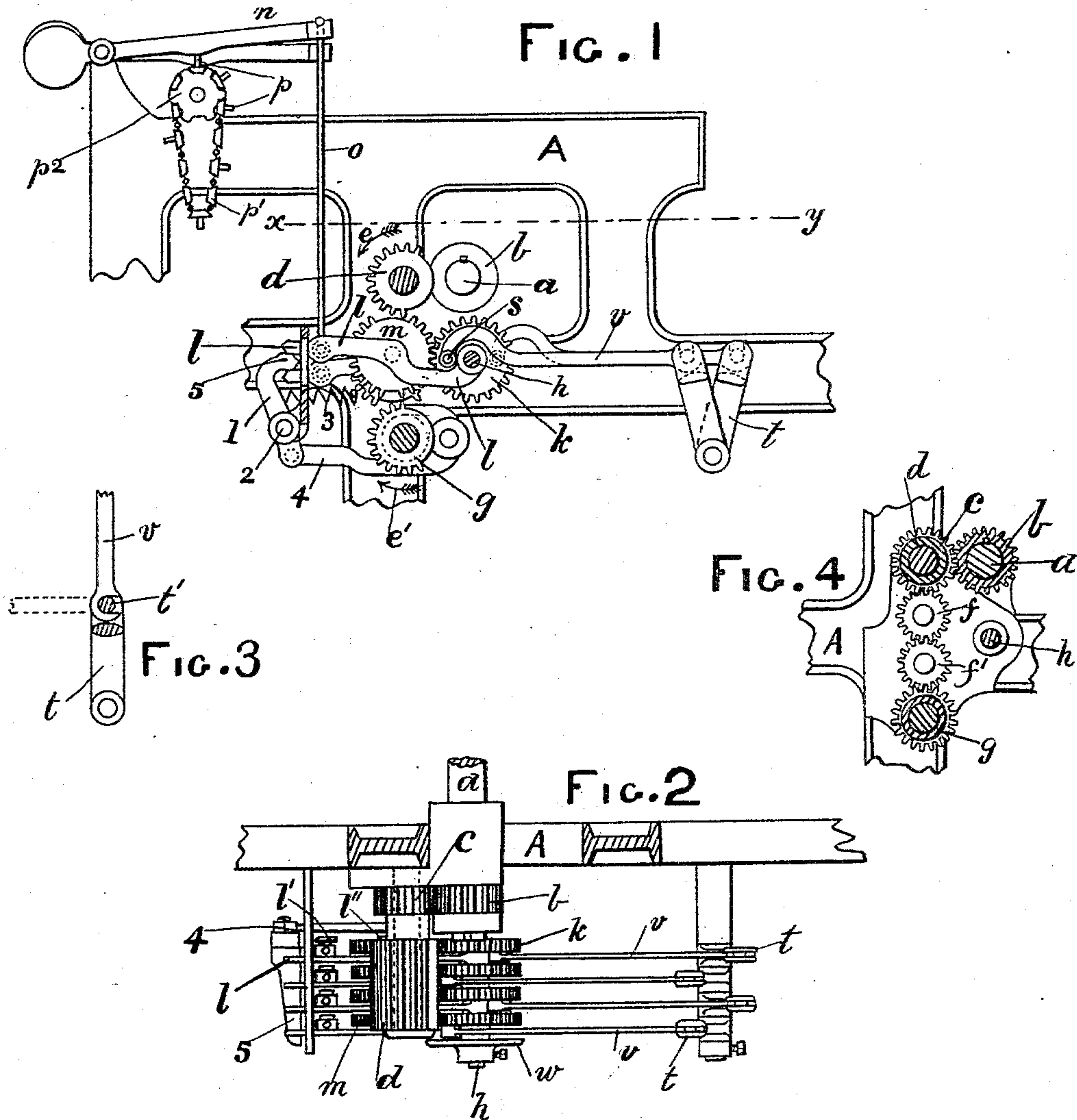


(No Model.)

R. L. HATTERSLEY & J. HILL.
MECHANICAL MOVEMENT.

No. 414,641.

Patented Nov. 5, 1889.



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MECHANICAL MOVEMENT.

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To all whom it may concern:

Be it known that we, RICHARD LONGDEN HATTERSLEY and JAMES HILL, subjects of the Queen of Great Britain, residing at Keighley, in the county of York, England, have invented an Improvement in Mechanical Movements, of which the following description, in connection with the accompanying drawings, is a specification.

This invention has for its object the construction and arrangement of a system of gearing consisting of upper and lower partly-toothed cylinders, into connection with one or the other of which at predetermined times may be made to gear any one or more or the whole of a series of intermediate gear-wheels, which operate, in connection with a corresponding series of toothed crank-wheels, for the purpose of moving, when put into operation, one or more or all of a series of levers, this arrangement operating to lock or rigidly hold the levers at each extremity of their respective movements in such a manner that any force acting upon the said toothed crank-wheels through or by the levers they operate, as by said levers having to overcome some weight or power before they are and when being and after they have been moved, is withstood by a stationary shaft upon which the said wheels are mounted, while at the same time the movements of their series of intermediate gear-wheels are freely permitted for the purpose of allowing the same to be placed into or out of gear with one or the other of the partly-toothed cylinders, which, when rotated, operate the toothed crank-wheels by means of their intermediate wheels, and so effect such interchange in the positions of the levers as may be predetermined by the arrangement of the pins or pegs in peg-lag or pattern surfaces, which are employed for raising or allowing to fall the intermediate wheels, as above described, into gear with the upper or lower partly-toothed cylinder.

The object of this invention further extends to the construction and arrangement of the series of toothed crank-wheels, their respective intermediate wheels, lever-arms, and connecting-rods in such a manner that while the same are in their respective operating

positions no one part thereof can become detached from another; yet by releasing one binding-plate any single part may be detached or the whole may be taken away together. We attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a part-sectional side elevation of the parts forming our improved mechanical movement. Fig. 2 is a top view of the parts shown by a section of Fig. 1 on line $x y$, together with certain of the parts that are not shown in Fig. 1, on account of the said Fig. 1, being in section. Fig. 3 is a sectional detail showing the construction and arrangement of the jointings of the connecting-rods to their respective levers. Fig. 4 is a sectional detail showing the gear for imparting motion to the partly-toothed cylinders.

Similar letters refer to similar parts throughout the several views.

The parts marked A form the frame-work for the bearing of the motor parts.

Upon the driving-shaft a , which may be rotated by any common and well-known motor, is mounted the gear b , which imparts motion through the gear c to the partly-toothed cylinder d , and this in the direction indicated by the arrow e . From the cylinder d motion is imparted by means of the gears $f f'$ to the other partly-toothed cylinder g , and this in the direction indicated by the arrow e' .

Mounted loosely, so as to revolve upon the stationary or fixed shaft h , which is carried by the frame-work A, is the series of toothed crank-wheels k , and also loosely mounted upon this shaft h is the series of levers l , attached to or formed on each of which, in a suitable position, is a pin or stud, (shown in broken lines, Fig. 1,) upon which is loosely mounted an intermediate wheel m , arranged to be (when in operating condition) continuously in gear with its corresponding wheel in the series of wheels k . The outer ends of the levers l are made to extend, as shown, and are respectively coupled to the levers n by their respective rods o . The levers n are operated or raised by the pegs or pins p , (which form the pattern-surface on the peg-lags p' , and the positions of which may be altered, as is usual,

the same being common and well-known.) Consequently so also are the levers l and their respective wheels m , while the reverse movement of these parts is effected by gravity.

5 Thus when a pin p is brought in a common and well-known manner by its cylinder p^2 , so as to raise one or other of the levers n , one or other of the wheels m will be lifted into gear with the toothed cylinder d , and when

10 the said pin p is moved from this position then the wheel m , that it had raised, will descend and fall into gear with the toothed cylinder g . This cylinder d has (as also has the cylinder g) a sufficient number of teeth to impart

15 a semi-rotation to all or any of the wheels in the series m , and, the pitch of the teeth in each of the wheels in the series m agreeing or corresponding with that of the wheels in the series k , when one or the other of the

20 wheels m is placed in gear, as above described, with the cylinder d , and thus rotated, its corresponding wheel k will be semi-rotated—say from the position shown in Fig. 1—by which means the crank-pin s will be

25 brought into a position diametrically opposed to its former position, while when the said wheel m , which was placed into gear with the cylinder d to effect the interchange of position, is placed into gear with the cylinder

30 g , and is thereby operated, the crank-pin s is caused to assume its former position. Now, as both the positions assumed by the pin s are so arranged relatively to the positions of the outer ends of the levers t that any force

35 exerted through that lever in this said series t , to which it is coupled by one or the other of the connecting-rods v , will act in a straight line through the center of the wheel k , said force will be withstood by the shaft h . The

40 lever 1, hinged at 2 and moved in one direction through the medium of the rod 4 by a cam mounted upon or attached to rotate with the toothed cylinder g and in the other direction by the spring 3, is employed for rigidly hold-

45 ing the levers l in their raised or lowered position by means of its broad outer end 5 being brought between the ends of levers l , so that the series of wheels m are firmly held while being rotated, as above described.

By arranging the series of wheels k upon 50 the stationary shaft h as above described we are enabled to utilize each of the wheels k to keep its adjoining connecting-rods v in position relatively to the other of said wheels k , with the exception of the one on the outside, 55 and this is kept in position by the plate w , Fig. 2, which is rigidly mounted upon the same shaft h . In a similar manner, also, are the wheels m and rods o kept in contact with their respective levers l . However, in this case an 60 ordinary button-head is employed, the same being formed on the pins, as at $l' l''$, on the outermost lever l for keeping the outermost wheel and rod in position. As will be seen, it is only necessary to release the outer plate 65 w , and then the whole of the other parts are free to be detached, so far as connection with shaft h is concerned. Again, the jointings of the rods v to their respective levers t are so formed, as shown by Fig. 3, that by moving 70 the said rods v from their operating position, which is somewhat horizontal and at right angles relatively to the levers t , to the somewhat perpendicular position shown by Fig. 3, or about into a straight line with the said levers 75 t , the said rods v are freed from connection with the pins t' , and so may be detached for repairing or other purposes.

We claim—

In a mechanical movement, the combination 80 of the partly-toothed cylinders d and g , means for imparting motion to these cylinders d and g , the toothed gearing-wheels m , mounted as described, the levers l , pattern devices for operating these levers l , the crank-wheels k , 85 mounted to rotate upon a stationary shaft h , the shaft h , the rods v , having their jointings in connection with the pins t' , formed as shown, the levers t , and the plate w , all these said parts being constructed and arranged to 90 operate substantially as specified.

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