F. W. DRAPER.

WIND MOTOR.

APPLICATION FILED NOV. 27, 1908.

921,681. Patented May 18, 1909.

Fig. 1.

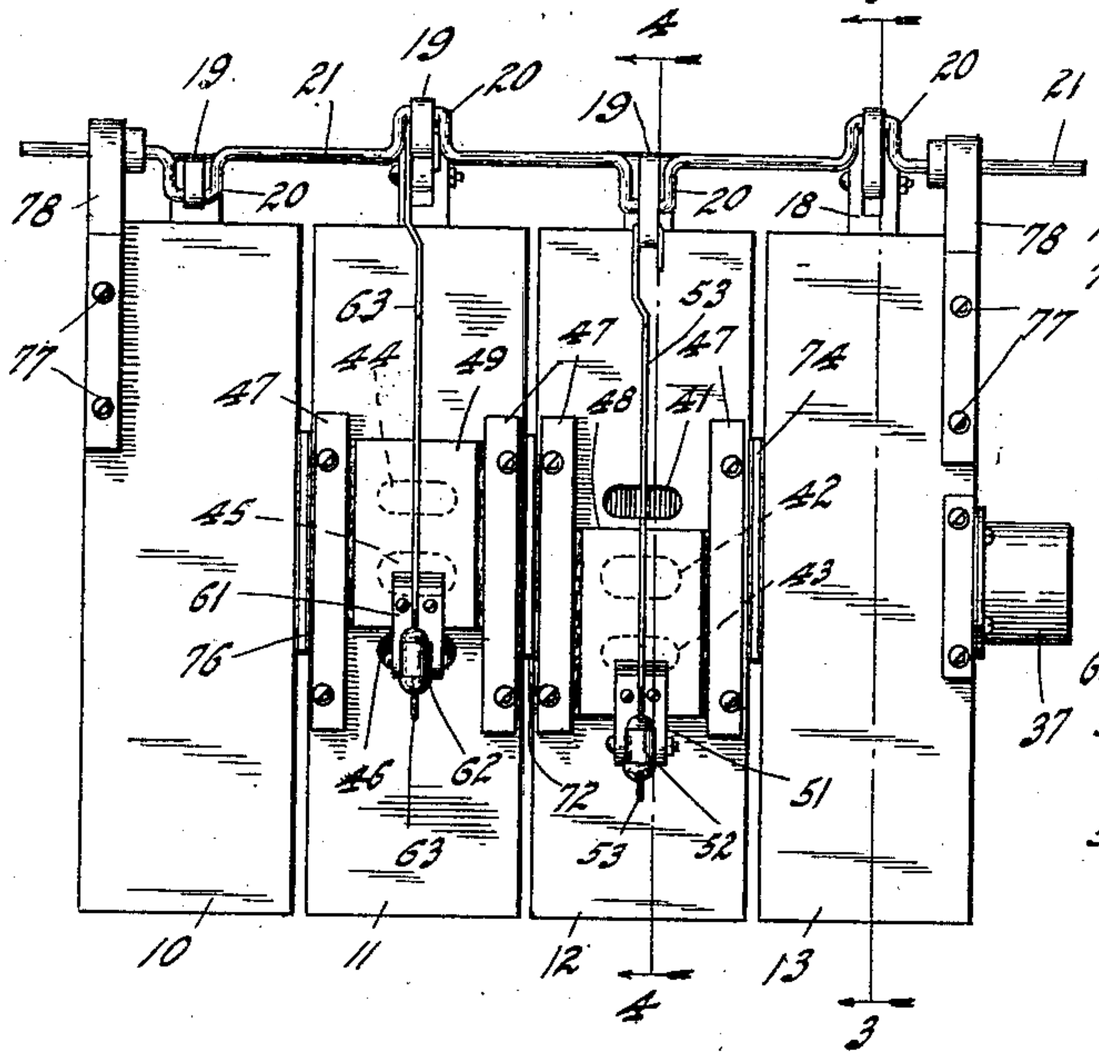


Fig. 3.

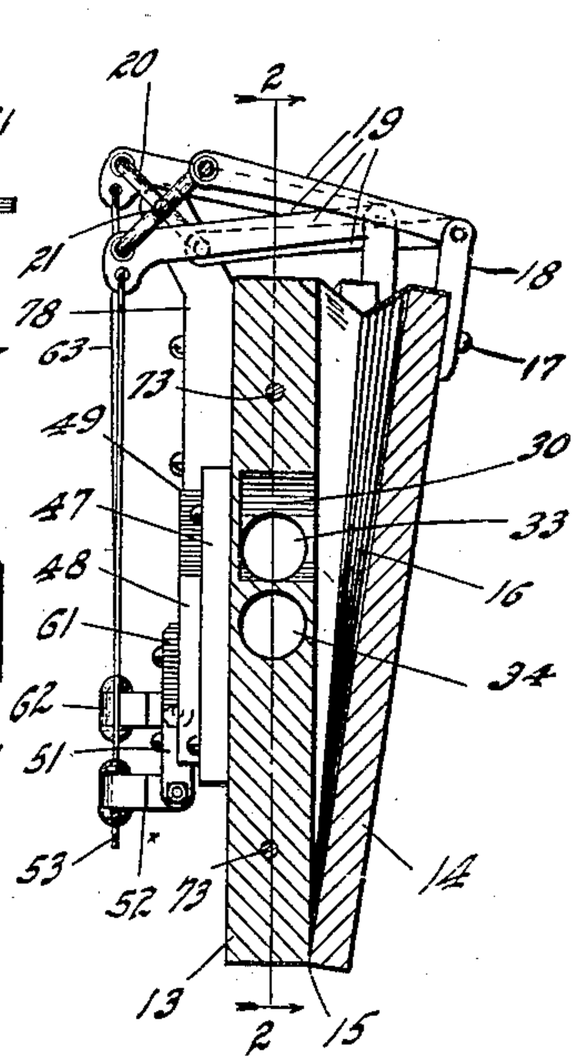


Fig. 2.

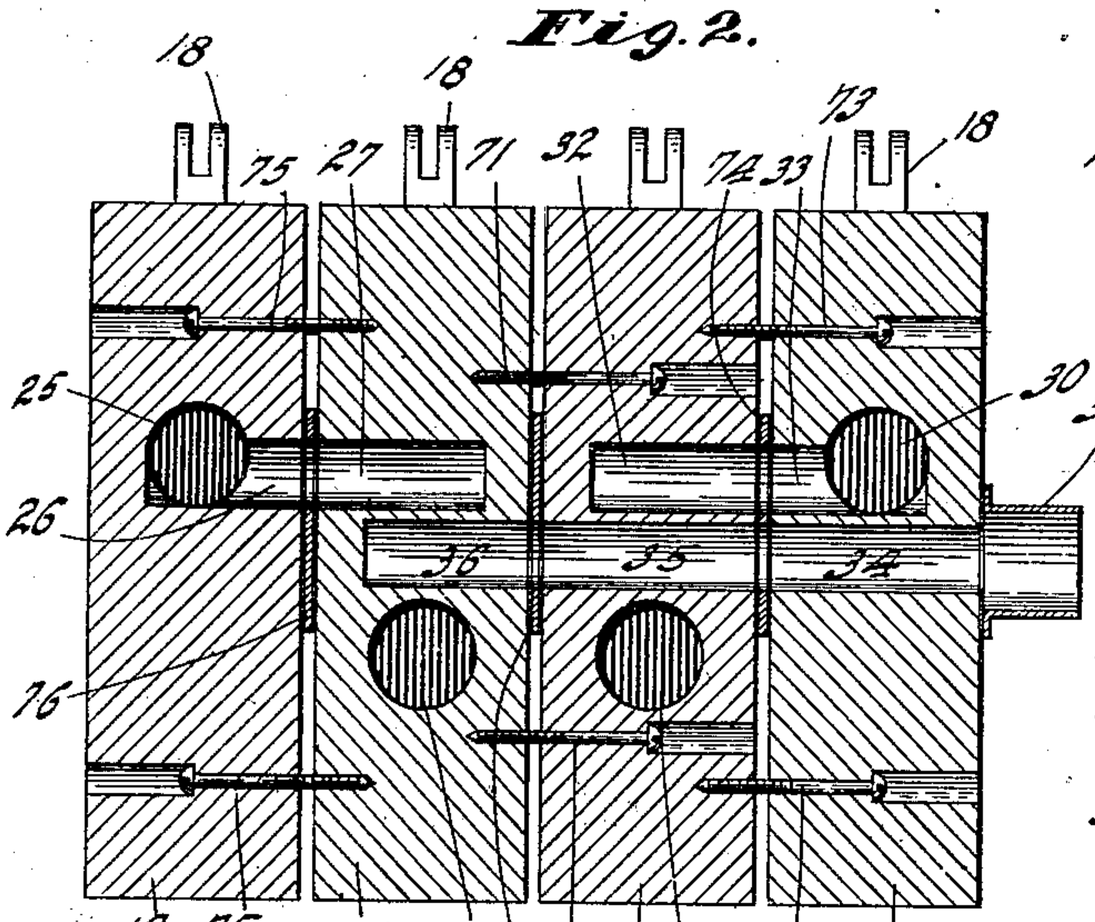
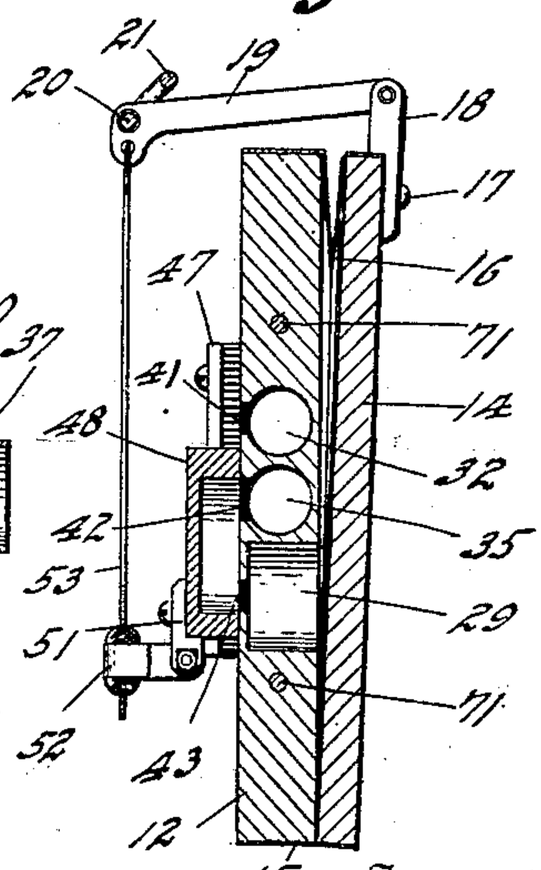


Fig. 4.



Witnesses
Frank A. Fahly
Thomas W. McMeans

Inventor
Francis W. Draper,
By Bradford & Wood
Attorneys

UNITED STATES PATENT OFFICE.

FRANCIS W. DRAPER, OF RICHMOND, INDIANA, ASSIGNOR TO STARR PIANO COMPANY, OF RICHMOND, INDIANA, A CORPORATION OF INDIANA.

WIND-MOTOR.

No. 921,681. Specification of Letters Patent. Patented May 18, 1909.

Application filed November 27, 1908. Serial No. 464,603.

To all whom it may concern:

Be it known that I, FRANCIS W. DRAPER, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Wind-Motors, of which the following is a specification.

The object of my invention is to produce a multiple power member, or multiple-unit wind motor, especially adapted for use in piano playing mechanisms, in which a motor of any desired capacity may be built up from a plurality of motor units which, in their major details, are, for convenience in manufacture, identical, the several units being secured together by ordinary screws into a unitary and complete structure without the necessity of any backing or connecting member.

The accompanying drawings illustrate my invention as embodied in a four-unit motor.

Figure 1 is a valve-side elevation; Fig. 2 a section on line 2—2 of Fig. 3; Fig. 3 a section on line 3—3 of Fig. 1, and Fig. 4 a section on line 4—4 of Fig. 1.

In the drawings, 10, 11, 12 and 13 indicate the main body blocks of four power pneumatics. These body blocks may be of wood or other suitable material and to one face of each is hinged a plate 14 by means of an air tight flexible hinge member 15. The sides and free end of plate 14 are connected to the main body of the pneumatic by means of a bellows connection 16 of ordinary construction. Secured to the free end of each plate 14, by any suitable means such for instance as a screw 17, is an arm 18 to which is pivoted a pitman rod 19 journaled at its free end upon one of a series of cranks 20 carried by or formed integral with the crank shaft 21. To this extent the several units are identical thus facilitating their rapid and cheap manufacture.

In order to produce a four unit motor the several units are differentiated in the following manner. Formed in the inner face of block 10 is a pocket 25 which extends into but not through the block and communicates with a transverse passage 26 which leads to one side edge of the block so as to register with a similar passage 27 extending transversely into the block 11 from one side edge. Similarly block 11 is provided with a pocket 28 which is like pocket 25, extending into the block 11 from the inner face thereof. Block 12 is provided with a pocket 29 and block 13 is provided with a pocket 30, said pockets 29 and 30 being like pockets 25 and 28. Extending into block 12 from one side edge is a passage 32 which registers with a passage 33 extending into one side edge of block 13 and communicating with pocket 30. The passage 34 is formed entirely through block 13 from one side edge to the opposite side edge and registers with a passage 35 which extends entirely through block 12 from one side edge to the other side edge and registers with a passage 36 which extends into but not through block 11 although, in practice, the passage 36 might be continued through block 11 without harm as will be apparent. Secured to block 13 around the outer end of passage 34 is a nipple 37 adapted to receive the usual suction pipe ordinarily found in piano playing mechanisms.

Formed in the outer face of block 12 are three passages 41, 42 and 43 which lead respectively into passages 32, 35 and pocket 29. Similarly I form, in the outer face of block 11, three passages 44, 45 and 46 which lead, respectively, to passages 27 and 36 and pocket 28. Secured to the outer face of the blocks 11 and 12 are guides 47 between which are mounted ordinary D-valves 48 and 49, the valve 48 coöperating with the passages 41, 42 and 43 and the valve 49 coöperating with the passages 44, 45 and 46. Secured to valve 48 is an arm 51 to which is pivoted an arm 52 which, in turn, is connected to one end of a rod 53, the opposite end of said rod being pivoted to that pitman 19 which is connected to the plate 14 of block 12. Similarly, valve 49 is provided with an arm 61 to which is pivoted an arm 62 secured to one end of a rod 63 the opposite end being connected to that pitman 19 which is connected to the plate 14 of block 11. The valves and their connections are identical, thus cheapening manufacture. The two cranks, to which are connected the pitman 19 carrying rods 53 and 63, are set quartering so that, after passage 41 is uncovered by valve 48, passage 46 will be uncovered by valve 49 by the time valve 48 begins to close passage 41, and valve 48 will uncover passage 43 and be ready to start on its return at about the time when passage 44 is uncovered by valve 49.

In order to connect the several units into

a completed structure in the simplest possible manner and at the same time give perfect freedom of movement of the plates 14, I secure blocks 11 and 12 together by means of clamping screws 71 which pass edgewise through block 12 into block 11, a suitable spacing plate 72 being interposed (as clearly shown is Fig. 2) and faced, if desired, by leather or other suitable packing material. Block 13 is then secured to block 12 by means of clamping screws 73 with an interposed spacing plate 74, and block 10 is secured to block 11 by means of clamping screws 75, the spacing plate 76 being interposed. Secured to the outer corners of blocks 10 and 13, preferably by means of screws 77, are arms 78 in the outer ends of which the crank shaft 21 is journaled.

I claim as my invention:—

1. A motor comprising a plurality of separable power pneumatics arranged edge to edge and secured together, one to another, with inlet and exhaust passages to said pneumatics extending transversely thereinto from the edges, a crank shaft, a pitman connecting each of the pneumatics to the crank of said shaft, and valve mechanism connected to said crank shaft and controlling the inlet and outlet passages.

2. A wind motor comprising a plurality of separable power pneumatics having similarly shaped bodies, spacing blocks arranged between each pair of main bodies, clamping screws passing edgewise through one main body into an adjacent main body to clamp said main bodies together upon the interposed spacing block, a crank shaft journaled on said main bodies, connections between said crank shaft and the movable member of each pneumatic, and valve mechanism connected to said crank shaft for controlling the inlet and exhaust passages of the pneumatics.

3. A wind motor comprising the power pneumatic 10 having passages 26 and 25, the pneumatic 11 having passages 27, 28, 36, 44, 45 and 46, the pneumatic 12 having passages 29, 32, 35, 41, 42 and 43, the pneumatic 13 having passages 30, 33 and 34, the said four pneumatics being separable and independent, the spacing plates interposed between each pair of pneumatics, the clamping screws passing edgewise through one pneumatic into the adjacent pneumatic to clamp the same together, a crank shaft journaled in suitable bearings carried by the pneumatics, a pitman connecting the movable member of each pneumatic with the crank shaft, the D valves 48 and 49, and connections between said D valves and the crank shaft, all substantially as and for the purpose set forth.

In witness whereof, I, have hereunto set my hand and seal at Richmond, Indiana, this 21st day of November, A. D. one thousand nine hundred and eight.

FRANCIS W. DRAPER. [L. S.]

Witnesses:

PHILIP JOHNSON,

H. C. NILES.