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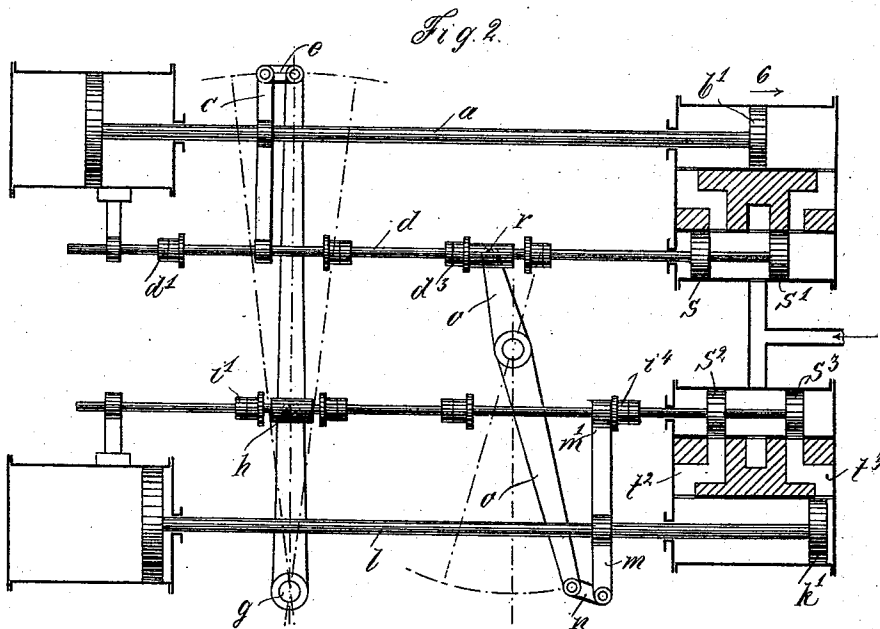
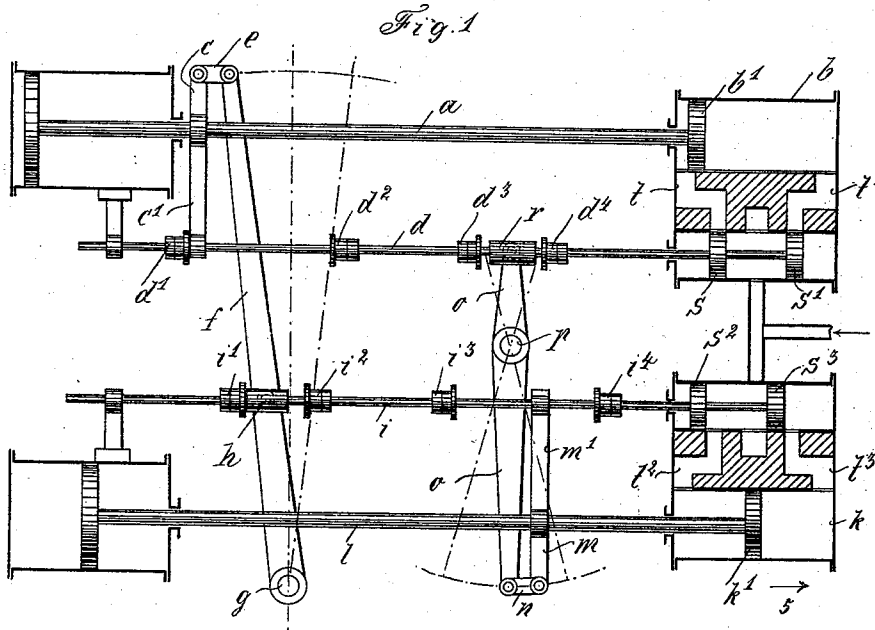
2 Sheets—Sheet 1.

E. KASELOWSKY.

DISTRIBUTING MOTION FOR DOUBLE OR MULTIPLE WATER
PRESSURE ENGINES.

No. 534,747.

Patented Feb. 26, 1895.



Witnesses:

Arthur Watter.
R. Herpich.

Inventor:
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(No Model.)

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Fig. 3.

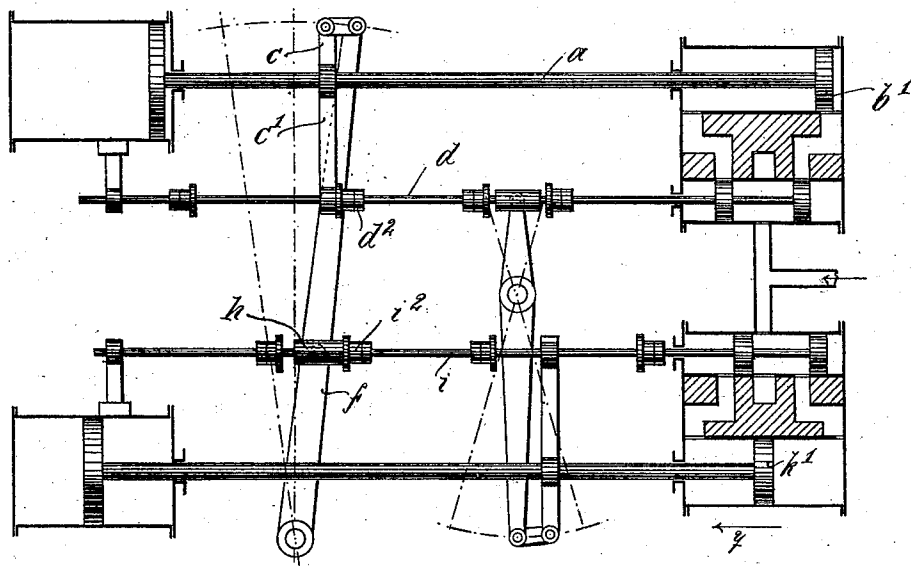
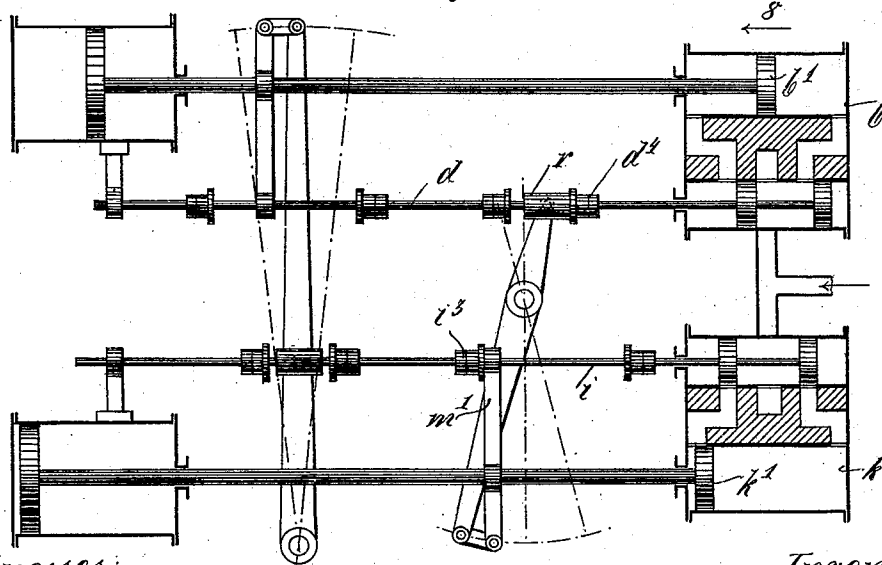


Fig. 4.



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UNITED STATES PATENT OFFICE.

EMIL KASELOWSKY, OF BERLIN, GERMANY.

DISTRIBUTING-MOTION FOR DOUBLE OR MULTIPLE WATER-PRESSURE ENGINES.

SPECIFICATION forming part of Letters Patent No. 534,747, dated February 26, 1895.

Application filed June 23, 1894. Serial No. 515,548. (No model.) Patented in England December 29, 1893, No. 24,980.

To all whom it may concern:

Be it known that I, EMIL KASELOWSKY, a subject of the King of Prussia, German Emperor, and a resident of Berlin, in the Kingdom of Prussia, German Empire, have invented an Improved Distributing-Motion for Double or Multiple Water-Pressure Engines, (for which a patent has been obtained in Great Britain, No. 24,980, dated December 29, 1893,) of which the following is an exact specification.

This invention relates to an improved distributing-motion or valve-motion for use in double and multiple water-pressure engines, and the object of this invention is to avoid in such engines the employment of complicated mechanisms for effecting the distribution of the pressure-water in the two or more cylinders. The improved valve-motion is characterized by its peculiar mode of operation, which, briefly stated beforehand, consists in displacing the water-valves to their position of rest, *i. e.* to their middle position by the movement of the piston of that cylinder, to which said valves belong, and in then displacing the latter farther in the same direction by means of the movement of the other piston, so that the direction of movement of the former piston is reversed thereby. The advantage gained by this manner of working, besides the simplicity of construction requisite therefor, is, that always at least one cylinder is open to receive the pressure-water during the time in which the other cylinder or cylinders is or are closed or in its or their position of rest, so that shocks, which would occur by checking the motion of the water, and which could cause a break-down or destruction of the engine, are effectively prevented.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figures 1 to 4 show plans of a double water-pressure engine provided with my improved valve-motion, the cylinder as well as the valve-boxes being shown in section.

The construction is as follows:—The piston-rod *a* (Fig. 1) of the piston *b'* of cylinder *b* has fixed to it the cross-bar *c c'*, the arm *c'* of which embraces with its end the valve-rod *d*, and is adapted to push alternately on two

tappets *d' d''* secured to said rod *d*. Arm *c* of cross-bar *c c'* is connected by means of a link *e* with a lever *f* fulcrumed at *g*. Said lever carries a sleeve *h* embracing the valve-rod *i* belonging to cylinder *k*, the sleeve being adapted to push alternately against two tappets *i' i''* fixed to said rod *i*. The piston-rod *l* of piston *k'* of cylinder *k* has secured to it a cross-bar *m m'*, arm *m'* of this bar being adapted to push alternately on two tappets *i' i''* also fixed to valve-rod *i*, the other arm *m* being hinged by a link *n* to a double-armed lever *o* fulcrumed at *p*. Lever *o* carries at the end of its shorter arm a sleeve *r* embracing the valve-rod *d*, this sleeve being adapted to act on the tappets *d' d''* also fixed to said rod *d*. This construction, now, works in the following manner:

Suppose, piston *b'* has reached its left-hand end position, Fig. 1, the arm *c'* of cross-bar *c c'* has pushed shortly before on tappet *d'*, and has, thus, caused a displacement of valve-rod *d*, so that the slide-valves *s s'* belonging to cylinder *b* have got their middle-positions and have, thus, closed the water-ways *t t'*; piston *b'*, consequently, is now in its position of rest. Simultaneously, however, with valve-rod *d*, the other valve-rod *i* has been displaced in the same direction by the impact of sleeve *h* on tappet *i'*, sleeve *h* having been moved from arm *c* of cross-bar *c c'* by link *e* and lever *f*. The slide-valves *s' s''* of cylinder *k*, which had kept the channels *t' t''* closed *i. e.* which had been in their middle-position, have been moved then to the left by rod *i*, so that said channels *t' t''* are opened, and piston *k'* is moved from left to right, as indicated by arrow 5 in Fig. 1. As soon, now, as piston *k'* has reached the right-hand end of its path, Fig. 2, the valves *s' s''* are displaced anew by the impact of arm *m'* of cross-bar *m m'* on the tappet *i'*, the extent of displacement being such, that the channels *t' t''* are closed, and piston *k'*, thus, comes again to rest. Valve-rod *d* has been displaced at the same time by the influence of sleeve *r* on tappet *d'*, the sleeve having been moved from arm *m* of cross-bar *m m'* by link *n* and lever *o*, and the valves *s s'* are, thus, brought to their left-hand end-position, so that piston *b'* is set into motion in the direction of arrow 6, Fig. 2. If, now, this piston *b'* arrives at the end of this

stroke, as shown in Fig. 3, the cross-bar *c c'* is moved by piston-rod *a* in such a way, that arm *c'* pushes against tappet *d²* of valve-rod *d*, and that at the same time sleeve *h* of lever *f* pushes against tappet *i²* of valve-rod *i*. Both valve-rods are displaced thereby in the same direction, and the valves are brought from the position shown in Fig. 2, into that shown in Fig. 3, so that piston *b'* is set at rest, and piston *k'* is set into motion, the latter piston moving then in the direction of arrow 7. Piston *k'* having reached the end of its path, Fig. 4, causes the valve-rod *i* to be displaced by the impact of arm *m'* on tappet *i³*, and causes also the valve-rod *d* to be displaced by the impact of sleeve *r* on tappet *d⁴*, so that the valves are moved now in such a way, that the pressure-water is hindered from entering cylinder *k*, and is led into cylinder *b*. Piston *b'* of this cylinder then moves in the direction of the arrow 8. This piston *b'* after having finished its stroke is again in the position represented in Fig. 1, and all the various movements and reversions of directions repeated now in exactly the same order as are above described, from which results, that no other or more complicated mechanisms are necessary for affording a secure and reliable working of the engine.

By altering the distance between the two tappets working together with one cross-bar, I may alter the lengths of the strokes, so that the engine may be adjusted to the power at command, or to the amount of work required; and by altering the position of the tappets with regard to the valve-rods, I may cause one piston to begin its movement, or to have moved already a certain distance, before the other piston comes to rest, so that the pressure-water is actually in constant motion, and no dead end-play with its noxious results can happen.

I wish it to be understood, that I do not confine myself to the employment of my improved distributing-motion in engines with but two cylinders, as shown in the drawings. The same may be used with just the same advantage also in multiple engines, and the configuration and arrangement of the valves and of the organs for effecting the proper movement of the latter may vary according to the type of engine.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States, is—

In a duplex or multiplex water pressure engine, the combination with the motor-cylinder-valves adapted to be displaced in two stages at each stroke of the engine, and with the motor-cylinder valve-rods having each two pairs of tappets, of levers connected one to each piston-rod, and adapted each to displace the valves of another motor cylinder so as to open the valves of the same by acting on one pair of the tappets of the respective valve-rod, and of cross-arms attached also one to each piston-rod, and adapted each to displace the valves of the respective motor-cylinder so as to close the valves of the same by acting on the other pair of the tappets of the respective rod, said two pairs of tappets of each valve-rod being arranged so as to be adapted one to be acted on first by the cross-arm of the respective piston-rod, and thereafter in the same direction, the other by the lever of another motor-cylinder piston-rod, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EMIL KASELOWSKY.

Witnesses:

W. HAUPT,
R. HERPICK.