, a pair of scoops, four arms rigidly mounted on the projecting ends of said two main shafts respectively and pivoted at their lower ends to one end of the corresponding scoop, each of said arms having extensions upward from the main shafts when the bucket is closed, and four links extending from said upper extensions diagonally and crossing each other and pivoted at their lower ends to the other ends of said scoops, substantially as described.

17. In a clam shell bucket, the combination of a frame, two shafts mounted upon the latter, scoop-members supported from and movable by said shafts, and two driving drums mounted upon said shafts respectively.

18. In a clam shell bucket, the combination of a frame, two shafts mounted upon the latter, two scoop-members supported from and movable by said shafts, and gearing for driving said shafts.

19. In a clam-shell bucket, the combination of a frame, two parallel shafts mounted upon said frame and upon opposite sides thereof, arms rigidly secured to the ends of said shafts respectively, two scoop-members suspended from said arms, and driving drums mounted upon said shafts.

20. In a clam-shell bucket, the combination of a frame, two parallel shafts mounted upon said frame and upon opposite sides thereof, arms secured to the ends of said shafts respectively, each arm having two parts extending from its shaft in different directions, two scoop-members, one part of each arm being connected with one end of the adjacent scoop-member and the other part being connected with the other end of the other scoop-member, and mechanism for driving said shafts.

21. In a clam-shell bucket, the combination of a frame, two parallel shafts mounted upon said frame and upon opposite sides thereof, two scoop-members, and oscillatory members secured to the ends of said shafts respectively, each oscillatory member articulating with the outer end of one scoop-member and connected with the inner end of the other scoop-member.

22. In a clam-shell bucket, the combination

tion of a frame, two parallel shafts mounted in the latter, two scoop-members supported and movable by said shafts, two driving drums connected with and adapted to rotate said shafts respectively and means for rotating said drums simultaneously.

23. In a clam-shell bucket, the combination of a frame, two parallel shafts mounted therein, two driving drums mounted upon said shafts respectively, and two scoop-members suspended from said shafts and movable thereby, the rear end of each scoop-member being pivotally connected with the adjacent driving drum and the front end of each such scoop-member being pivotally connected with the opposite driving drum.

24. In a clam shell bucket, the combination with a pair of scoops, of operating mechanism connected with each scoop at the rear of its forward end, and means connecting the operating mechanism of one scoop with approximately the forward end of the opposite scoop, whereby when the operating mechanisms of the two scoops tend to force them together said means will tend to exert its force in the same direction.

25. In a clam shell bucket, the combination with a pair of scoops of lever arms suitably pivoted and having members pivoted to a point of each scoop at the rear of the forward end thereof, means connecting the operating arm of one scoop with approximately the forward end of the opposite scoop, and means for operating said arms.

26. In a clam shell bucket, the combination with a pair of scoops, of operating levers independently pivoted and having scoop members which are connected to the scoop at a point which is in the rear of its forward end, links connecting the operating arm of one scoop with approximately the forward end of the opposite scoop, and means for rocking said arms.

27. In a clam shell bucket, the combination with a pair of scoops, of lever arms independently pivoted and having members connected with said scoops, links pivoted to the front ends of said scoops, link arm rigid with said lever arms, the link arms of one scoop being connected with the links of the opposite scoop, and means for rocking said lever.

28. In a clam shell bucket, the combination with a pair of scoops, of lever arms suitably pivoted and having scoop members extending downward therefrom and pivoted to the corresponding scoop, link members carried by said lever arms and having links passing to approximately the front end of the opposite scoop, means for rocking said levers to close the bucket, and means for opening the bucket.

29. In a clam shell bucket, the combination with a pair of scoops, of a frame, operating levers independently pivoted to said

frame and having scoop members which extend toward the scoops and are connected therewith, link members carried by said levers and extending away from the scoops, links pivoted to said members and connected to the opposite scoop, and means for rocking said levers.

30. In a clam shell bucket, the combination with a pair of scoops, of a frame, shafts mounted in said frame, operating levers mounted upon said shafts and having scoop members pivoted to the corresponding scoop, link members rigid with said levers, links connected to said members and with the front end of the corresponding scoop, and means for rocking said lever arms.

31. In a clam shell bucket, the combination of a pair of scoops, a pair of oscillatable operating mechanisms, members movable thereby and connecting each of said mechanisms with the corresponding scoop near its rear end, and other members connecting said mechanisms with the opposite scoops near their forward ends respectively.

32. In a clam shell bucket, the combination of a frame, a pair of oscillatable operating mechanisms mounted on said frame, a pair of scoops below said mechanisms, a pair of members operated by said mechanisms respectively and each connected with the rear end of the scoop directly beneath it, and a pair of links each connected with one of said operating mechanisms and each connected with the front end of the scoop opposite to such operating mechanism respectively.

33. In a clam shell bucket, the combination of a frame, a pair of oscillatable operating mechanisms mounted thereon, a pair of scoops, members connecting said operating mechanisms with the rear ends of said scoops respectively, links each connecting the operating mechanism at a point above the pivot thereof when the bucket is closed with the opposite scoop near its forward end, mechanism for simultaneously swinging said operating mechanisms in opposite directions to close the bucket, and a rotatable cable sheave for operating said last mentioned mechanism.

34. In a clam shell bucket, the combination with a pair of scoops of lever arms suitably pivoted and having members pivoted to a point of each scoop at the rear of the forward end thereof, means connecting the operating arm of one scoop with approximately the forward end of the opposite scoop, means for operating said arms to close the bucket, and means for opening the bucket.

35. In a clam shell bucket, the combination with a pair of scoops, of operating mechanisms pivoted at a point in each scoop which is in the rear of the forward end thereof, means connecting the operating mechanism of one scoop with approximately the for-

ward end of the other scoop, means for rocking said operating mechanism to close the bucket, and means for opening said bucket.

36. In a clam shell bucket, the combination with a pair of scoops, of lever arms independently pivoted and having members connected with said scoops, links pivoted to the front ends of said scoops, link arms rigid with said lever arms, the link arms of one scoop being connected with the links of the opposite scoop, and means for rocking said lever arms to close the bucket, and means for opening said bucket.

37. In a clam shell bucket, the combination with a pair of scoops, of operating arms pivoted independently and having scoop members which are connected to the scoop in the rear of their forward ends, link arms rigid with said operating arms, links connecting the link arms with the opposite scoop respectively, and means for rocking said operating arms to close the bucket, and means for opening said bucket.

38. In a clam shell bucket, the combination with a pair of scoops, of a frame, operating levers independently pivoted to said frame and having scoop members which extend diagonally toward the scoops and are connected therewith, link members carried by said levers and extending away from the scoops, links pivoted to said members and connected to the opposite scoop, and means for rocking said levers to close the bucket, and means for opening said bucket.

39. In a clam shell bucket, the combination with a pair of scoops, of a frame, shafts mounted in said frame, operating levers mounted upon said shafts and having scoop members pivoted to the corresponding scoop, link members rigid with said levers, links connected to said members and with the front end of the corresponding scoop, and means for rocking said lever arms to close the bucket, and means for opening said bucket.

40. In a clam shell bucket, the combination with a pair of scoops, of a frame, shafts mounted in said frame, operating levers mounted upon said shafts and having scoop members pivoted to the corresponding scoop, link members rigid with said levers, links connecting said link members and the front end of the opposite scoop, drums carried by said frame, flexible connections between said drums and the operating arms, and means for opening said bucket.

41. In a clam shell bucket, the combination of two scoop members, a pair of opposed operating members and links connecting the front or inner ends of the scoop members with the operating members respectively, the rear or outer ends of said scoop members being also connected with said operating members respectively.

42. In a clam shell bucket, the combination of a frame, two operating members mounted upon said frame upon opposite sides of a given plane, two scoop members on opposite sides of said plane, links connecting the inner or front ends of the scoop members with the opposite operating members respectively, the outer or rear ends of said members being connected with the rear ends of the scoop members on the same side of said plane respectively.

43. In a clam shell bucket, the combination of a frame, a pair of oscillatory members mounted on said frame upon opposite sides of a given plane, two scoop members on opposite sides of said plane, links connecting the one end of each scoop member with the opposite oscillatory member respectively, and means connecting the other end of each scoop member with said oscillatory member respectively.

44. In a clam shell bucket, the combination of two scoop members, a pair of opposed oscillatory members, means engaging the periphery thereof for rocking said members, means connecting the front ends of the scoop members with said oscillatory members respectively, the rear ends of the scoop members being also connected with said oscillatory members.

45. In a clam shell bucket, the combination of two scoop members, a pair of oscillatory members, means connecting each oscillatory member with the opposite scoop and means connecting each oscillatory member with its corresponding scoop.

46. In a clam shell bucket, the combination of a pair of scoops, a pair of levers pivoted at their lower ends to the rear end of said scoops, and a pair of links pivoted at their lower ends to the front ends of said scoops, a frame, means carried thereby for pivoting the upper ends of said levers, each lever continuing beyond its pivot and the upper ends of the links being pivoted to such continuations, and mechanism including a pair of oscillatable members adapted to swing said levers.

47. The combination of a frame, a shaft carried thereby, a lever mounted intermediate of its ends on said shaft, the lever having a comparatively long extension below the shaft and a comparatively short extension above it, a pair of scoops, the lower end of the lever being connected with the rear end of the scoop, and a link connecting the upper end with the forward end of the opposite scoop.

48. The combination of a frame, a shaft extending across it, levers intermediately mounted on the shaft on opposite sides of the frame, downwardly extending links secured to the upper ends of said levers, and scoops, one having its rear end carried by

said levers and the other having its forward end connected with said links.

49. The combination of a frame, a shaft carried thereby, and extending beyond the
5 sides of the frame, downwardly extending arms mounted on said shaft, shorter upwardly extending arms mounted on said shaft, and a pair of scoops one of which has its rear connected with said lower arms and

the other of which has its front connected 10 with said shorter arms.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

FREDERICK W. LOVELL.

Witnesses:

E. L. THURSTON,
E. B. GILCHRIST.