(No Model.) 3 Sheets—Sheet 1.

J. G. WESTBROOK.

DEVICE FOR TRANSMITTING POWER.

No. 540,473. Patented June 4, 1895.

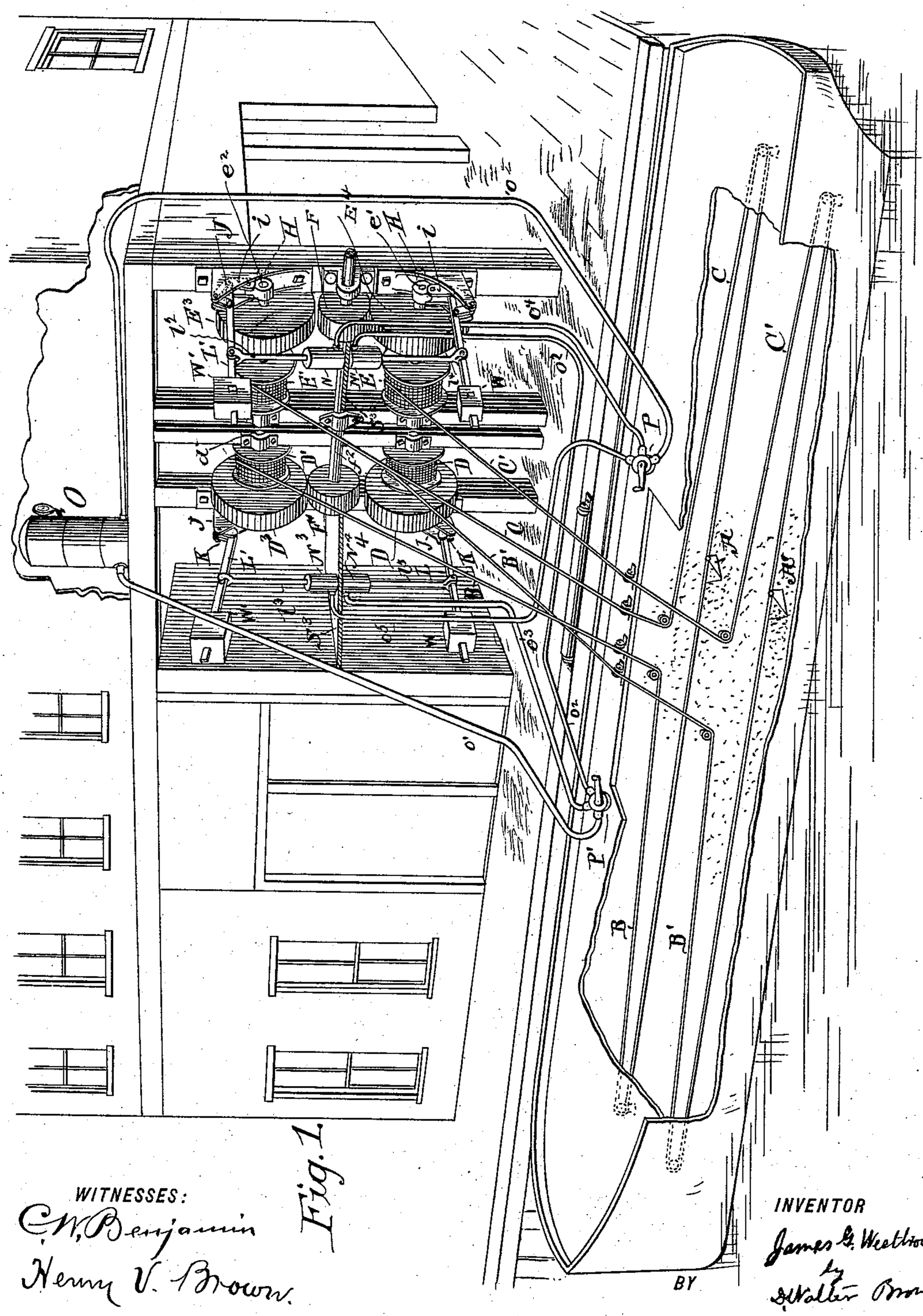

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

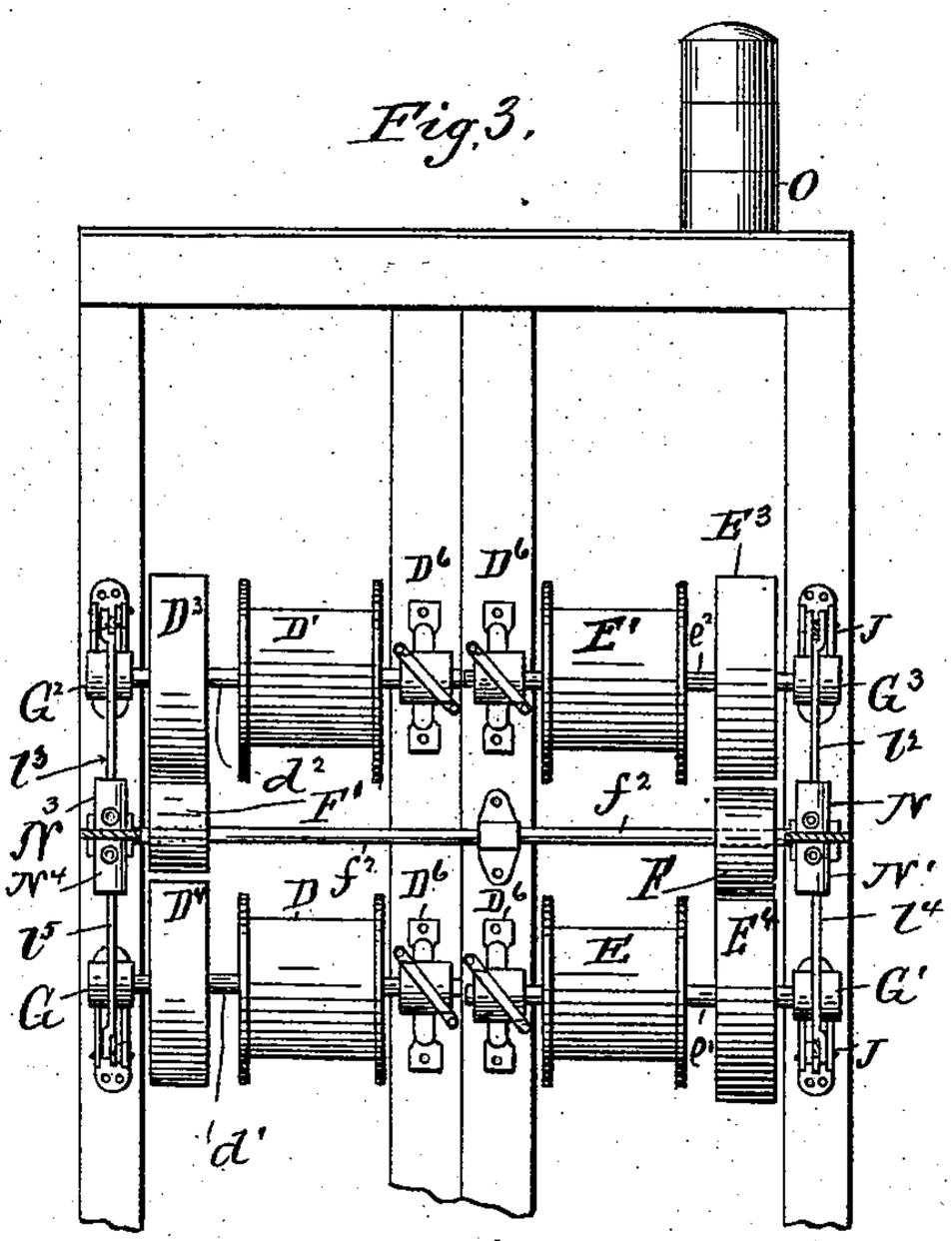


Fig. 2.

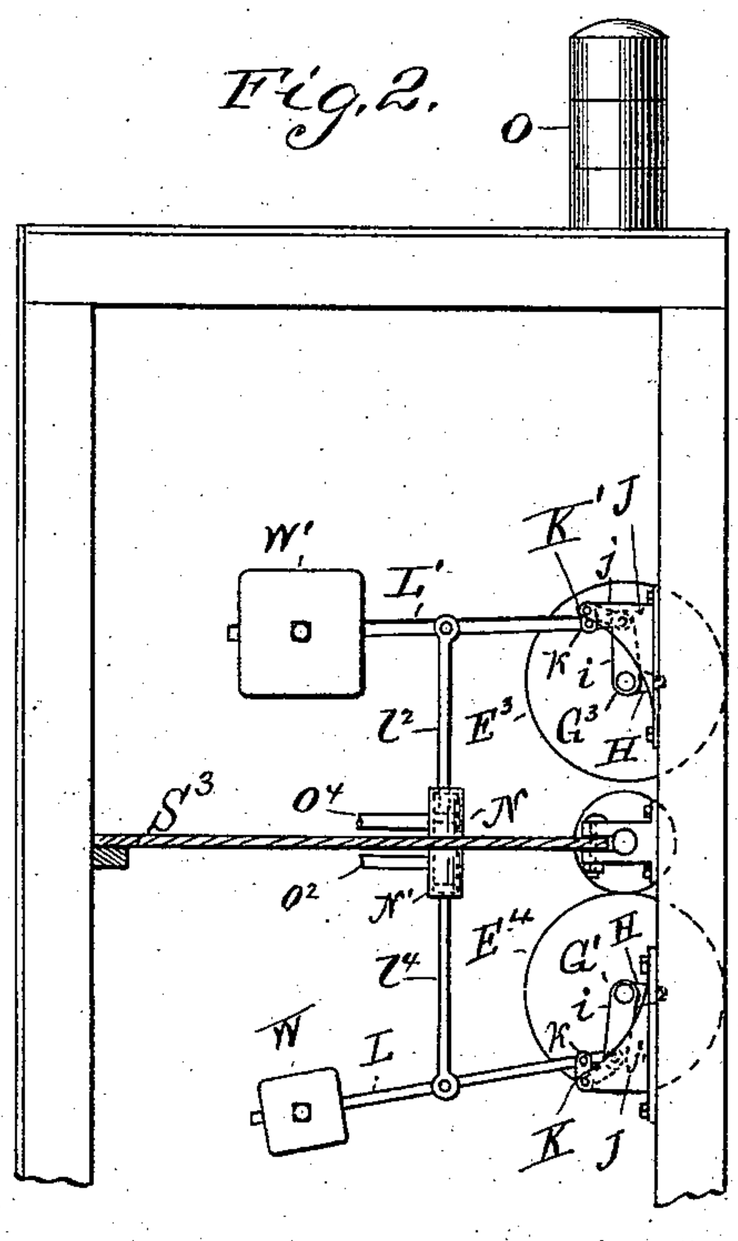
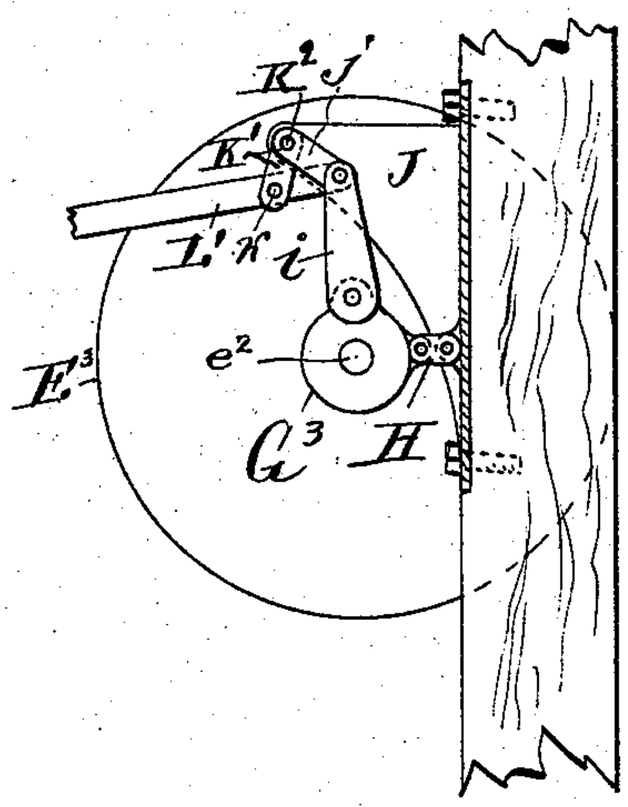


Fig. 2x.



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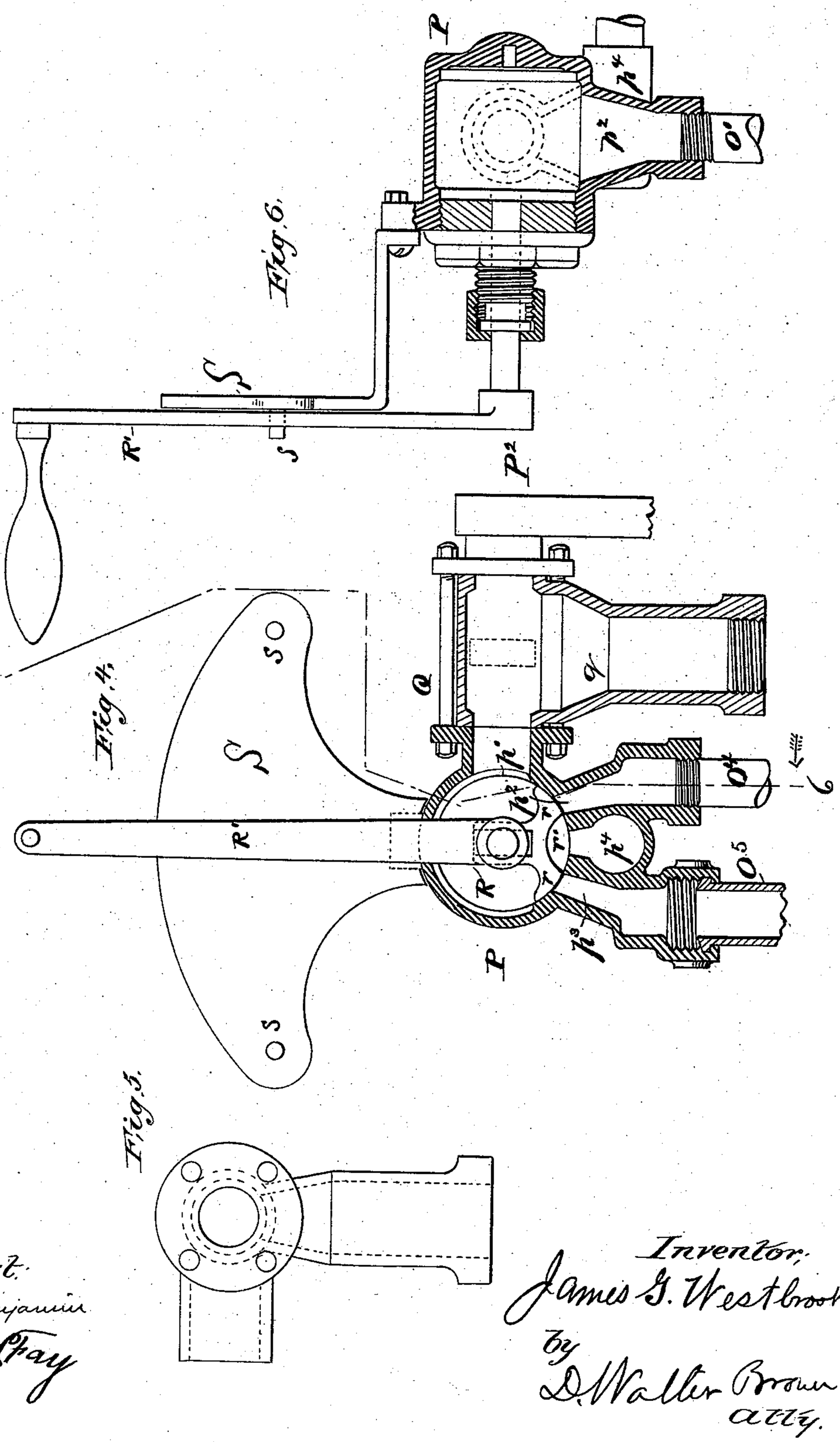

Attest.
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UNITED STATES PATENT OFFICE.

JAMES G. WESTBROOK, OF OGDENSBURG, NEW YORK.

DEVICE FOR TRANSMITTING POWER.

SPECIFICATION forming part of Letters Patent No. 540,473, dated June 4, 1895.

Application filed April 9, 1894. Serial No. 506,976. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. WESTBROOK, a citizen of the United States, and a resident of Ogdensburg, in the county of St. Lawrence, State of New York, have invented a certain new and useful Improvement in Devices for Transmitting Power, of which the following is a specification.

My invention relates to devices for transmitting power by compressed air, steam or other suitable fluids, and is especially intended for use in connection with grain shoveling apparatus, as a substitute for hand labor in connecting the drums, which operate the ropes by which the shovels are actuated, with and disconnecting them from disks on the driving shaft. The invention is, however, also applicable to other purposes.

In grain shoveling apparatus, the shovels are actuated by cables operated by drums or winches that are at a considerable distance from the shovels, the said drums being driven by friction gearing. Heretofore, the connecting with and disconnecting of the drums from the driving disk, has been effected by the attendants pulling ropes which operate levers that connect and disconnect the drums, with and from the disks; but this mode of operating the levers requires the labor of eight men for an ordinary shoveling plant, merely to throw the drums in and out of connection at the proper times. By my invention, however, the drums are connected and disconnected with and from the friction disks by cylinders adjacent to the drums, the pistons of the cylinders being operated by compressed air, or other suitable fluid, and the valves which control the movements of the pistons being separated from the cylinders and placed at the point where the shovels are working, at a distance from the cylinders. Said valves are therefore, under the immediate control of the attendants on the shovels, and are connected with the cylinders by suitable pipes. In this manner a very great saving in the labor required to operate the drums is effected, and there is a corresponding reduction in the cost of shoveling the grain.

My invention, therefore, relates especially to the combination with the shoveling plant of the cylinders for operating the friction gearing of the drums, the valves at a distance from the cylinders, and the connections between the valves and the cylinders.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a perspective view of the invention applied to shoveling grain in the hold of a vessel. Fig. 2 is an end and Fig. 3 a front elevation showing the arrangement of the drums and friction-disks. Fig. $2^{\times}$ is a detailed view of the manner in which the drums are supported. Figs. 4, 5, and 6 are details of one of the valves by which the admission of compressed air to the cylinders is controlled, Fig. 5 being an end elevation of the valve and Fig. 6 a section on the line 6 6 of Fig. 4.

Referring to Figs. 1 to 6, the shovel A is operated to and fro by the cables B C, led respectively around the drums D′ E′, and the shovel A′ is operated by the cables B′ C′, led respectively around the drums D E; said drums D′ E′, D E being respectively fixed on shafts d^2 e^2, and d' e'.

D^3 E^3 are disks, respectively fixed near the ends of the shafts d^2 e^2, D^4 E^4 being similar disks on the shafts d' e'.

The boxes G^2 G^3 of the shafts d^2 e^2, and G G′ of the shafts d' e' are each preferably supported, as indicated in Fig. $2^{\times}$, on the ends of vertical links *i*; H being short powerful links leading horizontally from the said boxes to the brackets J, which are fixed to the timbers of the building. A link *j* pivoted to the bracket J at K^2, is also pivoted to the other end of the said link *i*, and a link K′ also pivoted at K^2, at one extremity, is at the other extremity pivoted to a lever L or L′, at *k*. Finally, the inner end of said lever L or L′, is pivoted to the pivot of the aforesaid links *i* and *j*.

W′ is the counterpoise of the lever L′, and W is the counterpoise of the lever L, counterpoise W′ being heavier than the drum E′ and disk E^3 and their shaft and the counterpoise W being lighter than the drum E and disk E^4 and their shaft.

The inner ends of the shafts d' e', d^2 e^2 are loosely held in boxes D^6, so as to permit of a deflection of the shafts, in the usual manner.

The aforesaid link H may be made integral with the box G^3, or preferably be pivoted to a lug on said box, as shown in Fig. $2^{\times}$, and the link *i* may also be pivoted to a lug on said box.

For each drum D′, E′, there will be a lever L′, and for each drum D E, a lever L as described, and each lever will be connected, in the manner above described, with links *i*, *i*, K′.

S³ is a partition between the upper and lower drums, on which the cylinders N N′ N³ N⁴ are supported and secured.

F′ is a friction disk on a driving shaft f^2, and is adapted to drive the disks D³ D⁴, of the drums D′ D; and F is a similar disk on the other end of said shaft f^2, and adapted to drive the disks E³ E⁴ and their drums, E′ E. The shaft f^2 is driven by any suitable motor, not shown, as a steam engine.

Connected with the aforesaid lever L′ of the right hand drum (Fig. 1) is the piston rod l^2 of a piston working in a cylinder N, and the left hand lever L′, is connected with the piston rod l^3 of a piston working in a cylinder N³. Similarly the lever L of the right hand drum, is connected with the piston rod l^4 of a piston working in the cylinder N′, and the lever L of the left hand drum, is connected with a piston rod l^5 of a piston working in a cylinder N⁴. Said cylinders N N′ N³ N⁴ are each preferably single acting.

The cylinders N N³, are each connected by pipes o^4 o^5 with a port of a valve P, and the cylinders N′ N⁴, are each connected by pipes o^2 o^3 with a port of a similar valve P′, said valves P and P′, being each connected by a pipe, o o' respectively, with a compressed air reservoir O. Each of said valves P and P′ is constructed in the following manner: The valve has four ports, p' p^2 p^3 p^4. In the case of valve P, the port p' is connected with the compressed air pipe o; in the case of the valve P′, with the compressed air pipe o', either directly or through the chamber Q, q being a nozzle connecting with the compressed air pipe o, or o'. The port p^4, in each valve, leads to atmosphere. Port p^2, of valve P connects with the pipe o^4, leading to the cylinder N, and port p^3, connects with the pipe o^5 leading cylinder N³. Of valve P′ the corresponding ports respectively connect with the pipe o^2 leading to the cylinder N′, and the pipe o^3 leading to the cylinder N⁴. P² is a bracket for securing the valve to a frame. The plug R of said valves, is provided with arms, r r, which wipe the surface of the valve body, r' being a chamber between said arms, which, when the valve plug is in the middle position, covers the exhaust port p^4, the arms in this position covering both ports p^2 p^3.

R′ is the valve handle, playing between stops s s of a plate S.

The said valves P P′ will be set in a position which is convenient to the men in charge of the shovels A B, and control the movement of the shovels in the following manner: Suppose the disk D³ of the drum D′, to be engaged by the friction disk F′, the pipe o^5 being in communication through the valve P, with the compressed air pipe o', so that the cylinder N³ forces up the outer end of its lever L′ and lets the disk D³ descend on the friction disk F′; and that the disk E³ of the drum E′, is raised off the friction disk F, the pipe o^4 of said cylinder being in communication with the exhaust port p^4, of the valve P, so that the counterpoise W′ of the right hand lever L′ has raised the disk E³ off the friction disk F. Now it is desired to reverse the motion of the shovel. The attendant throws the handle R′ so as to shift the plug R, and put the pipe o^5 in communication with the exhaust port p^4, and the pipe o^4 in communication with the compressed air pipe o'. Now the cylinder N will lift the right hand lever L′, lowering the disk E³ upon the friction disk F, and the compressed air escaping from the cylinder N³, by the pipe o^5 and the port p^4, the counterpoise W′ will lift the disk D³ off the friction disk F′, and thus the motion of the shovel A will be reversed. In the case of the shovel A′ when the cylinder N⁴ is in communication with the exhaust port p^4 of the valve P′, the drum D being heavier than the counterpoise W, will descend, lowering the disk D⁴ off the friction disk F′. At the same time, the cylinder N′ will be in communication with the compressed air pipe o', through the valve P′, and will depress the outer end of the right hand lever L, raising the disk E³ against the friction disk F.

Now, having described my improvement, I claim as my invention—

1. The combination, in shoveling apparatus, and with the drums and cables for operating the shovels, and friction disk for operating the drums, of a valve at a distance from the drums, a reservoir for compressed fluid, pipes from the reservoir to the valves, cylinders for connecting and disconnecting the drums with and from the friction disk and pipes from the cylinders to the valve, and a plug in the valve for alternately connecting said cylinders with said reservoir and with the exhaust of the valve, substantially as described.

2. In friction gearing, the combination with a driving shaft and friction disks of drums provided with disks adapted to be actuated by said friction disks, cylinders each of which is provided with a piston that is operatively connected with one of said drums and its disk and is arranged to engage said last named disk with one of the friction disks on the driving shaft when the disk of the other drum is disengaged from the other of said driving shaft disks, a reservoir for compressed air, a valve, a pipe from the reservoir to the valve, and a pipe from the valve to each of said cylinders, and said valve arranged to connect one of said cylinders with said reservoir at the same time that the other cylinder is connected with the exhaust port of the valve, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of March, 1894.

JAMES G. WESTBROOK.

Witnesses:
J. H. CARRINGTON,
HOMER RODDEN.