

J. L. & J. E. LEE.  
MECHANICAL MOVEMENT.

(Application filed Sept. 19, 1898.)

(No Model.)

2 Sheets—Sheet 1.

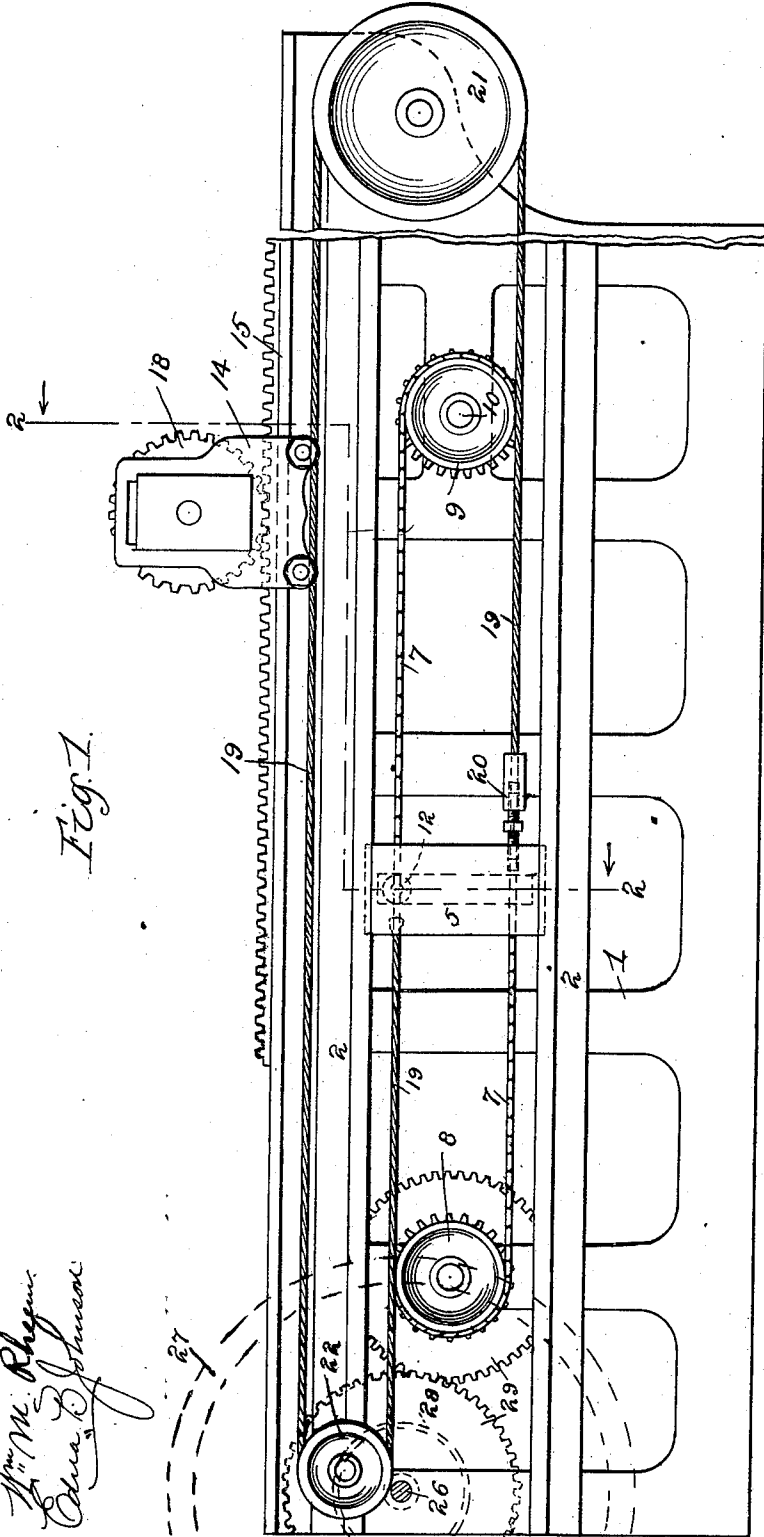


Fig. 1.

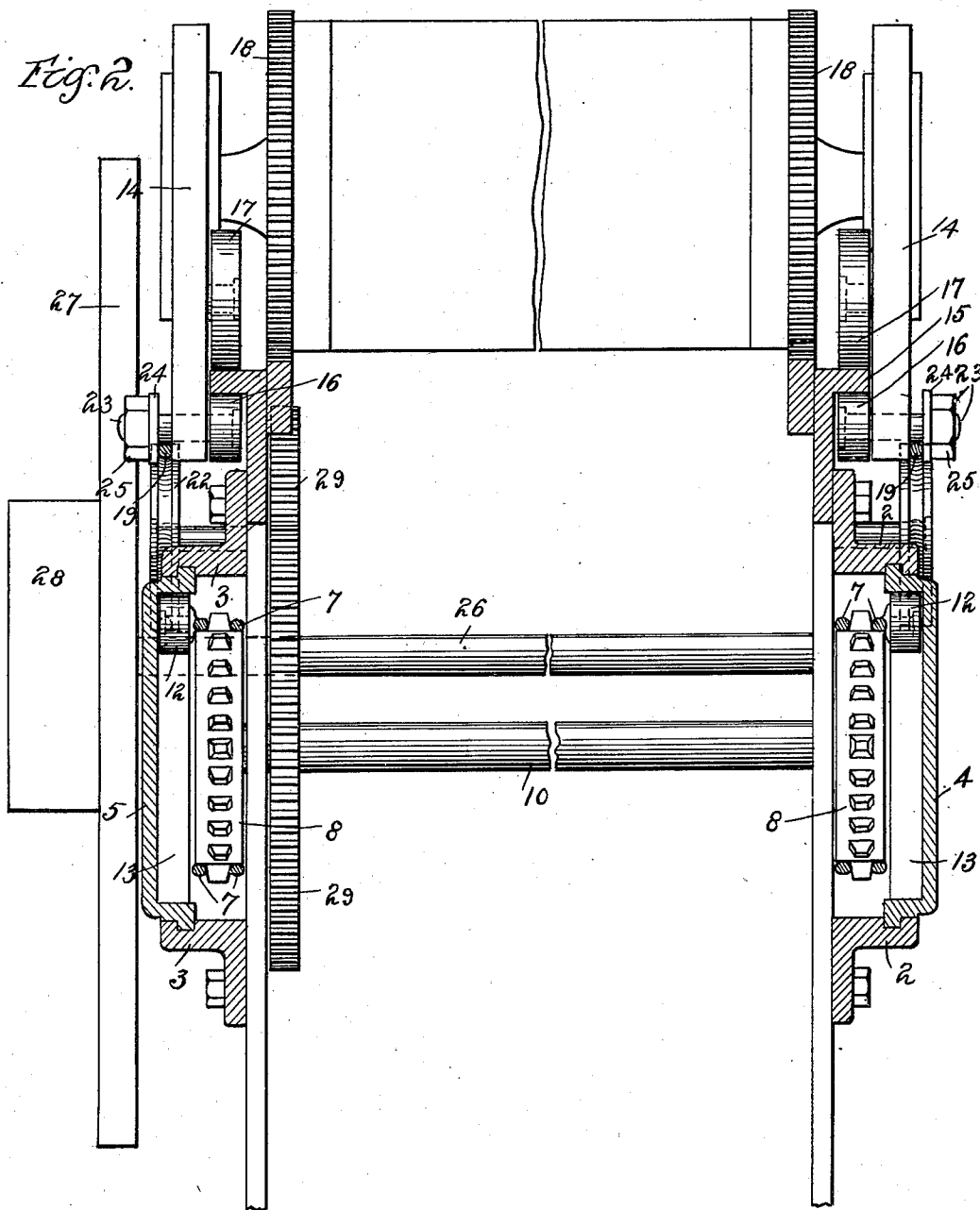
Witnesses  
Wm. M. Rhymer  
Oliver Johnson

Inventors  
Jas. L. Lee  
Jas. E. Lee  
by Robert H. Hopson  
Attys.

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2 Sheets—Sheet 2.



*Witnesses.*  
*Wm. M. Rhee.*  
*Ema. Johnson.*

*Inventors*  
*Jas. L. Lee*  
*Jas. E. Lee*  
*by Elliott & Hopson*  
*attys*

# UNITED STATES PATENT OFFICE.

JAMES L. LEE AND JAMES E. LEE, OF CHICAGO, ILLINOIS.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 671,729, dated April 9, 1901.

Application filed September 19, 1898. Serial No. 691,325. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES L. LEE and JAMES E. LEE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a full, clear, and exact specification.

Our invention relates more particularly to mechanical movements for transforming the rotary movement of a shaft into a reciprocatory or to-and-fro movement, and while our invention is useful for the various purposes where such motion is applicable it is more especially designed for reciprocally moving that portion of a cylinder printing-press which carries or is carried over the type or printing surface; and it has for its primary object to provide a simple movement that will carry the cylinder or other part to be reciprocated throughout the long travel required of it without unduly straining the journals or supports of the cylinder or such other part or imparting torsional movement thereto.

A further object of our invention is to provide a mechanical movement for the described purpose which shall be light and strong and will occupy but little space.

With these ends in view our invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of a printing-press bed-frame and impression-cylinder having our mechanical movement applied thereto, and Fig. 2 is an enlarged transverse sectional view thereof.

In applying our mechanical movement to a printing-press for carrying the impression-cylinder back and forth over the type-bed, which is the example shown in the accompanying drawings, each side of the bed-frame 1 is provided with parallel guideways 2 3, arranged one over the other, as more clearly shown in Fig. 2, and mounted between, so as to slide along each pair of these guideways, is a block or cross-head 4 5, the upper and lower ends of the cross-head being provided

with a spline or ridge 6, fitting in complementary grooves formed in the opposed faces of the guideways 2 3. Each of these blocks has sliding connection with an endless belt, preferably consisting of a sprocket-chain 7, running over sprocket-wheels 8 9 at opposite ends, the sprocket-wheels 8 9 on one side of the bed-frame being connected to the diametrically opposite sprocket-wheels by shafts 10 11. This sliding connection between the endless belt or chain 7 and the cross-head 4 may be conveniently and effectively accomplished by providing the chain with an anti-friction stud or roller 12, projecting laterally therefrom and engaging in a vertical groove 13, formed in the inner face of the cross-head, thus compelling the cross-head to reciprocate or slide back and forth on the guideways, while the chain or belt 7 continuously travels in one direction. In order that this movement of the cross-head may be imparted to the cylinder-carriage 14 and at a point nearly in line with the flange or track 15, under and over which the carriage-rollers 16 17 travel, so as to avoid the possibility of causing the rollers 16 17 to bind on the track 15 or causing the cylinder 18 to careen, we employ a cable 19 or other flexible connection, whose ends are attached to the cross-head 4 5 on each side of the bed-frame, while the intermediate portion or upper fold of the cable is attached to the lower edge of the carriage 14 on each side immediately below or contiguous to the track 15, so that the line of pull on the cable will be nearly in direct line with the track 15, and the said binding action of the rollers 16 17 will be thereby avoided. In thus arranging the cable one end is attached to the lower end of the cross-head, preferably at the edge, so as to bring the line of strain directly in line with the groove in the guides 2 3 in which the cross-head runs. This attachment may be effected by means of a turnbuckle 20, so as to take up the slack in the cable when desired. The cable is then carried horizontally, at least as far as the extremity of the travel of the cross-head, and passed around an idler 21, whose diameter is such that the upper fold of the cable will be held as high as the point of attachment between the cable and the carriage 14, while the lower end of the cable, where it

is attached to the turnbuckle 20, will be held in line with the stud 12 when the latter is at the lower end of the groove 13, so that the strain on the cross-head produced by the pull of the stud 12 will be directly in line with the point of attachment between the cable and the cross-head at the lower end throughout the length of the lower fold of the belt 7.

Arranged at the opposite end of the bed to that on which the sheaves 21 are mounted is another idler or sheave 22 on each side, over which the upper fold of the cable 19 passes. After passing around and under the sheave 22 the remaining end of the cable is attached in any suitable way to the upper edge of the cross-head on the opposite side to the turnbuckle 20 and preferably at a point directly in line with the stud 12 when the stud is at the upper end of the slot in the cross-head, the diameter of the sheave 22 being such that the cable where it extends between such sheave and the cross-head will be held in this position.

The cable 19 may be attached to the carriage 14 on each side in any suitable manner. We have shown the studs 23, which serve as journals for the rollers 16, provided at their outer ends with washers 24 and nuts 25, which securely clamp the cable 19 to the side of the carriage.

The chain belt 7 receives continuous motion from a driving-shaft 26, having, if desired, a fly-wheel 27 (shown in dotted lines) and a belt-pulley 28, the connection between the shaft 26 and one of the sprocket-wheel shafts (the shaft 11) being effected by a pair of gear-wheels 29. The gear-wheels 29, pulley 28, and fly-wheel 27 may be located on either side of the press; but it will be understood that where this mechanical movement is applied to a printing-press for imparting the desired travel to the impression-cylinder the described arrangement of cable 19, endless belt 7, cross-heads 4 5, and the sheaves 21 22 will be arranged on each side of the bed-frame and one of the cables 19 will be attached to each of the carriages 14, usually located at opposite ends of the impression-cylinder, thus propelling the cylinder with a uniform and equal pressure at opposite ends, so as to avoid the possibility of twisting or torsional movement that might result from applying the power to one end only. Our mechanical movement, however, it will of course be understood, comprises in the generic sense of our invention but a single set of these devices.

When rotation is imparted to the sprocket-shaft 11, causing the belt 7 to travel continuously in one direction, it will be seen that the stud 12 when moving toward the right, for instance, as viewed in Fig. 1, will impart a pull directly in line with the upper end of the cable 19 and cause the carriage 14 to travel to the left as far as the stud 12 moves from the left to the right, and as the cross-head approaches the limit of its movement on

the right and the stud 12 follows around the sprocket 9 it will descend in the slot 13 of the cross-head and come directly in line with the lower end of the cable and pull the latter toward the left, thus returning the carriage 14 to the limit of its movement on the right.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. A mechanical movement having in combination an endless traveling belt, a sliding cross-head having operative connection therewith, a cable having its ends attached to opposite ends of said cross-head out of line with each other and means of attachment between said cable and the part to be moved, substantially as set forth.

2. A mechanical movement having in combination an endless traveling belt, a sliding cross-head having operative connection therewith and a cable having its ends attached to opposite ends of the cross-head and at points in line with the point of operative connection between the belt and cross-head, substantially as set forth.

3. A mechanical movement having in combination an endless belt, a sliding cross-head having a slot extending transversely of said belt, a stud on the belt engaging in said slot and a cable having its ends attached to opposite ends of the cross-head in line with said stud when the latter is in that end of the slot in the cross-head, substantially as set forth.

4. A mechanical movement having in combination a traveling belt, a sliding cross-head having operative connection with said belt, sheaves arranged beyond the extremities of said belt, a cable passing over said sheaves and having its ends brought toward but out of line with each other and attached to opposite ends of said cross-head and means for connecting the part to be moved with said cable at a point between the sheaves, substantially as set forth.

5. A mechanical movement having in combination an endless traveling belt, a cross-head having operative connection therewith, two sheaves, a cable passing over said sheaves and having its ends brought toward but out of line with each other and attached to opposite ends of said cross-head one of said sheaves being of larger diameter than the other whereby the ends of the cable while being out of line will be parallel with the line of movement of the cross-head, substantially as set forth.

6. A mechanical movement having in combination an endless traveling belt, a slotted cross-head, a lug on said belt engaging in the slot of said cross-head, two sheaves, a cable passing over said sheaves and having its ends brought toward but out of line with each other and attached to opposite ends of said cross-head, one of said sheaves being of larger diameter than the other and the ends of said cable being arranged parallel with and substantially in the same horizontal planes as

the folds of said belt respectively, substantially as set forth.

7. A mechanical movement having in combination an endless belt traveling continuously in the same direction, wheels over which said belt travels, a cross-head adapted to pass the axes of said wheels, an operative connection between which said belt and cross-head for causing the latter to reciprocate, a pair  
5 of sheaves, a cable passing over said sheaves  
10

and having its ends brought toward but out of line with each other and attached to opposite ends of said cross-head, substantially as set forth.

JAMES L. LEE.  
JAMES E. LEE.

Witnesses:

FRED SHALES,  
JOHN W. SCHROEDER.