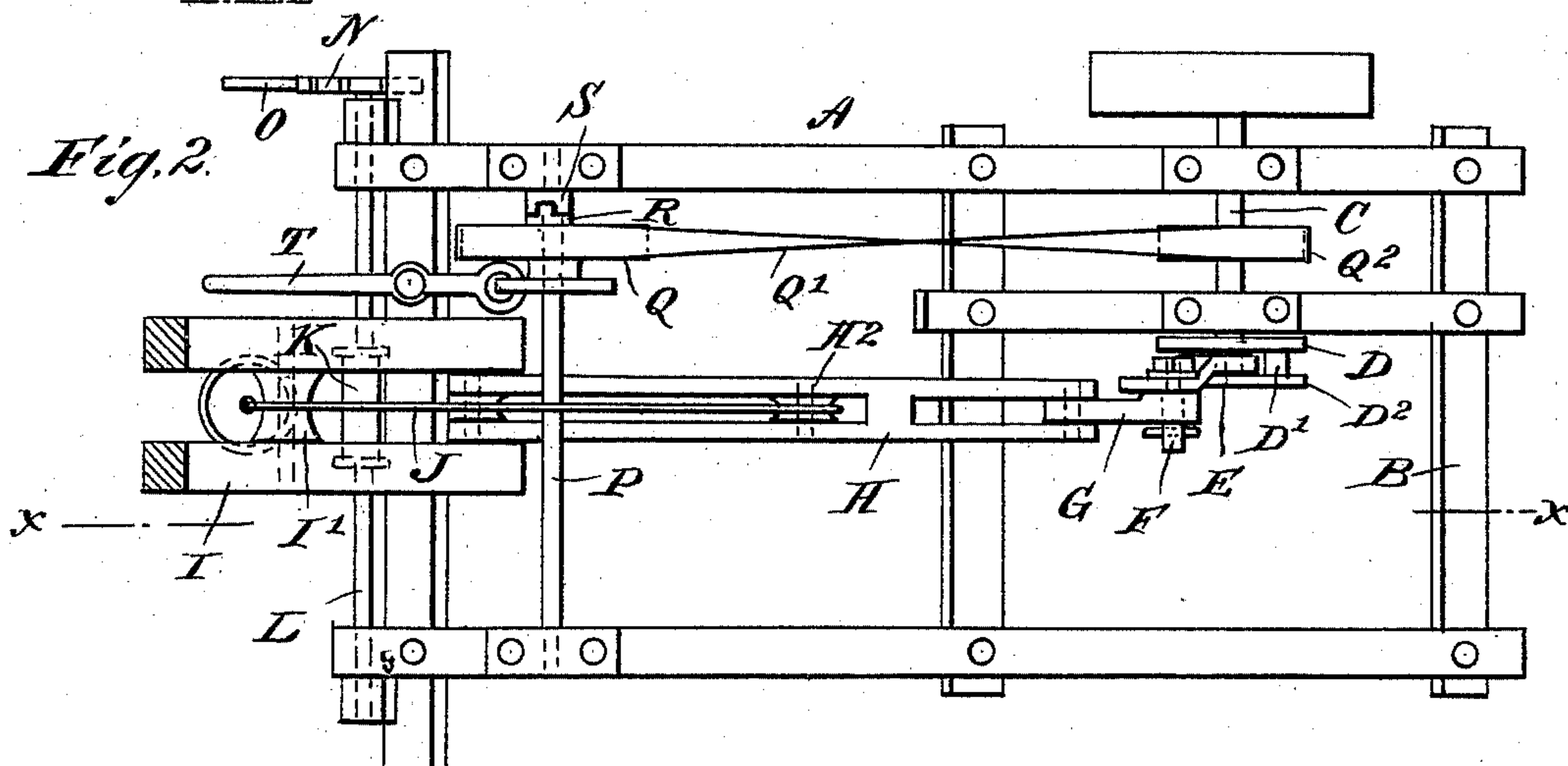
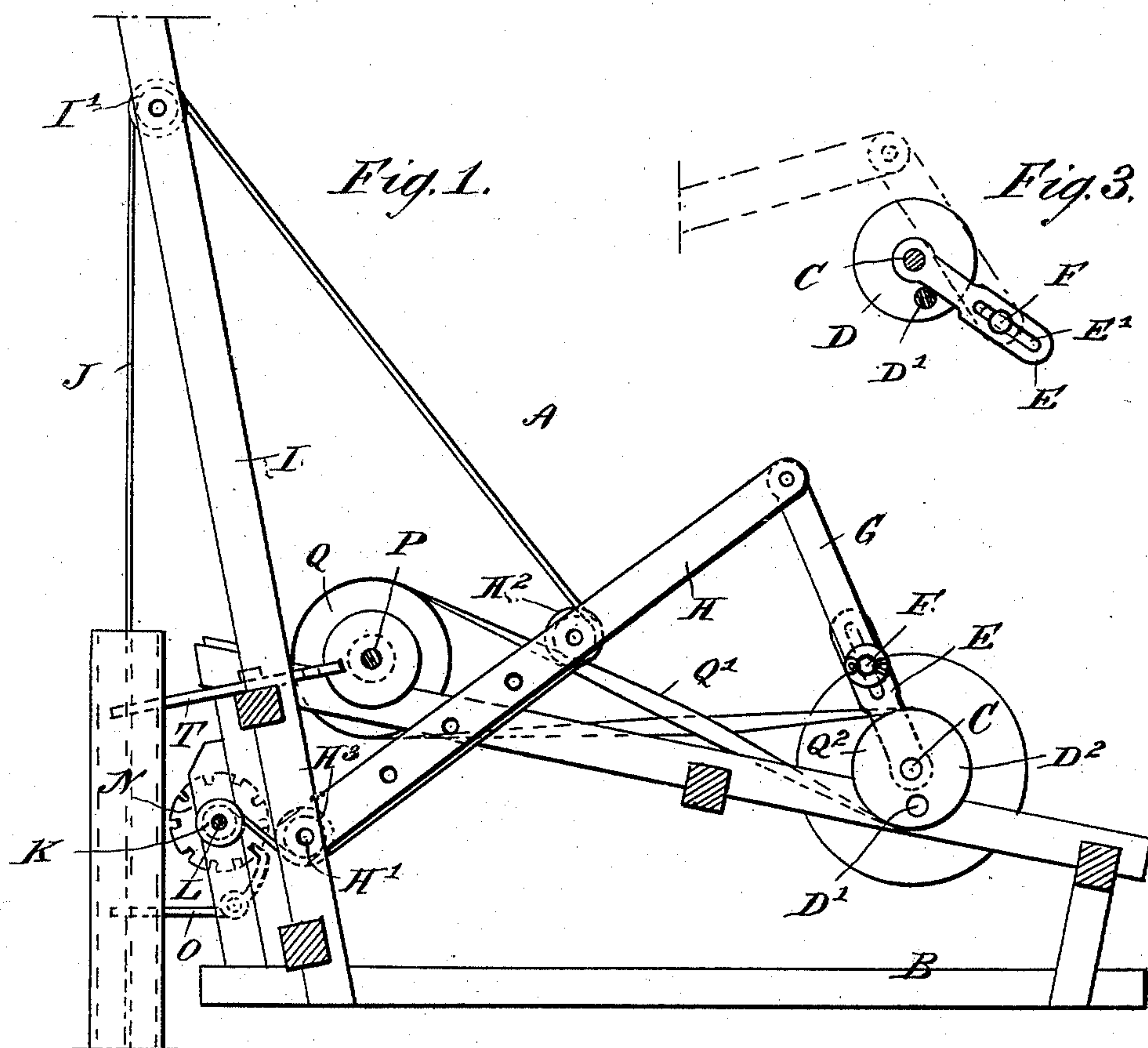


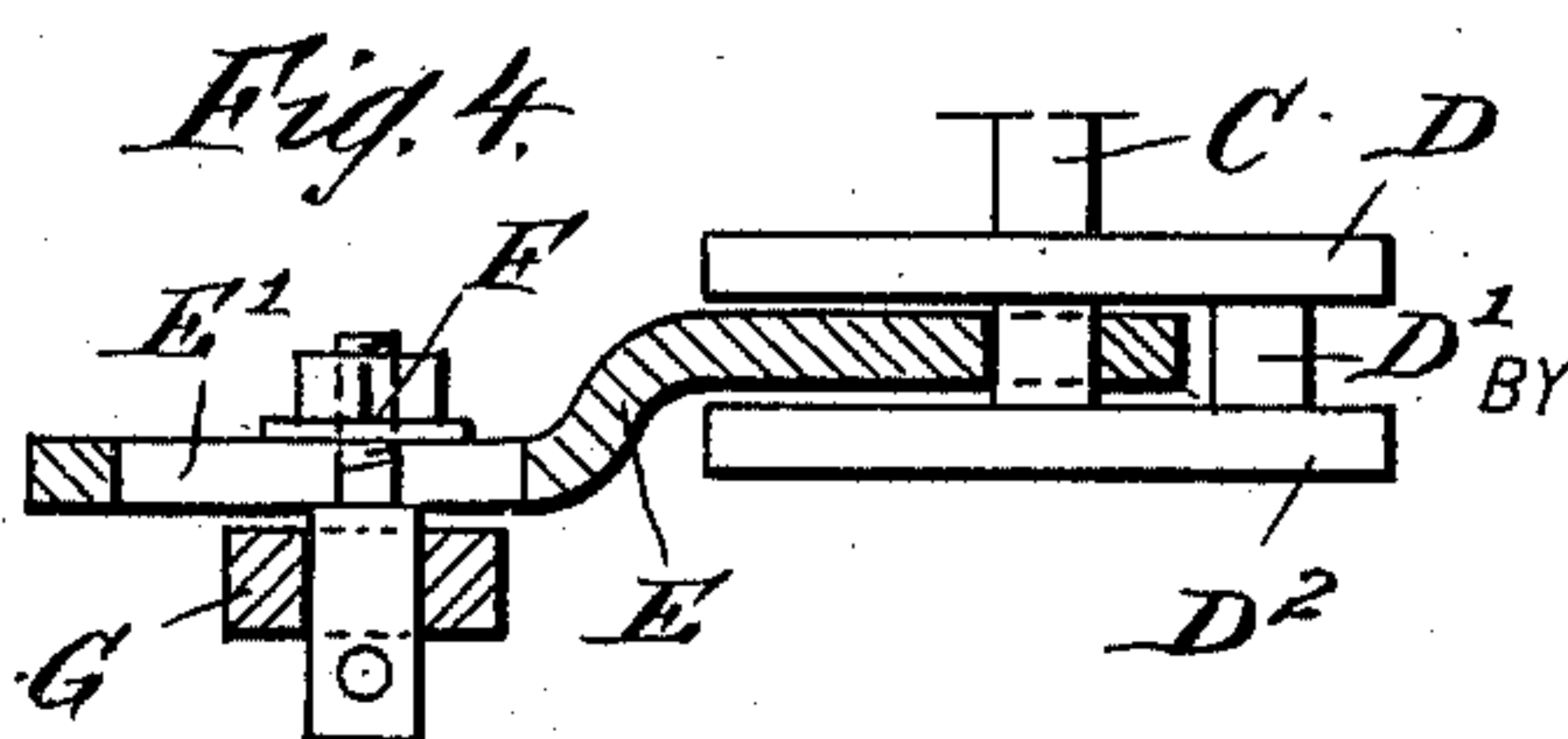
H. H. DAVENPORT & D. A. BROSIUS.
WELL SINKING MACHINE.

Patented Dec. 2, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY H. DAVENPORT AND DALTON A. BROSIUS, OF VERMILLION, SOUTH DAKOTA.

WELL-SINKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 442,021, dated December 2, 1890.

Application filed April 1, 1890. Serial No. 346,147. (No model.)

To all whom it may concern:

Be it known that we, HENRY H. DAVENPORT and DALTON A. BROSIUS, of Vermillion, in the county of Clay and State of South Dakota, have invented a new and Improved Well-Sinking Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved well-sinking machine which is simple and durable in construction and very effective in operation.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line *xx* of Fig. 1. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the crank-disk and crank-arm, and Fig. 4 is an enlarged sectional plan view of the same.

The improved well-sinking machine A is provided with a suitably-constructed frame B, near one end of which is mounted to turn in the suitable bearings the transversely-extending main driving-shaft C, connected by suitable means with machinery to impart a rotary motion to the main driving-shaft C.

On the inner end of the said driving-shaft C is secured a crank-disk D, provided with a crank-pin D', adapted to engage a crank-arm E, fulcrumed loosely on the main driving-shaft C in front of the disk D, which by the crank-pin D' is connected with a second disk D², also secured on the main driving-shaft C, and serving to hold the loose crank E in place. On the free end of the latter is formed a slot E', in which is held adjustable by suitable means a pivot-pin F, connected with a link G, pivotally connected with a lever H, fulcrumed on a rod H', secured in the lower end of a derrick I, erected on the front end of the main frame B.

The derrick I is slightly inclined outwardly, as is plainly shown in Fig. 1, and is provided in its upper end with a pulley I', over which

passes a drill rope or chain J, connected at one end with the usual drilling-tool for sinking the well and adapted to pass from the pulley I' over and around a pulley H², held adjustable in the lever H, to change the drop of the drilling-tool, as is plainly shown in Figs. 1 and 2. The rope J, after passing on the under side of the pulley H², extends along the under side of the lever H, to then pass under a pulley H³, held on the rod H', and then the said rope is wound on a drum K, fastened on a shaft L, extending transversely and mounted to turn in suitable bearings in the front end of the main frame B.

On one end of the shaft L is secured a notched wheel N, adapted to be engaged by a foot-lever O, fulcrumed on the main frame B, and serving to lock the said notched wheel N in place to prevent the drum K from turning until it is desired to do so, which takes place when the operator wishes to lower or feed the rope J to lower the drilling-tool. The well-sinking machine is also provided with a device for quickly raising or lowering the tools, and for this purpose a shaft P is mounted near the front end of the main frame B above the pivot end of the lever H. On this shaft P is held loosely a pulley Q, over which passes a belt Q', also passing over a pulley Q², secured on the main driving-shaft C. A clutch-section R is formed on one face of the said pulley Q, and is adapted to engage a clutch S, secured on the shaft P, so that when the two clutch-sections R and S are in mesh and the main shaft C is rotated a rotary motion is imparted to the shaft P. When the two clutch-sections R and S are disengaged, the shaft P remains stationary, while the pulley Q rotates loosely thereon.

In order to shift the pulley Q in and out of contact with the clutch-section S, a shifting-lever T is provided, fulcrumed on the main frame B. A separate rope may be used for raising and lowering quickly the drilling-tools, the said rope being connected with the shaft P and wound upon the same from the main driving-shaft C, when the pulley Q is in mesh, by its clutch-section R with the clutch-section S. Instead of a separate rope, the rope J can be used for raising and lower-

ing the drilling-tools, the said rope then passing from the pulley I' directly to a drum on the shaft P, to be wound up or unwound from the same, as the case may be. A brake mechanism may be connected with the said shaft P, so as to quickly lower the drilling-tools when the pulley Q is disconnected from the clutch-section S.

The operation is as follows: When the several parts are in place and a rotary motion is imparted to the main driving-shaft C, then the crank-pin D', during one half-revolution, carries along the loosely-fulcrumed crank-arm E, so that the lever H is drawn downward, thereby raising the drilling-tool by means of the rope J. As soon as the crank-arm E has passed the dead-center line in its lowermost position, then the weight of the drilling-tool exerting a pull on the rope J causes an upward swinging movement of the lever H, and a consequent upward swinging of the link G and the loose crank-arm E, which is now free to turn loosely into an uppermost position by being loosely fulcrumed on the main shaft C. The drilling-tool thus strikes with considerable force on the ground. The crank-pin D' follows slowly the rapid upward movement of the crank-arm E, and, finally, again comes in contact with the said crank-arm to carry it downward until the said crank-arm again passes the dead-center line in its lowermost position, to be rapidly drawn upward by the weight of the drilling-tool, as above described. It will thus be seen that whenever the crank-arm E has moved past its dead-center line in the lowermost position the drilling-tool is free to drop onto the ground, thereby sinking the well in the usual manner. By adjusting the pivot-pin F in the crank-arm E, the throw of the lever H can be increased or diminished, as desired, and consequently the drilling-tool will drop a quarter or a less distance. When it is desired to withdraw the drilling-tool from the well, the rope J is fastened with its outer end on the shaft P, and the pulley Q on the latter is thrown in mesh with the clutch-section S, so that the shaft P is rotated from the main driving-shaft C, and the rope J is wound upon the said shaft P to raise the drilling-tools. When it is desired to lower the drilling-tools, the shifting-lever T is actuated to disconnect

the pulley Q from the clutch-section S, so that the shaft P rotates by the pull of the drilling-tools on the rope J, the said shaft being braked by a brake mechanism previously mentioned, to prevent the too rapid turning of the said shaft.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a well-sinking machine, the combination, with a drill-rope and a lever connected with the said drill-rope, of a link pivotally connected with the said lever, a pivot-pin connected with the said link, a crank-arm on which the said pivot-pin is held adjustable, a crank-pin adapted to engage the said crank-lever, and a main driving-shaft carrying the said crank-pin and on which the said crank-lever is loosely fulcrumed, substantially as shown and described.

2. In a well-sinking machine, the combination, with the main driving-shaft, of a crank-pin held on the said main driving-shaft, a crank-arm loosely fulcrumed on the said main driving-shaft and adapted to be operated on by the said crank-pin, a pivot-pin held adjustably in the said crank-arm, a link pivotally connected with the said pivot-pin, a lever pivotally connected at its free end with the said link, a drill-rope held on the said lever, and a feed-drum on which one end of the said drill-rope is secured, substantially as shown and described.

3. A well-sinking machine comprising the frame B, having the standard I, provided with pulley I' at the upper end, the main lever H, pivoted to the lower end of the standard and having a pulley at its pivotal point and a pulley H² between its ends, the winding-drum L, the shaft P, mounted on the frame above lever H, the pulley Q and clutch therefor, the main shaft C, having a crank, a loosely-mounted lever operated thereby, and a link pivotally connected to said lever and to the upper end of the lever H, substantially as set forth.

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Witnesses:

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