

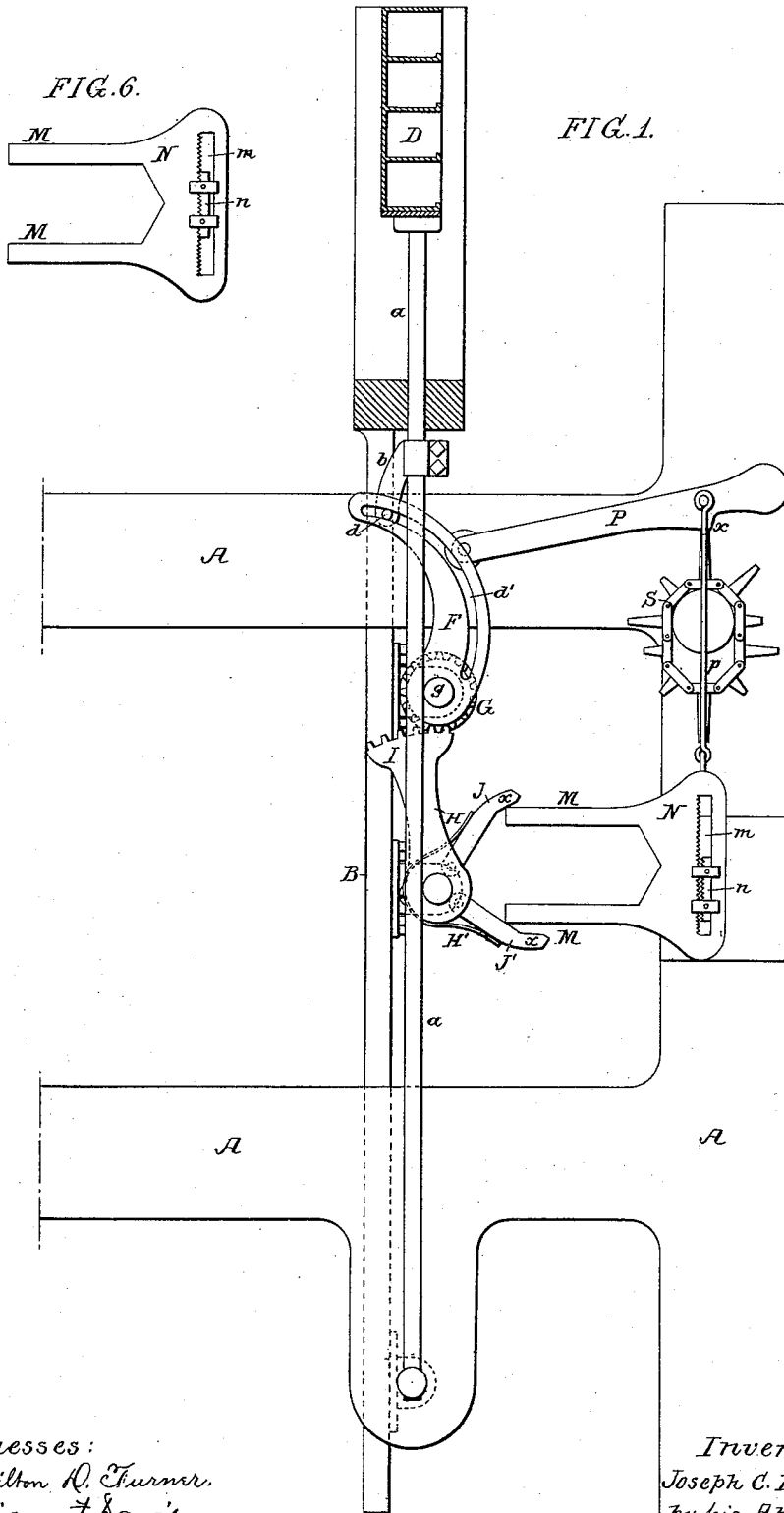
(No Model.)

2 Sheets—Sheet 1.

J. C. POTTS.
DEVICE FOR CONVERTING MOTION.

No. 333,333.

Patented Dec. 29, 1885.



Witnesses:
Hamilton R. Turner.
William F Davis

Inventor
Joseph C. Potts
by his Attorneys
Howson & Sons

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FIG. 2.

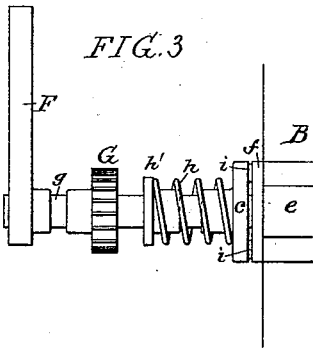
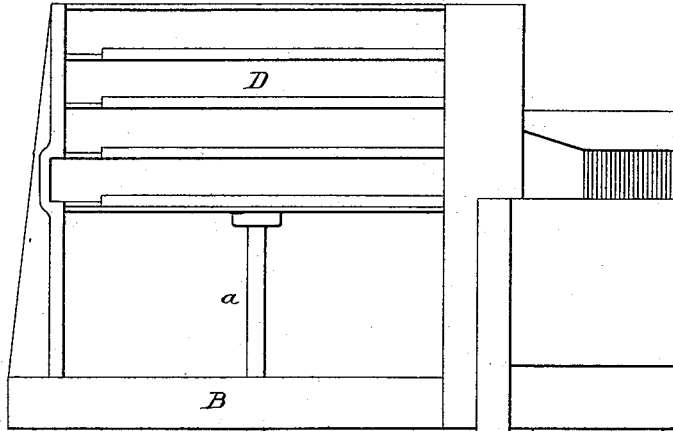


FIG. 4.

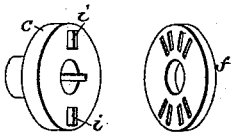
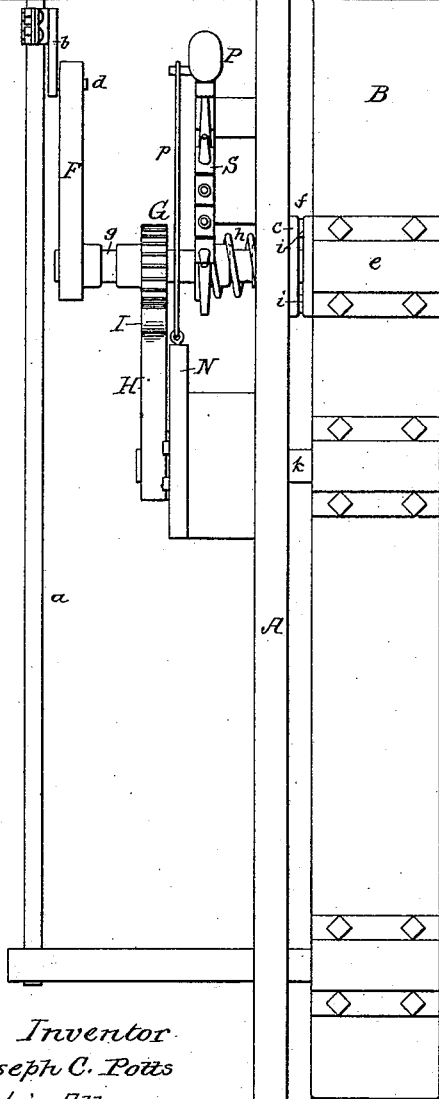
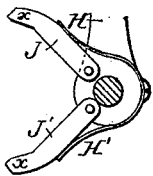


FIG. 5.



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UNITED STATES PATENT OFFICE,

JOSEPH C. POTTS, OF BERWYN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
JOSEPH H. COATES, OF SAME PLACE.

DEVICE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 333,333, dated December 29, 1885.

Application filed November 21, 1885. Serial No. 183,529. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. POTTS, a citizen of the United States, residing at Berwyn, Pennsylvania, have invented certain Improvements in Devices for Converting Motion, of which the following is a specification.

The object of my invention is to construct a device whereby a uniform vibrating or reciprocating movement in one direction may be transformed into a differential reciprocating movement in another direction.

My present invention is similar in principle to that described and claimed in my Patent No. 326,777, September 22, 1885, the present device, however, being simpler in detail than that set forth in the patent.

In the accompanying drawings, Figure 1 is a side view of a device embodying my present invention; Fig. 2, a front view of the same, and Figs. 3, 4, 5, and 6 detached views illustrating details in the construction of the device.

The mechanism forming the subject of my invention may be applied to various uses in which it is desired to transform a vibrating or reciprocating movement of uniform extent into a differential movement in another direction. The mechanism, for instance, may be used for operating the drop-boxes of a loom or for shifting blocks on the platen of a color-printing press, or for other purpose, the device being shown in the drawings, for convenience, as applied to the operation of the shuttle-boxes of a loom.

A is one of the fixed side frames of the structure, and B a pivoted frame, which in this case is the lathe of the loom. This frame has at the upper end guides for the boxes D, to which differential movement is to be imparted, these boxes being carried by a guided rod, *a*. To this rod is secured a bracket, *b*, from which projects a pin, *d*, adapted to a slot, *d'*, in a cam, F, the latter being secured to a shaft, *g*, which is confined laterally to but is free to turn in a bearing, *e*, upon the frame B.

Secured to the frame B is a notched disk, *f*, with which engages lugs *i* on a collar, *c*, the latter being free to slide on the shaft *g*, but being prevented from turning independently thereof by a key-seat and feather or equivalent means, and being acted on by a spring, *h*, the

outer bearing of which is against a fixed collar, *h'*, the tendency of said spring being to maintain the lugs *i* in engagement with the notches of the disk *f*.

Hung to a fixed arm, *k*, projecting from the frame B, is an arm, H, having a toothed segment, I, which gears into a spur-wheel, G, on the shaft *g*, said arm H also carrying projecting arms J J', which form in effect the two arms of a lever having the arm *k* as its fulcrum. These arms J J' are not parallel with the central line of the arm H, each of the arms J J' being inclined forward from said central line, and being in the path of projections M on a plate, N, which has a slot, *m*, for the reception of a guiding-lug, *n*, projecting from the fixed frame A of the machine. This plate N is connected by a rod, *p*, with a weighted arm, P, hung to the frame A, and acted upon by pins on a pattern-chain, S. The frame B is intended to be vibrated and the drum of the pattern-chain intermittently rotated from some shaft of the machine of which the device forms part, so that there will be a movement of the pattern-chain to the extent of one pin for each vibration of the frame B. As the frame swings forward it carries with it the shaft *g* and arm *k*, and the arms J J' are brought into contact with the projections M of the plate N. If the arm H is in such position that one of the arms J J' is projected to a greater extent than the other, this projecting arm will strike the corresponding projection of the plate N, and will be moved rearward until the other arm comes into contact with the other projection of said plate, there being a corresponding movement of the arm H, segment I, spur-wheel G, and cam F, so as to effect the desired movement of the rod A. The extent and direction of movement will be governed by the position of the plate N. Thus, supposing the rod *a* to be at the limit of its upward movement and the plate N at the limit of its upward movement, a drop of said plate N will cause the lower arm, J', to strike the lower projection of said plate, and before contact of the upper arm, J, with the upper projection the lower arm will have been moved rearward to an extent commensurate with the drop of the plate, thereby causing such an operation of the cam F as to

lower the rod *a* to an extent directly proportionate to the extent to which the plate *N* has been lowered.

In order that the distance between the contact-points on the two cams may be alike in all of the positions to which said arms are adjusted, each arm has on the contact side a bevel, *x*, the bevel of each arm resting in contact with the projection *M* when the arm is in its highest position. Where more than three changes of position are necessary, the arms should be properly formed on their contact sides to preserve the same distance between them when in contact with the projection *M* whatever the adjustment of the arms may be. The shaft *g*, after each adjustment, is locked by the engagement of the lugs *i* of the collar *c* with one or other of each set of notches of the fixed disk *f*, the tension of the spring *h* being such that while it can be easily overcome when the arms *J J'* are subjected to the action of the projections *M* it will prevent the accidental displacement of the shaft *g* and the parts carried thereby.

In order to prevent breakage of any of the parts when there is any obstruction preventing the movement of the boxes or other devices connected to the rod *a*, the arms *J J'* are pivoted to the arm *H*, and are under the influence of a spring, *H'*, carried thereby, so that the movement of either arm *J J'* is transmitted to the arm *H* through the medium of this spring, the latter yielding whenever there is any undue resistance to the movement of the arm and its segment *I*.

While the projections *M* of the plate *N*, so far as their action upon the arms *J J'* is concerned, may fairly be considered the equivalents of the bolts *M M* of the device shown in my former patent, the use of the sliding plate, in combination with the inclined arms *J J'*, effects an important advantage over said patented device in that it enables me to dispense with the locking bolt and levers shown in said patent, the thrust upon the plate *N* being in a line at right angles to the line of guidance of said plate, so that there is but little, if any, tendency of the plate to be moved vertically from its proper position when either of the arms *J J'* is brought into contact with the projections of said plate. For additional security, the guide-slot in the plate *N* may be somewhat wider than the guide-lug, and the adjacent faces of the plate and lug may be serrated, as shown in Fig. 6, so that the first effect of the contact of either of the arms *J J'* with one of the projections *M* is to force the plate *N* rearward, so as to cause these serrated faces to engage with each other and thus effectually lock the plate, so far as vertical movement is concerned, as long as pressure is exerted upon it.

Various modifications of the means whereby

the movements of the arms *J J'* are transmitted to the rod *a* will suggest themselves to those familiar with mechanical devices—such modifications, for instance, as are described and illustrated in my former patent.

I claim as my invention—

1. The combination of a vibrating or reciprocating frame, a lever hung thereto, and an adjustable plate for acting upon said lever as the frame vibrates or reciprocates, the contact-surfaces of the lever-arms being inclined in respect to each other, all substantially as specified.

2. The combination of a vibrating or reciprocating frame, a rod guided thereon but free to move in a direction different from that of the movement of the frame, a lever hung to the frame, means whereby the movement of the lever is transmitted to the rod, and an adjustable plate for acting upon the lever as the frame vibrates or reciprocates, the contact-surfaces of the lever-arms being inclined in respect to each other, all substantially as specified.

3. The combination of a vibrating or reciprocating frame, a rod guided thereon but free to move in a direction different from that of the movement of the frame, a lever hung to the frame, means whereby the movement of the lever is transmitted to the rod, an adjustable plate for acting upon the lever as the frame vibrates or reciprocates, and a pin chain or pattern device for adjusting said plate, the surfaces of the lever-arms with which the plate comes in contact being inclined in respect to each other, all substantially as specified.

4. The combination of a vibrating or reciprocating frame, a lever hung thereto and having spring-arms *J J'* with contact-surfaces inclined in respect to each other, and an adjustable plate for acting upon said inclined arms as the frame vibrates or reciprocates, all substantially as specified.

5. The combination of a vibrating or reciprocating frame, a lever hung thereto and having arms *J J'* with contact-surfaces inclined in respect to each other, a spring-retainer for holding the lever in position in the intervals between its movements, and an adjustable plate for acting upon said inclined arms *J J'* as the frame vibrates or reciprocates, all substantially as specified.

6. The combination of the adjustable plate *N*, having a ratcheted slot, with the ratcheted guide-lug, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOS. C. POTTS.

Witnesses:

JOHN E. PARKER,
HARRY SMITH.