

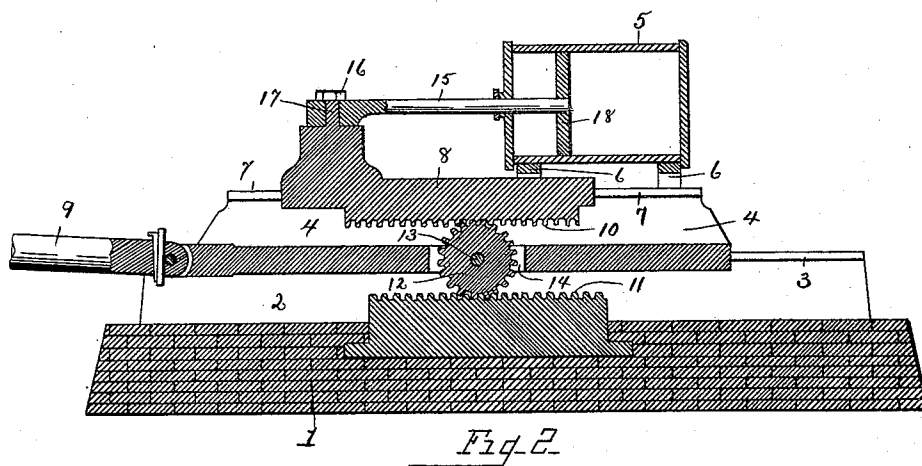
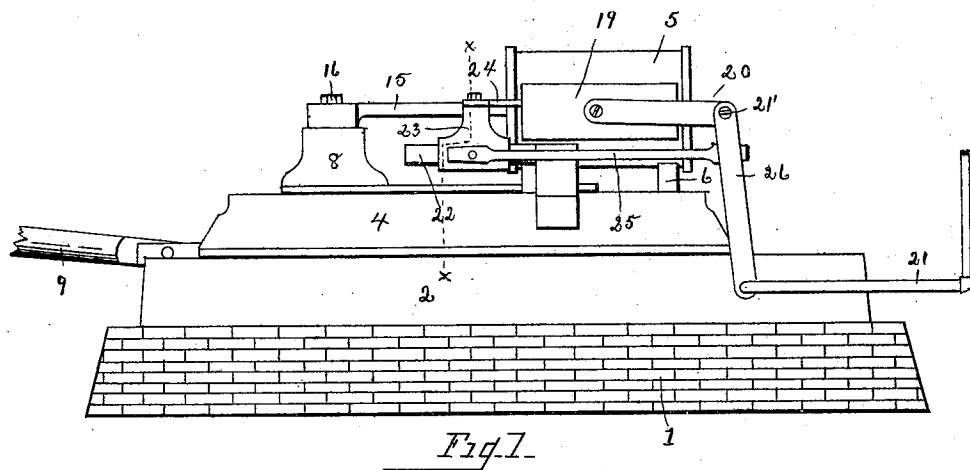
(No Model.)

2 Sheets—Sheet 1.

F. P. HUMMEL.
MECHANICAL MOVEMENT.

No. 478,795.

Patented July 12, 1892.



WITNESSES

Carroll J. Webster.
Grace E. Lantry

INVENTOR

Franklin P. Hummel
By William Webster
Atty.

(No Model.)

2 Sheets—Sheet 2.

F. P. HUMMEL.
MECHANICAL MOVEMENT.

No. 478,795.

Patented July 12, 1892.

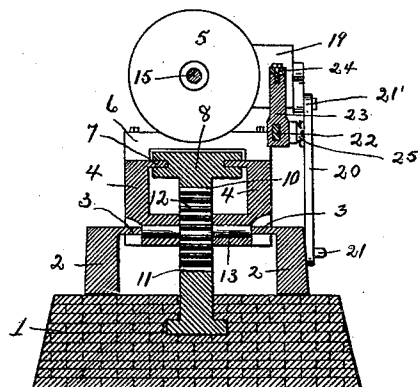


Fig. 3.

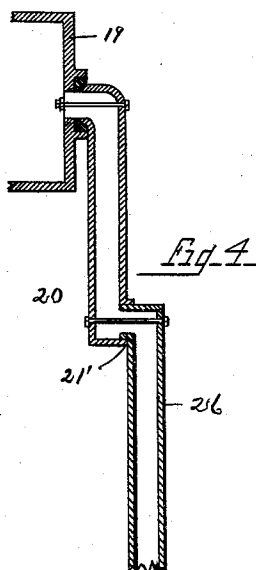


Fig. 4.

WITNESSES

Carroll J. Webster.

Grace C. Lehaney.

INVENTOR

Franklin P. Hummel

By

William Webster
Atty.

UNITED STATES PATENT OFFICE.

FRANKLIN P. HUMMEL, OF BLISSFIELD, MICHIGAN.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 478,795, dated July 12, 1892.

Application filed January 12, 1892. Serial No. 417,779. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN P. HUMMEL, of Blissfield, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Mechanical Movements; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to a mechanical movement, and has especial relation to that branch of the art in which a minimum amount of power is required to perform a maximum amount of work.

The invention more especially relates to a mechanical movement which is designed to be placed between the point of power and the point of application.

The object of the invention is to provide a mechanical movement of few parts and of few wearing points that shall attach to the point of power and either decrease the amount of power required to perform a certain work or increase the power at the point of application of the device to perform an increased amount of work.

With these objects in view the invention consists in the parts and combination of parts of a mechanical movement, as will be hereinafter shown in the drawings, described in the specification, and pointed out in the claims.

In the drawings I have shown the movement as applied to an engine, it being apparent that I may also employ the same with any device or mechanism where the power is employed to perform the work without departing from the spirit of my invention.

In the drawings, Figure 1 is a side elevation of an engine constructed in accordance to my invention. Fig. 2 is a longitudinal vertical section of the same, showing its internal working parts. Fig. 3 is a transverse section on lines *x x*, Fig. 1. Fig. 4 is a detail view of the jointed steam-pipe for supplying steam to the steam-chest.

1 designates the foundation of the engine, on which rests the bed 2, which is constructed with guides 3, extending its entire length, on

which slides the cylinder-bed 4, one end of which is secured to the cylinder 5 by means of lugs or arms 6, said bed 4 having guides 7 extending its entire length, on which works the piston-slide 8. On the opposite end of the cylinder-bed 4 to that on which the cylinder is secured is attached the pitman-rod 9, leading to any device or mechanism to be operated.

10 designates a rack-bar, either integral or attached to the under side of the piston-slide 8, and 11 designates a similar rack-bar secured in the foundation 1, there being a pinion 12, journaled on shaft 13, secured in the cylinder-bed 4, said pinion running in slot 14 in the bed-plate.

15 designates the piston-rod, one end being securely attached to the piston-slide by means of nut 16, on an integral bolt or bearing 17, the opposite end of the piston-rod carrying a piston-head 18, the cylinder, steam-chest 19, and internal working parts being of any preferred form, and not being a part of this invention need no further description.

20 designates a pipe, one end being pivotally secured to the entrance part of the steam-chest, the opposite end being pivotally secured to a pipe 26, at which point the steam-pipe 21 is attached, said pipe 20 having steam-tight joints, for a purpose to be hereinafter explained.

22 designates a longitudinal arm secured to a lug on the cylinder-bed 4, on which arm works a slide 23, to the upper side of which is securely attached the valve-rod 24.

25 designates a lever connecting the slide 23 and section 26 of the jointed steam-pipe. The steam will enter one of the parts of the cylinder (the parts are not shown or explained in detail as they are the ordinary or any preferred form, as has been described) moving the piston-head 18 either forward or backward, as the case may be, also the piston-rod 15, and consequently the piston-slide 8, the rack-bar 10 of which, by meshing with the pinion 12, will revolve the pinion, which, engaging at its lower side with stationary rack-bar 11, will cause the pinion, and consequently the cylinder-bed 4, in which it is journaled, to move forward the same distance as the piston stroke. This operation will cause the section 26 of jointed pipe 20 to also move

forward—that is, the upper end of the same—the lower end being stationary and working on a pivot, which forward movement will cause the slide 23 to move forward by means of the lever connecting it and the upper end of section 26 of the pipe 20 until the full stroke of the piston is made, when the opposite part of the valve-chamber will be opened and the operation will be reversed and continued. It will thus be seen that the cylinder-bed 4, carrying the pitman, will make the same length of stroke of the piston-rod 15; but the piston-rod 15 will move forward the same length of stroke of the bed-cylinder 4 also the distance the cylinder-bed 4 moves as it travels therewith, the cylinder being secured thereto without variation of steam-supply to the cylinder. It will further be seen that by the loss of motion in the movement of the cylinder with the pitman the same amount of steam yields a greater power than with the direct-acting engine by reason of the pinion 12, which not only acts to increase the leverage, the lower rack-bar acting as a fulcrum and the upper rack-bar as a power, the shaft 13 being the weight, and on the principle of a lever the amount of power applied at the upper end will be increased at the point of weight or on the shaft 13, and consequently on the pitman, and that by having a moving fulcrum I do away with the friction and overcome any dead-center. It will also be seen that I may use the same for an electric motor by placing the motor where I have the steam-cylinder, it being understood that my mechanical movement is applied as an intermediate device between the power and application. It will also be seen that I do away with

the wear on the piston by securely attaching the same to the piston-slide.

What I claim is—

1. In a mechanical movement, an upper movable piston-slide provided with a rack-bar, a lower stationary rack-bar, and a cylinder-bed movable between the two, and a pinion carried thereby engaging the rack-bars.

2. In a mechanical movement, an upper piston-slide provided with a rack-bar, a lower stationary rack-bar, and a bed intermediate the two, a pinion carried thereby and engaging the rack-bars, a power device upon the bed, and a piston-rod connecting the same and the piston-slide.

3. In a mechanical movement, a power device, a piston, and rod, a piston-slide attached thereto and provided with a rack-bar, a lower stationary rack-bar, a cylinder-bed intermediate the two, and a pinion meshing with the two rack-bars, said intermediate cylinder-bed being connected to the device to be operated.

4. In a mechanical movement, an upper piston-slide, a rack-bar secured thereon, a lower stationary rack-bar, an intermediate cylinder-bed, a power device secured thereon, and means for applying the power to the upper piston-slide, a pinion meshing with the two rack-bars, and means for connecting the intermediate cylinder-bed with the device to be operated.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

FRANKLIN P. HUMMEL.

Witnesses:

WILLIAM WEBSTER,
CARROLL J. WEBSTER.