(No Model.)

2 Sheets—Sheet 1.

G. W. LORE.

MACHINE FOR SEAMING CANS.

No. 383,400. Patented May 22, 1888.

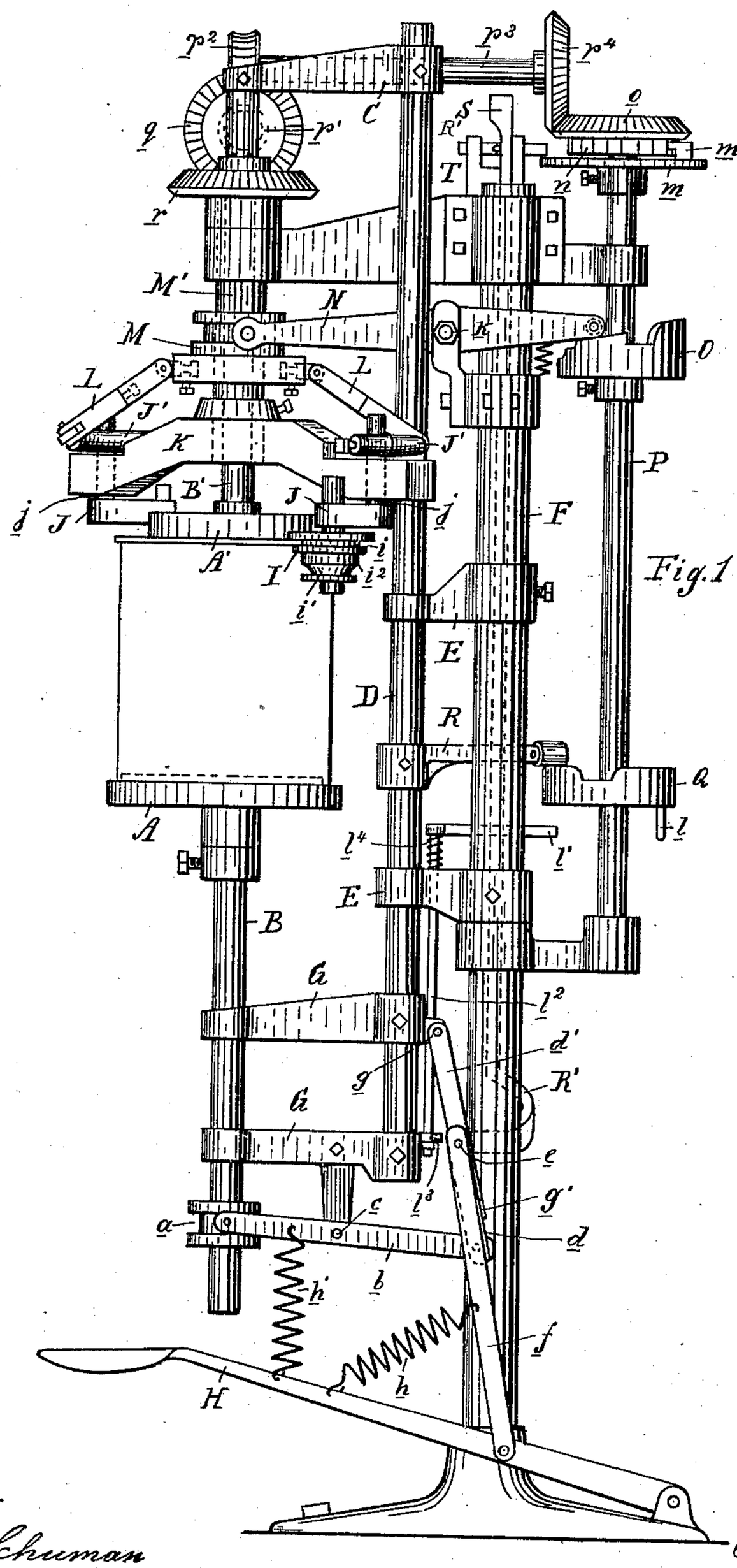

Fig. 1

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(No Model.)

2 Sheets—Sheet 2.

G. W. LORE.

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Fig. 2

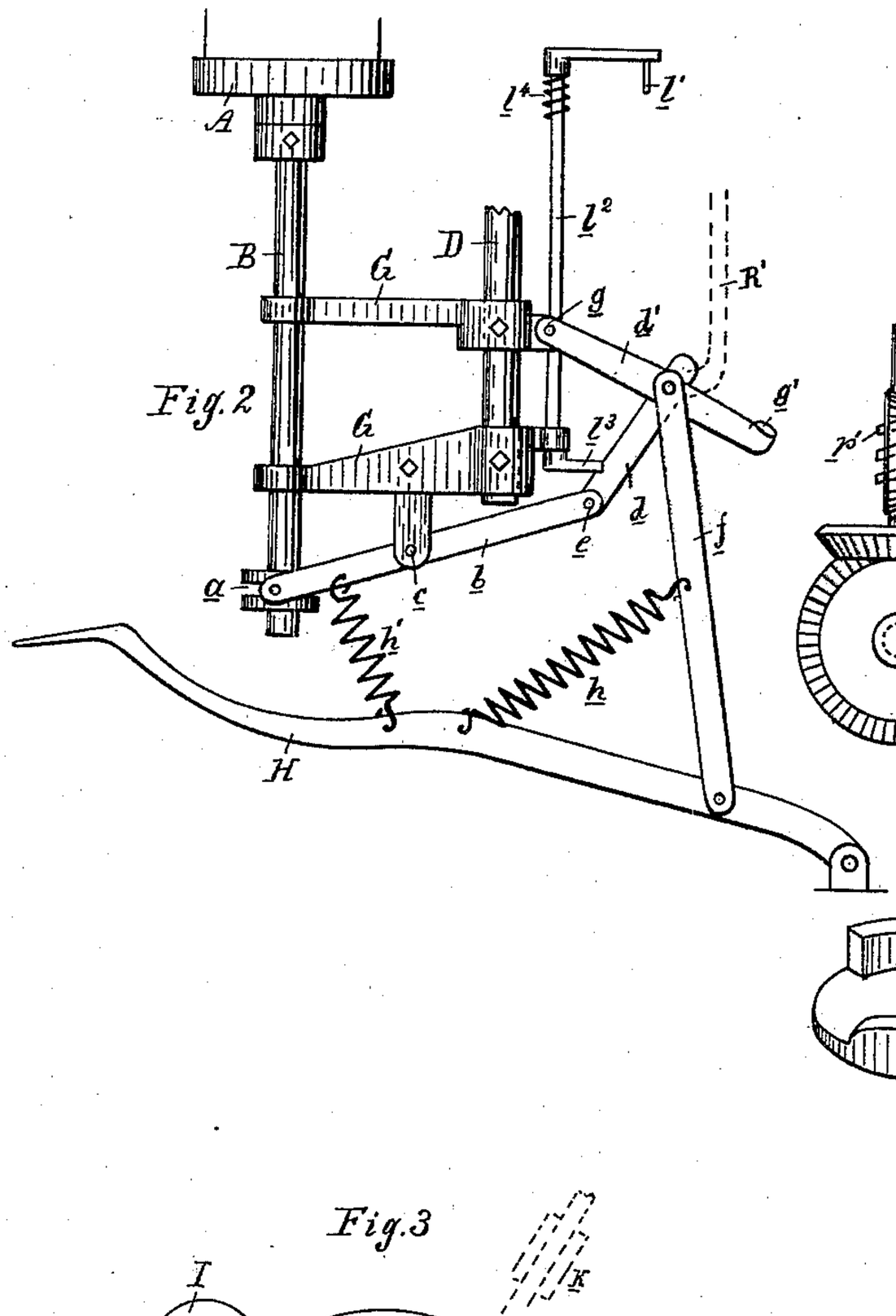


Fig. 4

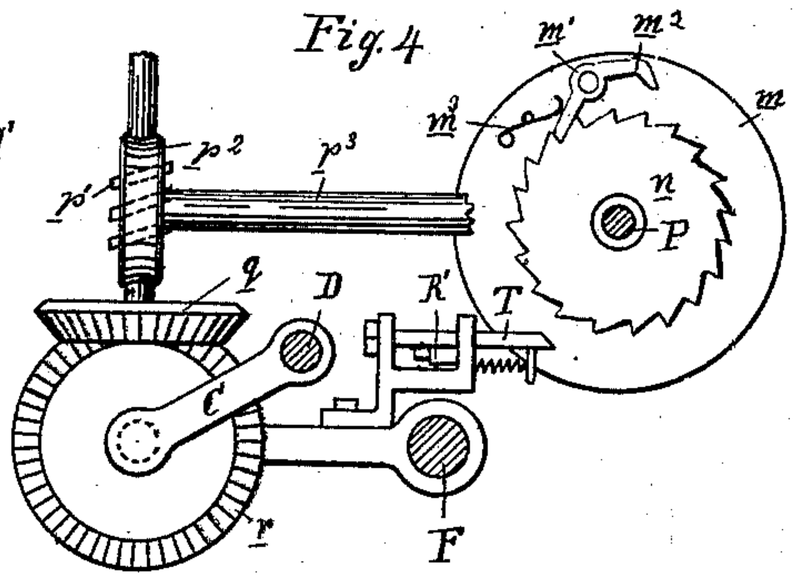


Fig. 9

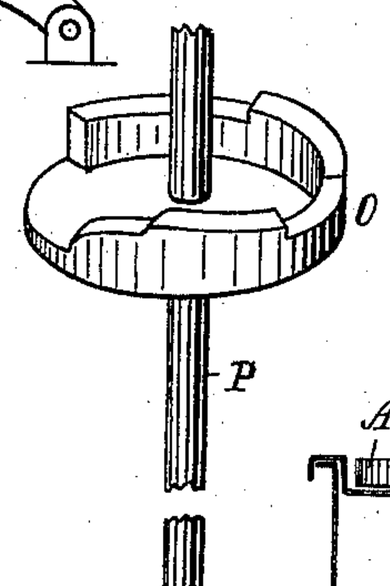


Fig. 5

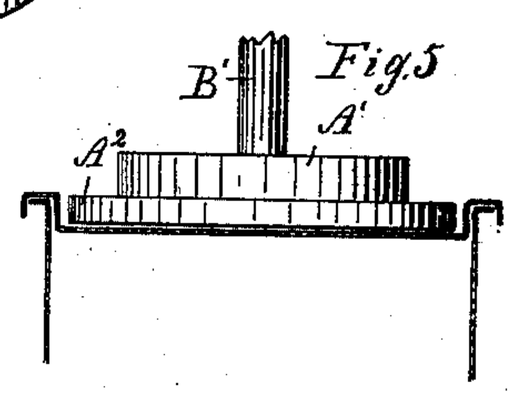


Fig. 10

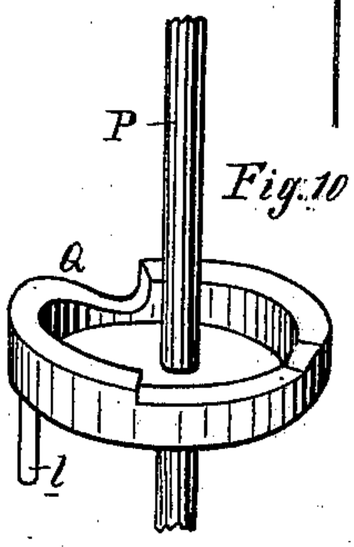


Fig. 3

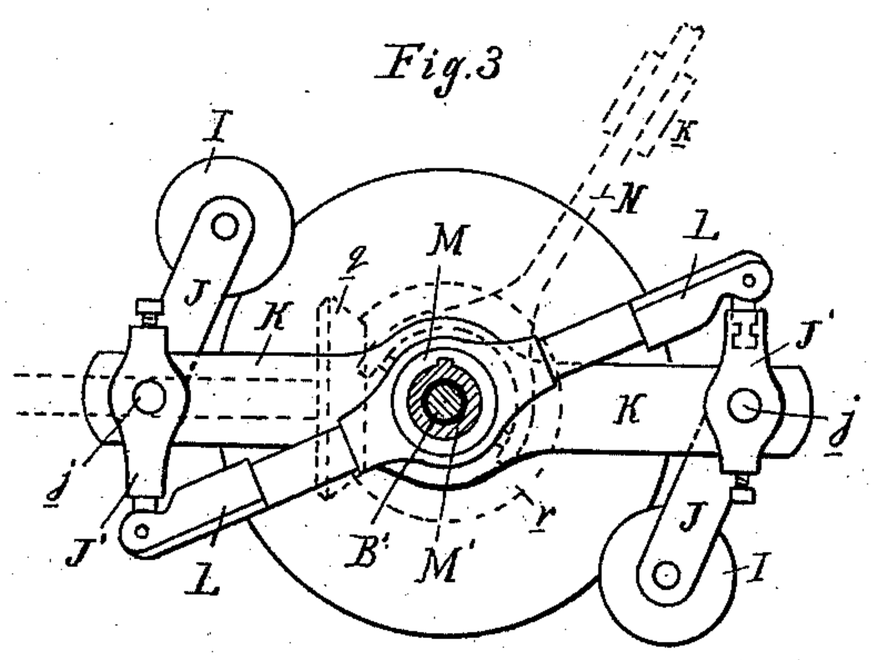


Fig. 6

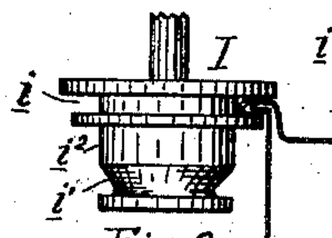


Fig. 7

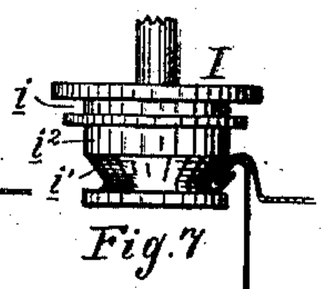
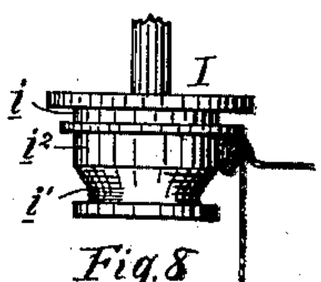


Fig. 8



Attest:
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Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE W. LORE, OF DETROIT, MICHIGAN, ASSIGNOR OF FOUR-FIFTHS TO GEORGE L. SILL, CHARLES T. SILL, LOUIS W. BRIGGS, AND JAS. S. SPENCER, ALL OF SAME PLACE.

MACHINE FOR SEAMING CANS.

SPECIFICATION forming part of Letters Patent No. 383,400, dated May 22, 1888.

Application filed February 23, 1888. Serial No. 265,007. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. LORE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Machines for Seaming Sheet-Metal Cans, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in machines for seaming sheet-metal cans, more specifically designed for securing heads to the body of the can by means of a double seam.

The invention consists in the peculiar construction, arrangement, and combination of the parts, whereby the can-body with the head is held between non-rotatable chucks, which are slidingly secured while the seaming is effected by means of a seaming-roller rotated around the head and pressed against it or removed from it by expanding and contracting mechanism.

The different steps in the seaming are executed by the same roller, which for this purpose is provided with a complete set of seaming devices, which are successively brought into action simultaneously with a sliding movement of the chucks, which carry the head of the can into proper position relative to the seaming devices. Automatic mechanism is provided to perform all the steps of seaming in a continuous operation.

In the drawings which accompany this specification, Figure 1 is an elevation of my machine. Fig. 2 is an elevation of the lower portion of the machine, illustrating the operation of the break-joint. Fig. 3 is a plan of the seaming-rollers and their actuating mechanism. Fig. 4 is a plan showing the drive mechanism. Figs. 5, 6, 7, and 8 are cross sections through the can, illustrating the operation of the seaming-roller in its different positions. Figs. 9 and 10 are detached perspective views of the cams on the cam-shaft.

A is the lower and A′ is the upper chuck, between which the can and head are clamped. B and B′ are shafts to which these chucks are respectively secured. These shafts slide in suitable vertical bearings, but are non-rotatable. The shaft B′, carrying the upper chuck, is secured at its upper end to the arm C, which is also secured to the frame or bar D, which slides in vertical bearings E, secured to the main standard or frame F, which latter supports all the operating parts of the machine. The shaft B, which carries the lower chuck, slides in vertical bearings G, secured to the sliding frame D, and is provided at its lower end with the grooved collar *a*, into which engages one end of the lever *b*, fulcrumed at *c* to the sliding frame D, or any part thereof. The rear end of this lever is pivotally connected with one of the two toggle-levers *d d′*, which form the break-joint *e*. A link, *f*, connects the break-joint pivotally with the foot-lever H. The toggle-lever *d′* is pivotally connected to the sliding frame D at *g*, and is provided with the heel-extension *g′*, which prevents the straightening of the toggle beyond the locking position, as shown in Fig. 1. Suitable springs, *h h′*, are arranged to normally hold the parts in position, as shown in Fig. 2; but when the foot-lever H is depressed the springs serve to lock all the parts firmly in position, as shown in Fig. 1, thereby compelling the upper and lower chucks to be actuated together by the connecting-frame D.

I is a seaming-roller, of which there may be one or two, as desired. This seaming-roller is provided with the seaming-groove *i*, the curling-groove *i′*, and the flattening-groove i^2, arranged in vertical series.

J J′ are the two arms of a double crank-lever, fulcrumed at *j* to the end of the revolving head or frame K. The arm J carries the seaming-roller on the under side of the head K, and the arm J′ is secured on top of the head K, and has secured to its free end the link L, which is pivotally secured to the sliding collar M, which slides on the feather on the hollow shaft M′, to the lower end of which the head K is secured. The sliding collar M engages with one end of the cam-lever N, which is fulcrumed at *k* to the frame of the machine, and bears at its opposite end upon the seaming-cam O.

P is the cam-shaft, journaled in suitable vertical bearings and provided with the chuck-actuating cam Q, with which engages the arm

R, secured to the sliding frame D. A tripping-arm, *l*, is secured to the cam Q, and in a revolution of said cam is adapted to strike against the crank *l'* upon the rock-shaft l^2. To the lower end of the rock-shaft l^2 is secured another crank-arm, l^3, Fig. 2, adapted to strike against the break-joint *e*, and thereby effect the breaking of the joint, a spring, l^4, being arranged to keep the tripping-shaft in normal position.

To the upper end of the shaft P is secured the flange *m*, which carries the pawl *m'*, adapted to engage with the ratchet-wheel *n*, loosely mounted upon the shaft P. The ratchet-wheel *n* is provided with the bevel-gear *o*. Motion is carried to this bevel-gear *o* from the main drive-shaft *p* of the machine, which is provided with the worm *p'*, which meshes with the worm-gear p^2 upon the shaft p^3, and the bevel gear-wheel p^4 transmits motion to the bevel gear-wheel *o*. A bevel gear-wheel, *q*, upon the main drive-shaft *p* engages with the bevel-gear *r* upon the hollow shaft M', which imparts motion to the grooving-roller.

R' is a tripping-bar secured at the lower end to the break-joint *e*, and provided at the upper end with the head S, adapted to engage and operate the tripping-dog T, which slides in suitable bearings, as shown in Fig. 4, and projects normally into the path of the heel m^2 of the pawl. The head S of the bar R' when depressed withdraws the tripping-dog T and permits the spring m^3 to throw the pawl into engagement with the ratchet.

In practice the operation of the machine is as follows: In the starting position of the machine the break-joint is unlocked, as shown in Fig. 2. This withdraws the lower chuck, A, to its lowest position. The operator, placing a can with a loose head upon this chuck, then places his foot on the foot-lever H, and, forcibly depressing it, locks the break-joint, as in Fig. 1. The parts being properly adjusted, the can-head is now held securely between the upper and lower chuck, with the flange A^2 of the upper chuck forming a follower for the seam, as shown in Fig. 5. By the same movement of depressing the foot-lever the tripping-bar R' retracts the sliding dog T from the heel of the pawl *m'*, which thereupon engages with the ratchet *n*, and thereby communicates motion to the cam-shaft P. The cam O upon this cam-shaft thereupon actuates the cam-lever N, which, by raising and lowering the sliding collar M, effects the lateral movement of the seaming roller or rollers from or toward the head of the can, while at the same time the head K carries the seaming roller or rollers around the can. It will be seen that if the sliding collar M is depressed by the cam-lever the link or links L actuate the double crank-levers to carry the seaming roller or rollers toward the head, while the reverse movement is effected by the opposite movement of the cam-lever. Simultaneously with the operation of the cam O the cam Q operates upon the arm R to raise and lower the sliding frame D, which carries the chucks A A' up or down, holding at the same time the can clamped between them. One revolution of the cam-shaft P accomplishes the whole seaming operation, and during this operation the chucks A A' carry the can-head for a certain fraction of the revolution, first, in the relative position shown in Fig. 6, then in the relative position shown in Fig. 7, and then in the relative position shown in Fig. 8. In the relative position shown in Fig. 6 the seaming-groove *i* of the roller forms the seam by crimping over the flange of the head from its normal position. (Shown in Fig. 5.) In the relative position shown in Fig. 7 the curling-groove *i'* operates upon the seam to curl it over, and in the relative position shown in Fig. 8 the seam is flattened down and thus completed. The proper construction of the cams O and Q to effect this operation of the parts is thus easily determined. After one revolution of the shaft P is completed the break-joint is tripped by the operation of the devices before described, when the lower chuck is let drop and the can is released.

What I claim as my invention is—

1. The combination, in a can-seaming machine, of the non-rotating and vertically-sliding chucks for holding the can body and head, a seaming roller or rollers mounted upon a frame revolving around the head, expanding and contracting mechanism, substantially as specified, to bring said roller or rollers in or out of contact with the head, and mechanism for raising and lowering the chucks simultaneously, substantially as described.

2. The combination, in a can-seaming machine, of the chucks for holding the can body and head, the sliding shafts carrying these chucks, the connecting mechanism between the shafts to compel their joint operation, and the break-joint in said connection to permit the independent operation of one of said sliding shafts, substantially as described.

3. The combination, in a can-seaming machine, of the chucks for holding the can body and head, the vertically-sliding shafts carrying these chucks, the connecting mechanism between these shafts to compel their joint operation, the break-joint in this connection, the foot-lever for locking and the automatic tripping device for unlocking said break-joint, substantially as described.

4. The combination, in a can-seaming machine, of the non-rotating and vertically-sliding chucks for holding the can body and head, the seaming roller or rollers mounted upon a frame revolving around the head, a set of can-seaming devices on said roller or rollers in vertical series, the expanding and contracting mechanism to carry said seaming roller or rollers in and out of contact with the head, and automatic mechanism for raising and lowering the chucks simultaneously, whereby the different seaming devices of the roller or rollers are

brought into proper position relative to the head, substantially as described.

5. The combination, in an organized machine for double seaming can-heads to bodies, of the non-rotating chucks for holding the can body and head, the vertically-sliding shafts to which said chucks are secured, the break-joint connection between the lower and upper chuck, the seaming-roller provided with a set of seaming devices in vertical series, the revolving head carrying such seaming-roller, the expanding and contracting mechanism for operating said seaming-roller laterally toward and from the cam, with the chuck lowering and raising mechanism, the revolving cam-shaft for actuating said mechanism, the drive-connection for said shaft, the tripping-clutch in said drive-connection, the tripping-bar controlling said trip-clutch by the closing of the break-joint, the automatic trip controlling the breaking of the break-joint by the motion of the cam-shaft, and the foot-lever controlling the closing of the break-joint by the action of the operator, substantially as described.

6. The combination, in an organized machine for double seaming can-heads to bodies, of the non-rotating chucks for holding the can body and head, the vertically-sliding shafts to which said chucks are secured, a seaming roller or rollers provided with a complete set of seaming devices in vertical series, the double crank-lever, to one end of which said lever is mounted, the revolving head to which said crank-lever is fulcrumed, the shaft upon which said revolving head is mounted, the sliding collar upon said shaft, the link connecting the sliding collar with the crank-lever, the cam-lever engaging with the sliding collar, the seaming-cam actuating said cam-lever, the cam-shaft upon which said seaming-cam is mounted, the chuck-operating cam mounted upon the same shaft, the arm engaging with said chuck-operating cam, and the vertically-sliding frame which carries the chucks and to which the said arm is secured.

7. The combination, with the vertically-sliding chucks carrying the body and head of the can, of the seaming-roller revolving around the head of the can and provided with a set of seaming devices in vertical series, and mechanism, substantially as described, for bringing into operation the successive seaming devices of said roller, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses this 9th day of February, 1888.

GEORGE W. LORE.

Witnesses:
P. M. HULBERT,
JOHN SCHUMAN.