No. 803,149. PATENTED OCT. 31, 1905.

E. S. CLARK.

PARALLEL ADJUSTABLE STROKE MECHANISM.

APPLICATION FILED FEB. 3, 1905.

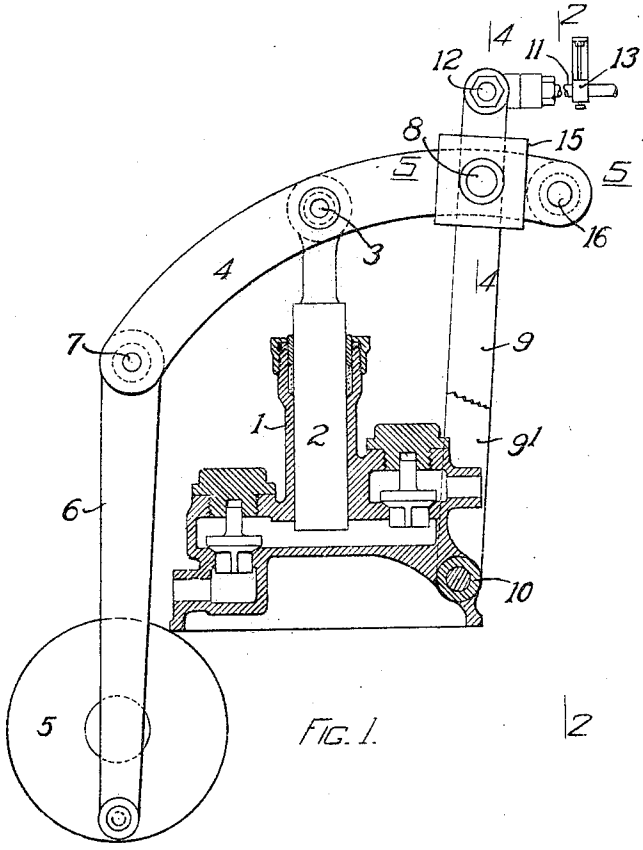


FIG. 1.

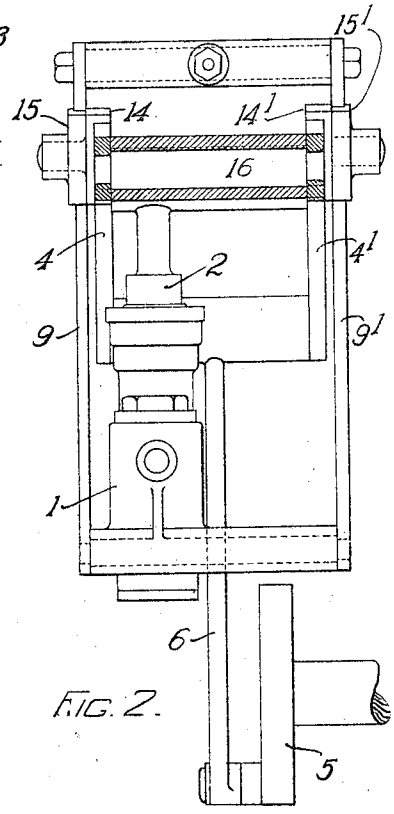


FIG. 2.

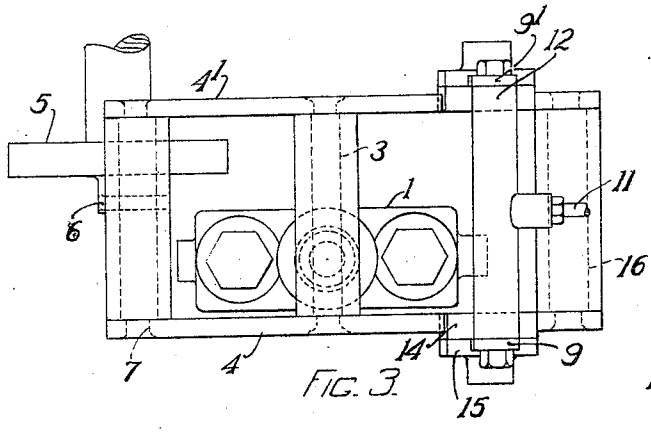


FIG. 3.

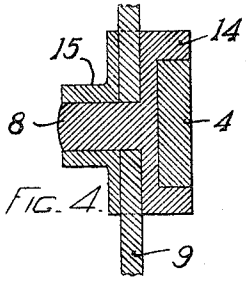


FIG. 4.

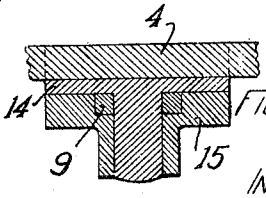


FIG. 5.

WITNESSES

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PARALLEL ADJUSTABLE-STROKE MECHANISM.

No. 803,149. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed February 3, 1905. Serial No. 243,976.

To all whom it may concern:

Be it known that I, EDWARD S. CLARK, of the city of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Parallel Adjustable-Stroke Mechanism; and I do hereby declare that the following is a clear, full, and exact description of the same.

This invention consists of a parallel adjustable-stroke mechanism, and has for its object the construction of such a mechanism as will enable the stroke of a plunger-pump or other suitable device to be varied at will without stopping the reciprocating motion actuating this mechanism to fix the amount of said stroke while at any predetermined point the inward or lower position of this stroke remains constant. A device illustrating one method of accomplishing this object is shown in the accompanying figures, in which like characters designate like parts in all the views.

Figure 1 is a vertical side elevation of such a mechanism applied to a pressure-pump, which is shown in section. Fig. 2 is an end elevation of the same device with a part in vertical section, on line 2 2, Fig. 1. Fig. 3 is a plan view of the device shown in Fig. 1. Fig. 4 is a vertical section on line 4 4 of Fig. 1. Fig. 5 is a horizontal section on line 5 5 of Fig. 1.

1 is any suitable apparatus, such as a pressure-pump, for automobiles or other locomotive-carriers.

2 is a pump-plunger operatively entered into a pump-barrel of Fig. 1. The upper end of this pump-plunger 2 is pivoted at a point marked 3 to a sector 4. This sector 4 is given reciprocating motion by means of the crank 5, actuating the connecting-rod 6, operatively connected to the sector 4 at a point marked 7. This sector 4 is carried by a pivot 8, entered into a box 15, fixedly attached to the hinged arm 9. The lower end of this arm 9 is pivoted or hinged at a point marked 10 to any suitable base, such as the pump-case before mentioned. At the upper end of the arm 9 is pivotedly attached by pin 12 a rod 11, fixedly held at any desired part of its length by the clamp 13, attached to any suitable part of the framework carrying this apparatus. The pivot-block 14, carrying the pivot 8, is a sliding fit upon the sector 4. Part 16 is a stud uniting the two sectors 4 and 4′ when a double form of construction is used.

In the views I have shown this mechanism constructed with two similar sectors 4 4′, two similarly-hinged arms 9 9′, with connecting thimbles and pins, and sliding pivot-blocks 14 14′ and boxes 15 15′, as a more substantial form of construction; but it is obvious that the same mechanism would operate in a similar manner if constructed of single elements only.

The operation of this mechanism is as follows: The hinged arm 9 being fixedly held in the position shown in Fig. 1 by means of the clamp 13, holding the rod 11, the pivot-block 14 is locked with its pivot 8 at a predetermined distance from the pivot 3 in the upper end of the plunger 2. Motion being now imparted to the crank 5 by any suitable means, the free end of the sector 4 is caused to reciprocate a distance equal a double throw of the crank 5. This imparts a reciprocating motion to the plunger 2 in direct proportion to the distance between the pivots 8 3 and 8 7, respectively, when the axis of the pivot 8 is moved so as to coincide with the pivot 3, (by rotating the arm 9 about its pivot 10 by means of the rod 11 being freed from the clamp 13 and then fixed in its new position,) and reciprocating motion is then given to the free end of the sector 4. No motion will be imparted to the plunger 2, and it will remain in its lower or inner position. At each stroke of the plunger 2 the sector 4 will have a slight reciprocating motion in the block 14.

It is obvious that any variable amount of motion may be given to the plunger 2 by fixing the pivot 8 at different distances from the pivot 3, in all of which cases the termination of the inner stroke of the plunger 2 will be at the same point; but the termination of the outer position of the plunger 2 will be at a variable point. One advantage of this feature as applied to water and liquid-fuel pumps of automobiles or locomotive-carriers is that the clearance in such pumps is reduced to a minimum.

Having now fully described the construction and operation of this mechanism, what I desire to secure by Letters Patent is as follows:

1. A parallel adjustable-stroke mechan-

ism consisting of a sector carried by a sliding pivot, a hinged arm carrying said pivot of the same radius as said sector; means for adjusting the position of said hinged arm, so as to locate said sliding pivot at any point on said sector, and means for reciprocating said sector about said pivot.

2. A parallel adjustable-stroke mechanism consisting of a sector carried by a sliding pivot, a hinged arm carrying said pivot of the same radius as said sector; means for adjusting the position of said hinged arm, so as to locate said sliding pivot at any point on said sector, means for reciprocating said sector about said pivot, and means for operatively connecting a part to be reciprocated in a direct line, to said sector.

3. In a variable-stroke pump the combination of a pump-chamber, a plunger entered therein operatively connected to a reciprocating sector carried by a sliding pivot, a hinged arm carrying said pivot; means for adjusting the position of said hinged arm, so as to vary the reciprocation of said sector and means for reciprocating said sector about said pivot.

4. In a variable-stroke pump a combination of a pump-chamber, a plunger entered therein operatively connected to a reciprocating sector; said sector operatively connected to a hinged pivot, a hinged arm carrying said pivot, the hinge of said arm located beyond the inner end of said plunger in its inmost position.

5. In a variable-stroke pump a combination of a pump-chamber, a plunger entered therein operatively connected to a reciprocating sector; said sector operatively connected to a hinged pivot, a hinged arm carrying said pivot, the fulcrum of said arm located to bring the sliding pivot coincident with the connecting-points of said plunger and reciprocating means on said sector at their inmost positions.

6. In a variable-stroke pump, the combination of a pump-chamber, a plunger entered therein, operatively connected to a reciprocating sector carried by a sliding pivot, a hinged arm carrying said pivot; means for adjusting the position of said hinged arm so as to vary the reciprocation of said sector, means for reciprocating said sector about said pivot, the hinge of said pivoted arm located beyond the inner end of said plunger in its inmost position to effectuate the termination of the inward stroke of said plunger at a point of minimum clearance.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

EDWARD S. CLARK.

Witnesses:

EDWIN D. SIBLEY,

ISAAC H. DAVIS.