

No. 671,455.

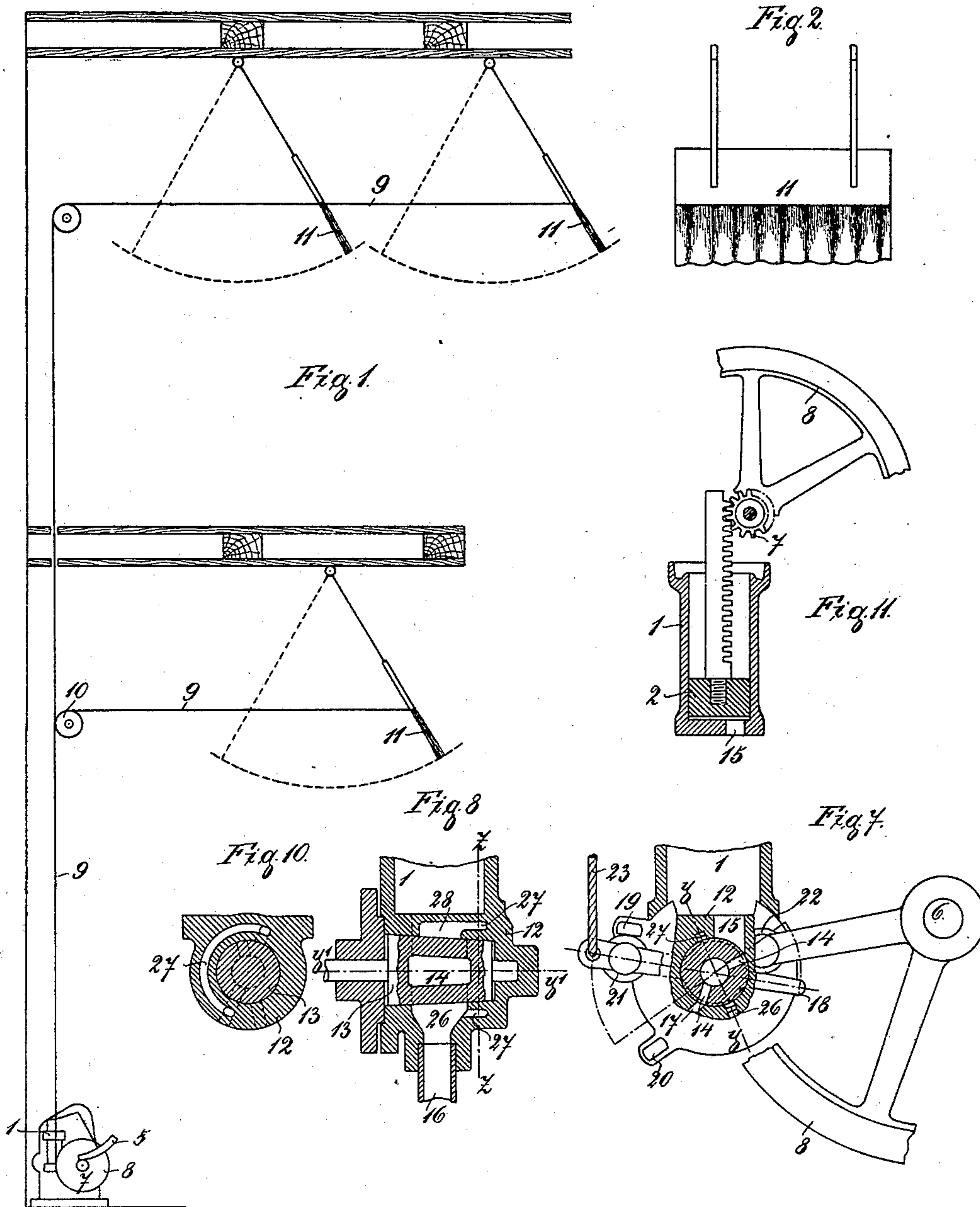
Patented Apr. 9, 1901.

H. SPÜHL.
HYDRAULIC PUNKA MOTOR.

(Application filed Mar. 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
Carl Rupp
Arthur Scholz

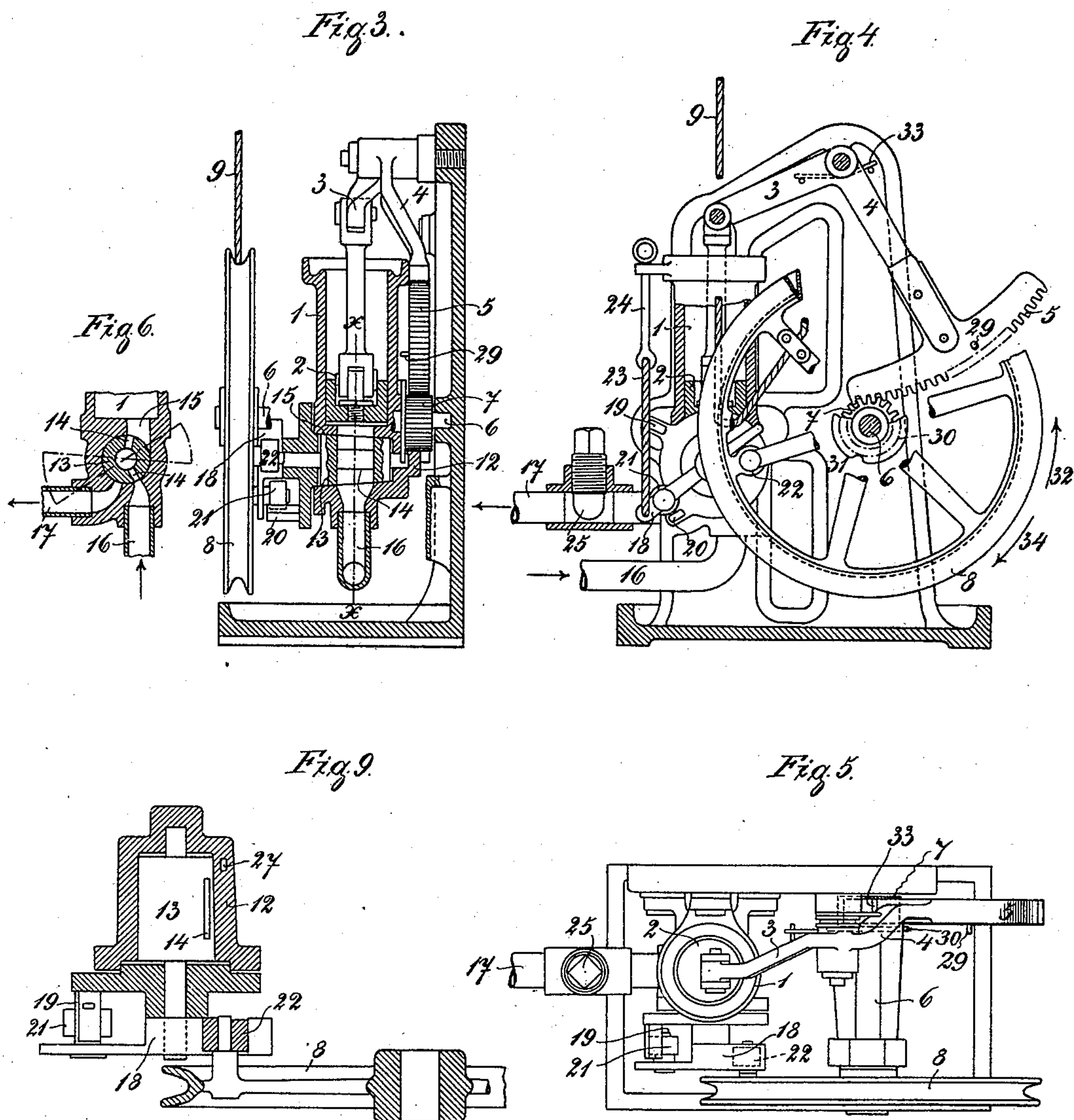
Inventor
Heinrich Spühl
by *Barthelme*
Attorney.

H. SPÜHL.
HYDRAULIC PUNKA MOTOR.

(No Model.)

(Application filed Mar. 8, 1900.)

2 Sheets—Sheet 2.



Witnesses:
Carl Rupp
Arthur Scholz

Inventor:
Heinrich Spühl
by *Wendler*
Attorney.

UNITED STATES PATENT OFFICE.

HEINRICH SPÜHL, OF ST. GALL, SWITZERLAND.

HYDRAULIC PUNKA-MOTOR.

SPECIFICATION forming part of Letters Patent No. 671,455, dated April 9, 1901.

Application filed March 8, 1900. Serial No. 7,912. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH SPÜHL, a citizen of the Confederation of Switzerland, residing at St. Gall, in the Confederation of Switzerland, have invented a new and useful Hydraulic Punka-Motor, of which the following is a specification.

Punkas generally are employed in hot countries for cooling the atmosphere in dining-rooms, sleeping-rooms, ship-cabins, or the like; but they also can be used in cold countries for great halls, such as theaters, concert-halls, or the like.

The present invention relates to a hydraulic motor by means of which impulsion can be imparted to one or several punkas.

A chief feature of my invention is that the motor works quickly and quietly. A small quantity of water is necessary for driving my motor, and the water can be pumped back into the receptacle from which it is drawn off, so that its driving is not expensive.

My motor does not need much space and no attending.

My invention will be better understood with reference to the accompanying drawings, in which—

Figure 1 illustrates a diagrammatic view of my hydraulic punka-motor moving two series of punkas. Fig. 2 illustrates a vertical elevation of a punka. Fig. 3 shows a vertical section through the motor. Fig. 4 is an elevation view of the same, part being in section. Fig. 5 is a top view of the motor. Figs. 6 and 7 are sections through line *xx* of Fig. 3, the cock being in different positions. Fig. 8 is a section through *yy* of Fig. 7. Fig. 9 is a section through *y'y'* of Fig. 8. Fig. 10 is a section through *zz* of Fig. 8. Fig. 11 partly illustrates a vertical section of a modified construction of the motor.

My hydraulic punka-motor consists of an open cylinder 1, within which is movably arranged the piston 2, the rod of which is linked to the arm 3 of a crank-lever 3 4, fixed to the motor-casing. The arm 4 is provided with a toothed segment 5, engaging with the toothed pinion 7, arranged upon the shaft 6. Upon this shaft also is fixed a rope-disk 8, carrying the rope 9, which is fixed to a spoke of the disk 8. The rope 9, in the example illustrated having two branches, is conducted over

guide-rollers 10, and its branches are connected to the punkas 11. Below the cylinder 1 a distributing-cock 13 is arranged within a casing 12 in such a manner that its channel 14 either, Figs. 3 and 6, is in connection with the water-admission pipe 16 and with a bottom opening 15 of the cylinder, Fig. 6, or in the second position, Fig. 7, is in connection with the exhaust-pipe 17 and with the bottom opening 15 of the cylinder. The cock is provided with a prolongation, to which is fixed a double lever 18, the movement of which is determined by stops 19 and 20. A buffer-roller 21, of soft material—as, for instance, caoutchouc or the like—is fixed to said lever to soften the noise. A spoke of the rope-disk 8 also is provided with a roller 22, of soft material. This roller has the purpose to act upon the double lever 18 and to effect automatically the cock reversal. The latter also might be effected by means of connection-pieces 23 and 24. Within the exhaust-pipe 17 I have arranged a screw 25, by which the diameter of the pipe can be lessened at convenience, so that no cock reversal is possible and no impulsion is imparted to the punkas before they have not swung back completely. A semi-circular channel 27, Figs. 8 to 10, leads from the entrance-opening 26 of the cock-casing 12 to a recess 28, arranged within the cock-casing diametrically as to said opening 26 for the purpose of balancing the cock, owing to the counter-pressure of the water, and to obtain thereby an easy play of the cock. In order to secure an exact cock reversal, the segment 5 is provided with a pin 29 and the toothed pinion 7 with a flange 30, having a depression 31. When the segment 5 engages exactly with the pinion 7, the pin 29 during the oscillation of the segment 5 enters the depression 31, while when the exact engagement does not take place the pin 29 meets the flange, brakes the segment, and thereby shows the inexact engagement or the wrong cock reversal to the attendant.

The *modus operandi* of the motor is as follows: A slight upward traction is imparted to the rope 9 by hand. Hereby the rope-disk 8, Fig. 4, is turned in the sense of the hand of a clock, and the cock 13 is turned in the position illustrated in Figs. 4 and 6 as soon as the roller 22 abuts against the lever 18. The

water enters the cylinder and pushes the piston upward. This ascending motion of the piston, owing to the transmission of the crank-lever 3 4, the segment 5, the toothed pinion 7, and the shaft 6, the rope-disk 8 is turned in the direction indicated by the arrow 32, Fig. 4. Hereby an impulsion is given to the punkas connected with the rope 9, Fig. 1. After completion of the rotation the roller 22 meets again the cock-lever 18, reverses the cock into the position according to Fig. 7, in which cylinder 1 is connected with the exhaust-pipe 17. The weight of the piston 2, increased by a spring 33, arranged upon the axle of the crank-lever 3 4 and the suction effect caused by the exhaust-water, effects the turning back of the rope-disk 8 in the direction of the arrow 34, Fig. 4. The punkas now can freely swing back. When the rope-disk 8 completely is turned backward, the roller 22 meets again the lever 18 and reverses the cock 13 into the position illustrated in Fig. 6, so that a second impulsion is imparted to the punkas.

Fig. 11 shows a part of a modified construction in which the toothed pinion 7 and the rope-disk 8 are actuated directly by a toothed piston-rod, the crank-lever 3 4 and segment 5 in this construction totally being omitted. This modification is more simple, but more space is necessary for the same. Evidently my motor can be driven by compressed air instead of water.

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

1. In a hydraulic punka-motor, the combination with an open cylinder and a piston, of a crank-lever fixed to the motor-casing, one arm 3 of said lever being linked to the piston-rod, a toothed segment 5 provided on the other arm 4 of said crank-lever, a toothed pinion 7 arranged upon a shaft 6 and engaging with said segment, a rope-disk 8 arranged upon the shaft 6 and carrying the rope which is fixed to a spoke of said disk, a cock 13 arranged in a casing below the cylinder and adapted to alternatively establish communication of the cylinder with the water-admission pipe and with the exhaust-pipe, a double lever 18 fixed to the prolongation of said cock, stops determining the movement of said lever, a buffer-roller 21 of soft material fixed to said lever, a roller 22 of soft material provided on a spoke of the rope-disk, said roller acting upon the double lever 18, the whole for the purpose as set forth.

2. In a hydraulic punka-motor, the combination with an open cylinder and a piston, of

a crank-lever fixed to the motor-casing, one arm 3 of said lever being linked to the piston-rod, a toothed segment 5 provided on the other arm 4 of said crank-lever, a toothed pinion 7 arranged upon a shaft 6 and engaging with said segment, a rope-disk 8 arranged upon the shaft 6 and carrying the rope which is fixed to a spoke of said disk, a cock 13 arranged in a casing below the cylinder and adapted to alternatively establish communication of the cylinder with the water-admission pipe and with the exhaust-pipe, a double lever 18 fixed to the prolongation of said cock, stops determining the movement of said lever, a buffer-roller 21 of soft material fixed to said lever, a roller 22 of soft material provided on a spoke of the rope-disk, said roller acting upon the double lever 18, a semicircular channel 27 provided in the cock-casing and leading from the entrance-opening 26 of same, a recess 28 arranged within said casing diametrically to the opening 26, the whole for the purpose as set forth.

3. In a hydraulic punka-motor, the combination with an open cylinder and a piston, of a crank-lever fixed to the motor-casing, one arm 3 of said lever being linked to the piston-rod, a toothed segment 5 provided on the other arm 4 of said crank-lever, a toothed pinion 7 arranged upon a shaft 6 and engaging with said segment, a rope-disk 8 arranged upon the shaft 6 and carrying the rope which is fixed to a spoke of said disk, a cock 13 arranged in a casing below the cylinder and adapted to alternatively establish communication of the cylinder with the water-admission pipe and with the exhaust-pipe, a double lever 18 fixed to the prolongation of said cock, stops determining the movement of said lever, a buffer-roller 21 of soft material fixed to said lever, a roller 22 of soft material provided on a spoke of the rope-disk, said roller acting upon the double lever 18, a semicircular channel 27 provided in the cock-casing and leading from the entrance-opening of same, a recess 28 arranged within said casing diametrically to the opening 26, a pin 29 provided on the segment, a flange 30, having a depression 31 provided on the toothed pinion 7 the pin entering the depression during the oscillation of the segment 5, the whole for the purpose as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HEINRICH SPÜHL.

Witnesses:

JOSEPH SIMON,
HANS KOLLEN.