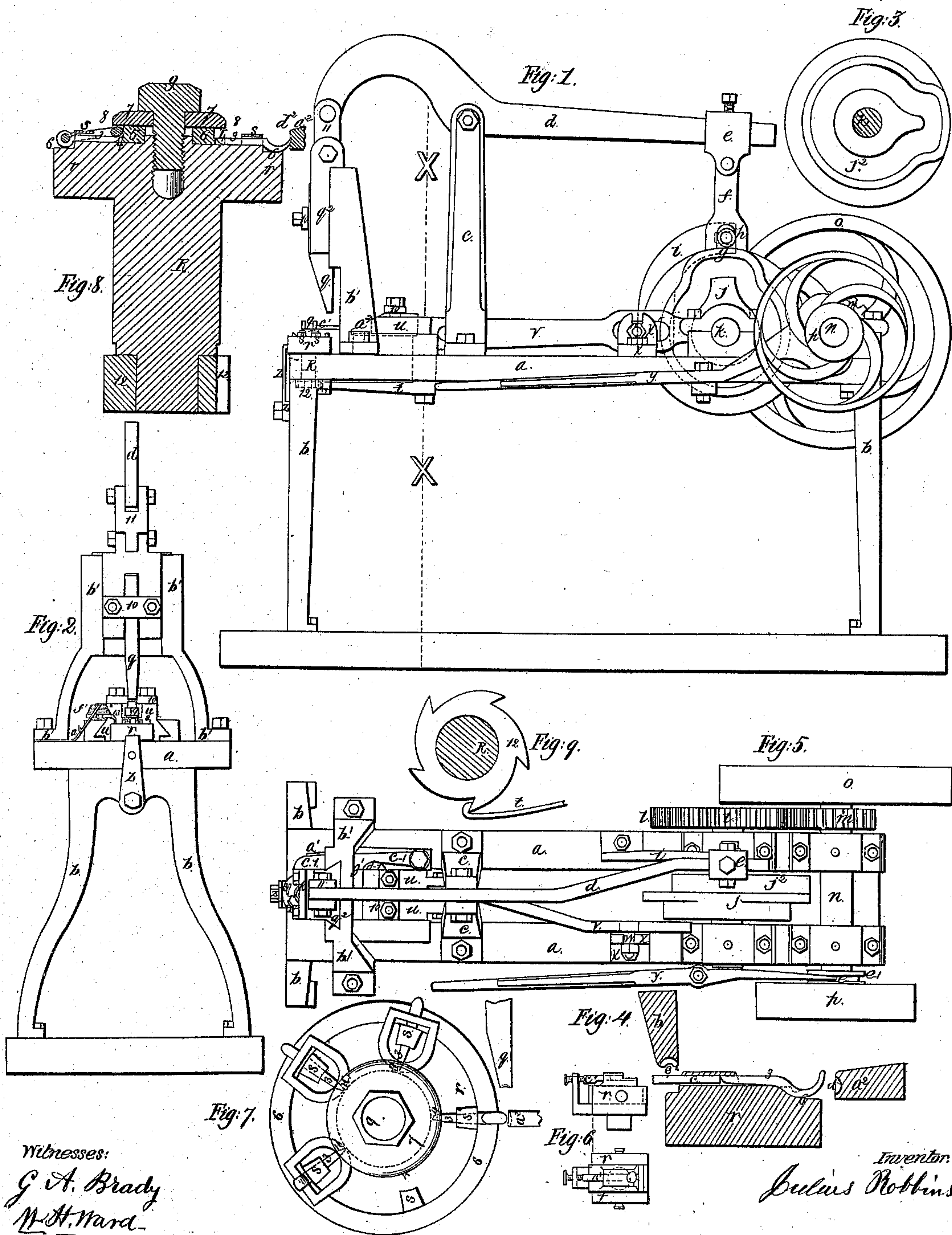


J. Robbins.
Buckle Machine.

N^o 97,700.

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Witnesses:
G. A. Brady
M. H. Ward.

Inventor:
J. Robbins

United States Patent Office.

JULIUS ROBBINS, OF AUBURN, NEW YORK.

Letters Patent No. 97,700, dated December 7, 1869.

IMPROVED MACHINE FOR MAKING BUCKLES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, JULIUS ROBBINS, of Auburn, in the county of Cayuga, and State of New York, have invented certain new and useful Improvements in Machines for Affixing Tongues to Buckles; and I do hereby declare that the following is full, clear, and exact description of the same, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a side elevation of a machine embracing my improvements.

Figure 2 represents an elevation of the front thereof.

Figure 3 represents a view of the cam for operating the vertically-sliding tool for bending and forming the eye of the tongue.

Figures 4 and 6 represent views, showing modifications of the mechanism for holding the buckle and tongue while being united.

Figure 5 represents a plan or top view of the machine.

In the accompanying drawings—

a represents the bed-plate, upon which the several parts of the operating-mechanism of the machine are secured.

It is of suitable dimensions, mounted upon legs *b*.

Upon one end of this bed-plate, the mechanism for uniting the tongues to their buckles, is arranged, and at the opposite end, the driving and operating-mechanism.

The mechanism for holding and presenting the buckles and tongues in proper position to be united by the upsetting and bending-tools, consists of a horizontal circular head-block, *r*, having a cylindrical shank or stem, *R*, which passes through an opening in the bed-plate, and by which it is secured thereto.

This head-block *r* is of a diameter to admit a number of buckles to be arranged thereon near its circumference, as shown in Figure 7, which is a top view of the revolving head-block, at equal distances apart, so that they shall be presented for the action of the proper tools in moving through an arc exactly equal to the intermittent motion of said head-block, as will be presently described.

The tongues 3, being separate from the buckles, have the proper shape and finish given to them, with the flattened end curved slightly upward, as shown in Figures 4 and 8, and are secured to the upper face of the head-block *r*, by being fitted in openings in ears or receiving-places *s*, raised thereon, while their points are held in notches 4, figs. 7 and 8, formed in the circumference of an annular shoulder, 5, on the said head-block *r*, concentric with the axis thereof, by which means, the tongues 3 are locked in their proper positions.

The concentric shoulder, while serving to hold the

ends of the tongues 3 in position, also serves as a seat for the inner sides of the buckles, while the outer bar of the buckle rests upon the flattened curved end of the tongues, which rest upon an annular recess, 6, adjacent to the circumference of said head-block; and in order to maintain the buckles in proper position upon the tongues 3, I secure a horizontal disk or plate, 7, upon the concentric shoulder 5, so that its circumference overlaps the seat of the concentric shoulder, in such manner as to leave an annular space, 8, between the two, equal to the thickness of the ends of the buckles, so that when the latter are inserted within the annular groove 8, they will fit tightly therein, and be clamped and held in position during the rotation of the head-block *r*, as shown in figs. 7 and 8.

The holding-disk 7, is secured to the head-block *r*, by means of a central screw, 9.

This intermittently-revolving head-block *r*, is located so that its circumference will be flush with the end of the bed-plate upon which it is supported; and immediately in the rear thereof, and in a line with the centre of the bed-plate, I arrange a bending-tool, *a*², figs. 1, 4, 7, and 8, so that its acting-end will be contiguous to the circumference of the head-block *r*, and in a position to advance against and upset the end of the tongues 3.

This upsetting-tool *a*², therefore, has a longitudinal reciprocating movement, and is mounted upon a carriage or cross-head, *u*, fitted in ways upon the bed-plate.

Immediately above the inner circumference of the intermittently-revolving head-block *r*, I arrange a vertically-reciprocating tool, *q*, for bending the end of the tongue 3, already upset, so as to complete the operation of forming the eye of the tongue over the bar of the buckle.

This vertically-reciprocating tool *q*, is secured to a vertically-sliding carriage or cross-head, *q*², moving in ways in a transverse frame, *b*², supported by standards erected on the bed-plate.

The reciprocating tools thus arranged, are secured in openings in their respective cross-heads, by means of clamping-plates 10, so that they may be adjusted nearer to or further from the intermittently-revolving head-block *r*, so as to make their movement such as to effect the proper action in bending and forming the eye of the tongue.

The acting-ends of the horizontally and vertically-reciprocating tools, are provided with cavities *d*² *e*², as shown in figs. 4 and 8, of the proper shape to receive the end of the tongue, in upsetting and bending the same.

The reciprocating movement of the horizontal upsetting-tool *a*² is effected by means of a connecting-rod, *v*, united, by a joint, to the rear end of the hori-

zontal cross-head u , and connected at its opposite end, by an anti-friction roller, to a cam, j , of peculiar shape, represented in fig. 1 of the drawings; and in order that the rear end of this connecting-rod r may be held in a fixed position vertically, and at the same time allow it to move back and forth, it is connected by a slot, fig. 1, within which is secured an anti-friction roller, w , secured in a stud, x , on the bed-plate.

The cross-head of the vertically-reciprocating tool q^2 , is connected to and receives its motion from a walking-beam, d , mounted in bearings in standards c , erected upon the bed-plate, intermediately between the said vertically-acting tool q , and the cam j , from which it derives its motion.

The opposite end of this walking-beam is connected by a vertical link, f , the lower end of which carries an anti-friction roller, fitted to move within the groove of a cam, j^2 , of peculiar shape, as shown in fig. 3 of the drawings, located and arranged upon the same axis of the cam j , for operating the horizontal tool.

In order to maintain the vertical link in its proper position to receive the action of the cam j^2 , and allow it to rise and fall, it is provided with a slot, g , to receive an anti-friction roller, h , fixed upon the upper end of a curved arm, i , secured upon the bed-plate, so as to hold in position against the action of the groove j^2 , figs. 1 and 5, whilst it is permitted to rise and fall freely.

In order to allow of the free movement of the vertical cross-head q^2 , it is connected, by a hinged or pivoted link, 11, to the front end of the walking-beam d , while the rear end of the latter is pivoted, by an adjustable box, e , to the vertical link f , and thus permits the several parts to operate without binding.

The two cams, thus located and arranged, do not operate simultaneously, but give motion to the acting-tools, so that the horizontal one, a^2 , shall first bend the end of the tongue, to be followed immediately by the descent of the other, q .

The intermittent motion of the horizontal-revolving head-block r , to present, in regular succession, the buckles and tongues to the acting-tools, to have their parts united and carried out of the way, is effected by means of a ratchet or toothed wheel, 12, as shown in Figures 1 and 9, secured on the end of the shank or stem R of the head-block r , directly beneath the bed-plate; and a spring-toothed arm, t , is connected by means of a stud, fig. 1, projecting through an opening in the bed-plate, from the under side of the cross-head u , of the horizontally-reciprocating upsetting-tool a^2 , so as to cause the said toothed-spring arm t , to move back and forth with it.

The teeth of the ratchet-wheel and the tooth of the spring-arm are of such shape as that the spring-toothed arm t , on its advance movement, will move over the teeth of the ratchet without turning it, while its receding movement will cause the two to bite into each other, and thus turn the ratchet-wheel, and, with it, the head-block r .

The stroke of the horizontal cross-head, therefore, and the distance between the teeth of the ratchet-wheel 12, fig. 9, (which latter is a horizontal section of the toothed feeding-wheel and its operating-arm,) and the spaces between the buckles of the revolving head-block r , as shown in fig. 7, (which is a full-sized representation,) must be so proportioned and regulated as that each vibration of the horizontal spring-toothed arm t , will turn the circular head-block r , a distance exactly equal to that between the buckles thereon, and thus never fail to present the shank of the tongue 3 in a line directly with that of the upsetting-tool a^2 .

As each buckle is completed, it is carried out of the way by the rotation of the head-block r ; and in order to detach it therefrom, to give place to a new tongue and buckle, I arrange, at that side of the head-block which carries the finished buckle from the tools, a

spring-detaching arm, c' , figs. 1, 2, and 5, connected by pivot to the ways of the cross-head of the horizontal upsetting-tool.

The acting-end of this detacher c' is in a line with the diameter of the revolving block r , at right angles to the movement of the horizontal upsetting-tool, and is provided with a hook, 13, whose function is to pass over the outer bar of the buckle, so as to lock itself therewith, to remove the finished buckle.

This is accomplished by means of a cam-shaped projection, d' , (see fig. 5,) on the side of the cross-head, arranged in such manner, relatively to the spring-hook c' , as that, upon the advance movement of the upsetting-tool, the cam will strike a shoulder, g' , on the said spring-arm, and force it outward from the revolving head-block, and with it the buckle, which being held, by the overlapping disk 7, upon the head-block, needs only to be drawn out to be detached therefrom, and the receding movement of the upsetting-tool will release its cam from the spring-arm, when the latter will be forced in again, to lock itself with the next finished buckle, by means of a spring, a' , (see fig. 2,) which constantly tends to press the detacher c' toward the rotating head-block r .

In giving motion to the rotating head-block by means of the toothed spring-arm t and ratchet-wheel 12, it would be liable to be moved a little too far, and thus carry the buckle-tongue out of line with the upsetting-tool.

To prevent this, therefore, I attach a friction-spring, z , in any convenient manner, to the bed-plate, so as to constantly bear against the circumference of the rotating head-block r , and thus act as a brake to its motion, so that the tongue will always be presented in a line with the upsetting-tool, and also hold it in position while the spring-toothed arm t is moving over it, to lock itself with one of the teeth of the ratchet 12.

The mechanism for giving motion to the several parts of the machine consists of a transverse shaft, n , located and fitted in bearings at the rear end of the bed-plate, carrying at one end a driving-pinion, m , which matches with a cog-wheel, 7, on the end of the cam-shaft k ; and on the opposite end of the transverse shaft n , is a pulley, p , over which the band from the driving-power passes; and to give evenness to the motion of the several parts, a fly or balance-wheel, o , is arranged on the end of the driving-shaft next the driving-pinion.

To throw the machine into and out of gear, I pivot a clutch-lever, y , to the side of the bed-plate, so as to lock and unlock the band-wheel, with a clutch, e' , on the driving-shaft, in the ordinary manner.

The operation of the machine is as follows:

The operator seats himself in front of the machine; places a number of tongues and buckle-frames upon the face of the rotating head-block. The clutch is then thrown into gear with the driving-band wheel p , which puts the machine in motion; and each revolution of the cam j causes the horizontal tool a^2 to advance, and upset the end of the tongue 3, which is held rigidly upon the rotating horizontal head-block r , so that its end projects beyond the circumference thereof, and as it cannot yield, will receive a sharp curve, corresponding to the cavity d^2 , in the upsetting-tool; and by the same movement, the horizontal spring-toothed arm t is caused to advance, and interlock itself with one of the teeth of the ratchet-wheel 12. At this moment, the vertical tool q is caused to descend, and coming in contact with the already sharply-curved end of the buckle-tongue, presses it downward, and completes the formation of the eye of the tongue around the bar of the buckle, as shown in fig. 8.

The tools are then caused to recede simultaneously, while at the same moment, the spring-toothed hook t being also drawn back, causes the rotating head-block

r to revolve a sufficient distance to carry the finished buckle out of the way, and present another one in its stead in the line of the upsetting-tool. At the same moment, the receding of the upsetting-tool causes the toothed detach-er *c'* to approach the head-block *r*, and by the action of the spring *a'*, to carry the detach-ing-tooth 13 over the bar of the finished buckle, so that when the upsetting-tool again advances, the cam *d'* upon its cross-head strikes against the shoulder *g'* of the said toothed detach-ing-arm, and imparts to it a lateral movement, and thus detaches the buckle, by drawing it laterally from its seat on the head-block, and delivering it upon the bed-plate.

As each finished buckle is removed, the operator, sitting in front of the machine, inserts in each vacant place a tongue and buckle, to be carried around and united in the manner before described, so that the operation of affixing tongues to buckles is a continuous one.

Figs. 4 and 6 represent a plan, elevation, and section of devices not intended to rotate, but to take the place, as modifications of my invention, of the rotating head-block, in which case, a single tongue is inserted in a fixed head-block, and supported against the action of the upsetting-tool by means of an adjustable stop.

Having described my invention,
I claim—

1. The intermittently-rotating head-block *r*, constructed with an annular holding-seat, 8, for the buckle-frames, and eyes *s*, and notches 4, for holding the tongues in place during the operation of uniting them with the buckles, substantially as before described.

2. The combination of an intermittently-rotating head-block, *r*, with the toothed detach-ing-arm *c'*, for the purpose of removing the finished buckle from said head-block, substantially as before described.

3. The combination of the intermittently-rotating head-block *r*, constructed as described, with the horizontal and vertical upsetting and bending-tools *a'* *q*, constructed, arranged, and operating, as herein described.

4. In combination with horizontally and vertically-reciprocating upsetting and bending-tools, the feeding-arm *t*, with its toothed wheel 12, the intermittently-rotating head-block *r*, with its friction-brake *z*, and the detach-ing spring-toothed arm *c'*, the whole arranged and operating as described.

5. The arrangement of the walking-beam *d*, the connecting-arm *v*, and the cams *j* and *j'*, the bar *e*, link *j*, and arm *i*, for giving motion to the acting-parts of the machine, as herein described.

JULIUS ROBBINS.

Witnesses:

HORACE T. COOK,
CHARLES WARD.