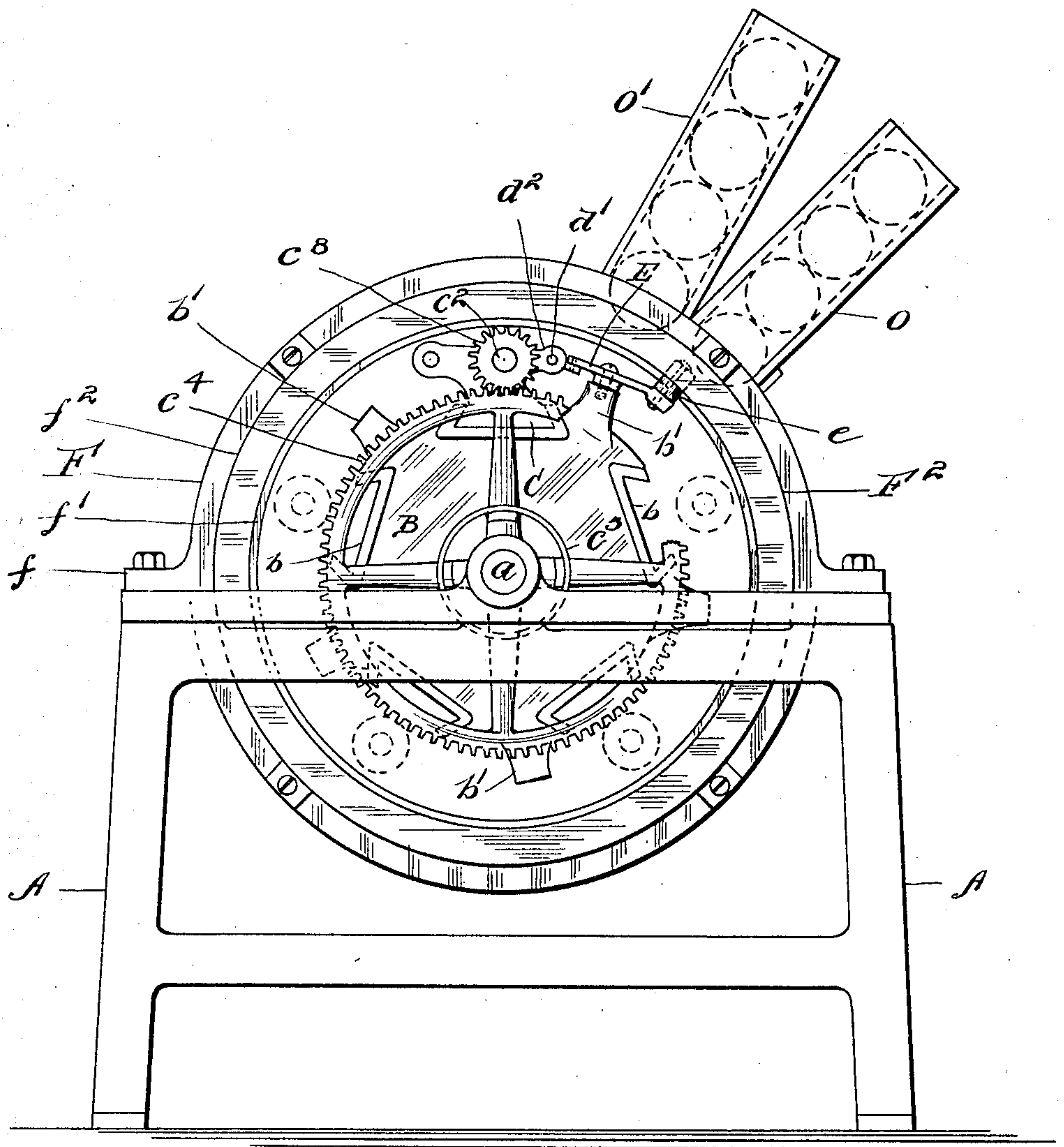


CAN MAKING MACHINE.

920,291.

4 SHEETS—SHEET 1.

Fig. 1



M. G. Noble

M. C. Siktberg

Eduard Ellefsen,

Louis Lambin,

By Glenn S. Noble
Att'y.

E. ELLEFSEN & L. LAMBIN.

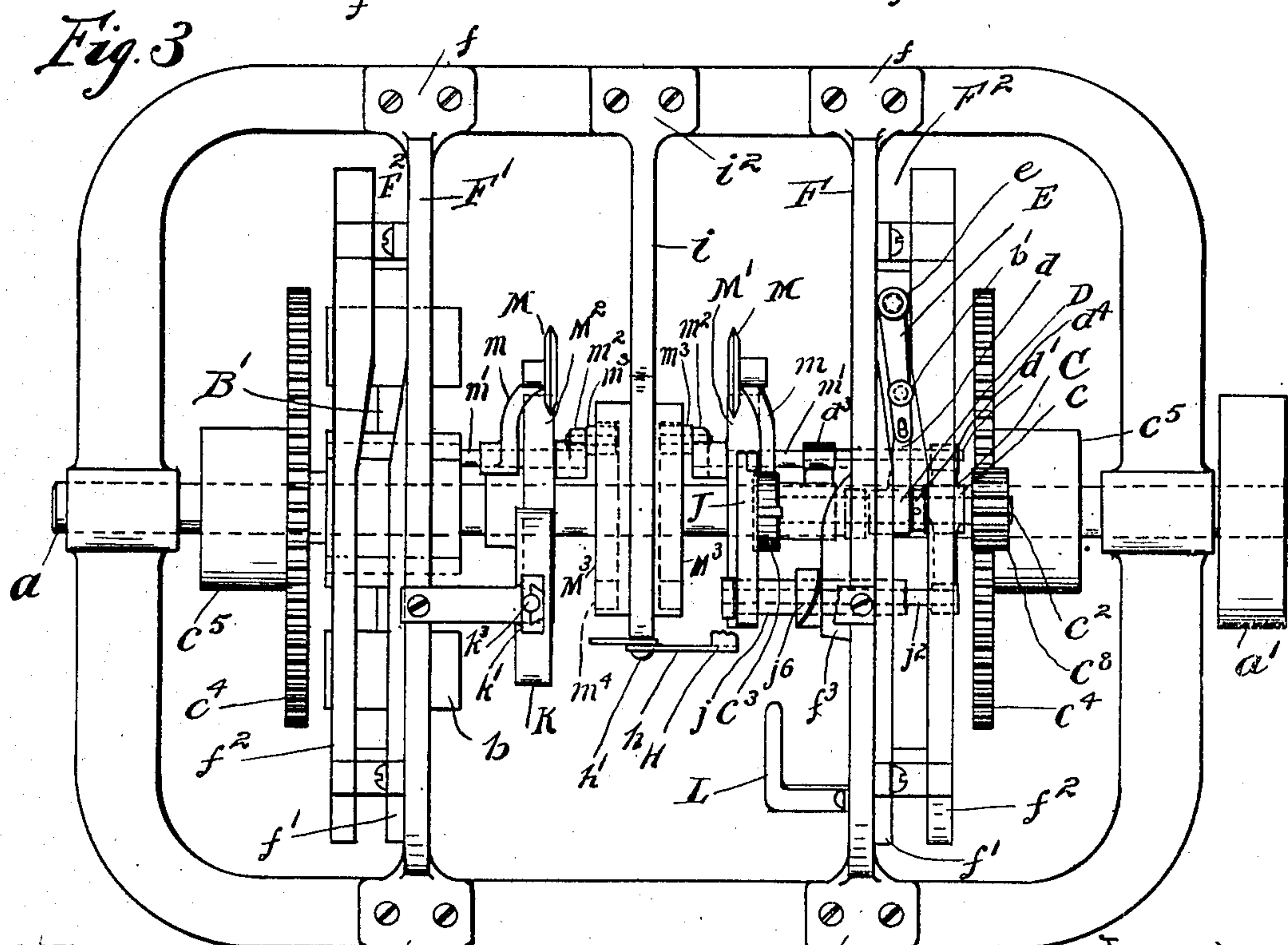
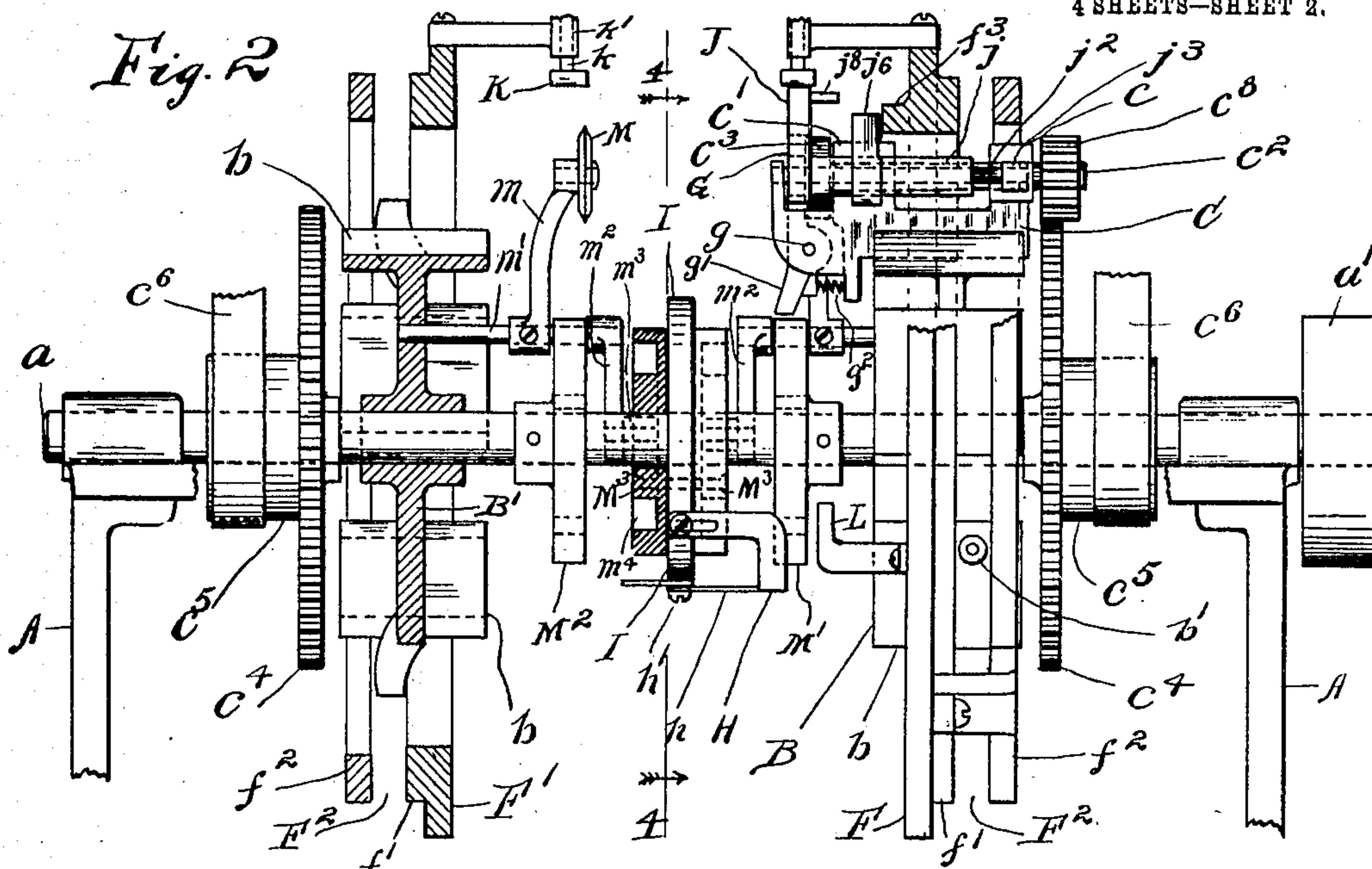
CAN MAKING MACHINE.

APPLICATION FILED APR. 14, 1904.

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Patented May 4, 1909.

4 SHEETS—SHEET 2.



Witnesses:

M. G. Noble

M. C. Siktberg

Inventors,

Edvard Ellefsen,
Louis Lambin,
By Glenn S. Noble
Att'y.

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4 SHEETS—SHEET 3.



M. G. Noble.

Inventors,

Edward Ellefson,

Louis Lambin,

By Glenn S. Noble

Att'y.

APPLICATION FILED APR. 14, 1904.

4 SHEETS—SHEET 4.

Fig. 6.

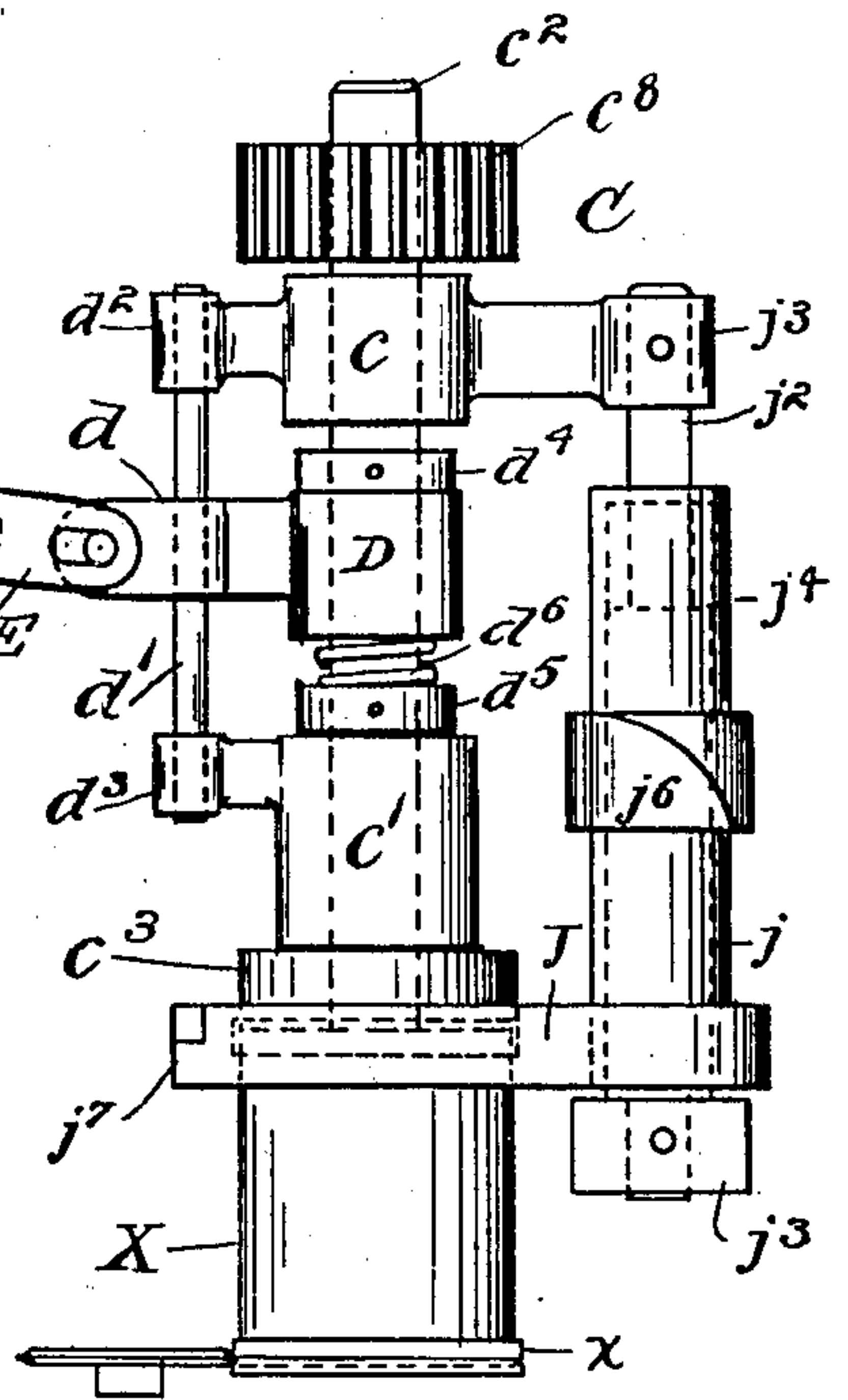
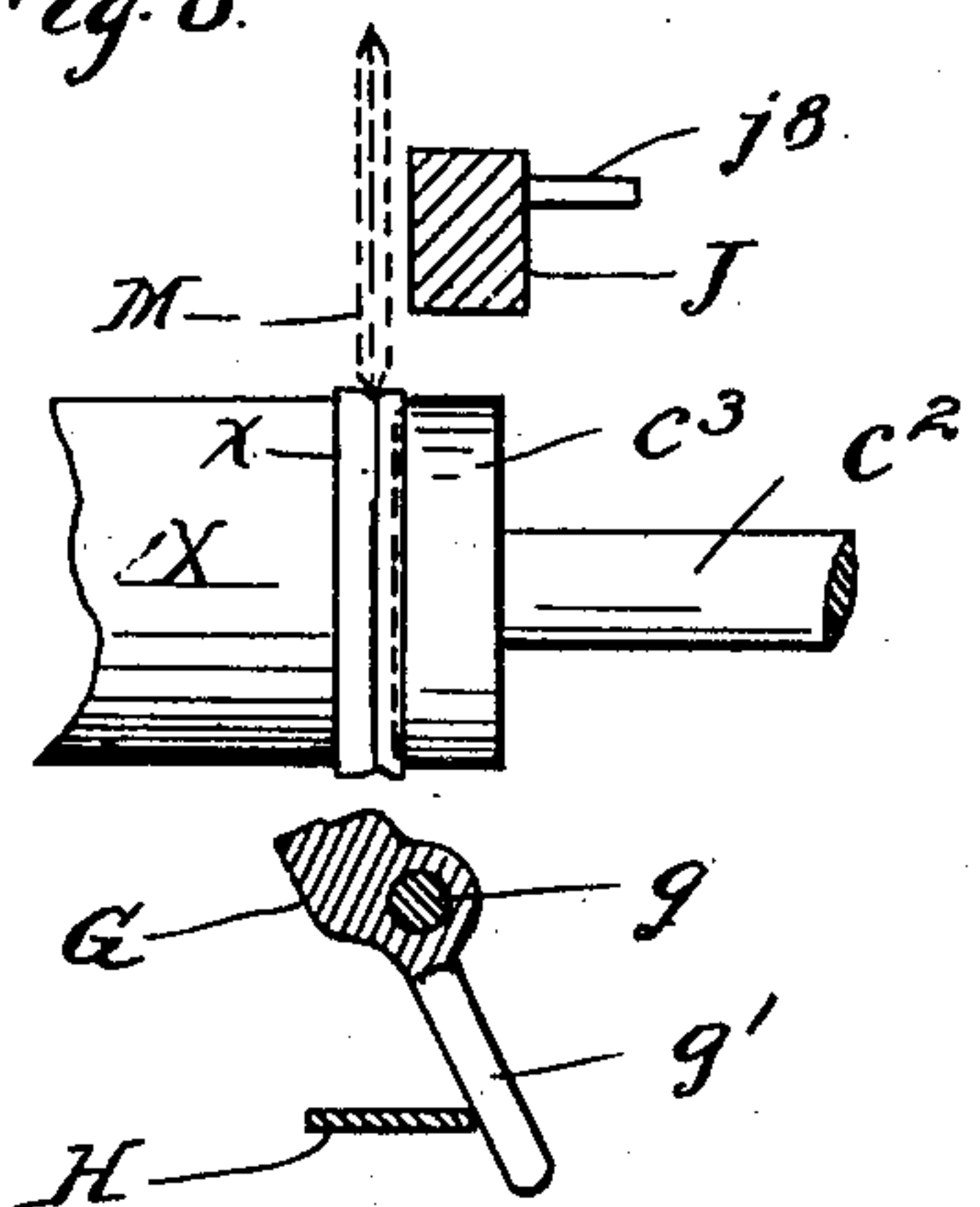


Fig. 8.



Inventors,

Edvard Ellefsen,
Louis Lambin.

By Glenn S Noble
Att'y.

UNITED STATES PATENT OFFICE.

EDVARD ELLEFSEN AND LOUIS LAMBIN, OF CHICAGO, ILLINOIS.

CAN-MAKING MACHINE.

No. 920,291.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed April 14, 1904. Serial No. 203,195.

To all whom it may concern:

Be it known that we, EDVARD ELLEFSEN and LOUIS LAMBIN, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Can-Making Machines, of which the following is a specification.

This invention relates more particularly to a machine which is adapted to force the two ends of a can onto the body thereof and also to crimp the ends or heads after they have been forced in position. The latter operation is desirable for closing the ends tightly upon the can bodies.

By means of this invention, a novel and efficient can-header is provided and also means whereby the cans are crimped before they are discharged from the machine. Its objects are to provide suitable mechanism to perform these operations, such mechanism to be of as simple construction as possible, consistent with the work to be performed.

In the accompanying drawings illustrating this invention, Figure 1 is an end view of the machine which is designed for five individual heading and crimping mechanisms, but for convenience in illustration only one of such mechanisms is shown. Fig. 2 is a partial front view of the machine, but in this view as in the subsequent views, parts are broken away, shown in section, or omitted in order to make the mechanism more readily understood. Fig. 3 is a top plan view of a machine. Fig. 4 is a sectional view taken on the line 4, 4 of Fig. 2 looking in the direction of the arrows. Fig. 5 is a detail showing one of the gripping devices detached, together with a can and the heads in position for heading. Fig. 6 is a view similar to Fig. 5 showing the parts in their relative positions after the jaws are closed and the can headed. Fig. 7 is an end view showing the gripping jaws open, and Fig. 8 is a detail showing the rotating spindle engaging with a headed can, the crimping wheel being indicated in dotted lines, and fragments of the open jaws being shown in section.

The mechanism will be more readily understood if the sequence of the operations, which are as follows, are kept in mind. The bodies and heads are fed into the machine, either simultaneously, or the bodies slightly in advance of the heads as is shown at O, O'. The upper grippers are forced in and down to coact with the lower saddles to hold the

bodies and heads in proper position and also to lock the saddles in position. The spindles with their ends for engaging the heads are next forced in and carry with them the slides carrying the grippers to force the heads on the bodies. The spindles and slides being held in this position, longitudinally, the upper jaw is thrown up and out to release the can and simultaneously the lower jaw is swung in and down, the headed can now being supported between the constantly revolving spindles. The crimping wheels next move toward the can and engage the heads to perform the crimping operation. As this is completed; the can is thrown out, the saddles again assume their normal positions and are ready to receive another body and heads.

The frame A is provided with suitable bearings for the main shaft *a* which may be driven in any suitable manner, as by a pulley *a'*. A pair of disks or wheels B, B' are rigidly mounted on the main shaft and are provided with one or more slideways *b*, in this instance five, for the slides C which carry the can gripping and heading mechanism. It is of course understood that the slideways are in alinement, so that corresponding heading mechanisms will coact to force the heads on the bodies received in oppositely disposed grippers. Each of the slides C is provided with bearings *c*, *c'*, for a revoluble spindle *c*² which is provided with an enlarged end *c*³ which is preferably beveled to engage with the slightly recessed can head as shown in Figs. 5 to 8. Each of the spindles *c*² may be revolved at any desired speed by means of gears *c*⁴ which mesh with large gears *c*¹ which are loosely mounted on the main shaft *a*. The gears *c*⁴ are driven by means of pulleys *c*⁵ and belts *c*⁶ from any convenient source of power. By means of this arrangement the five spindles at each end of the machine are all driven independently of the speed of the main shaft. The gears *c*⁴ are made with a sufficient face to allow for a slight longitudinal movement of the spindles without being thrown out of gear with the large gears *c*¹.

The spindles *c*² are provided with sleeves D loosely mounted thereon and having arms or lugs *d* extending to one side. The latter are bored to engage with guide rods *d'* secured in bearings *d*², *d*³ which are rigidly connected with the bearings *c*, *c'*. Collars *d*⁴, *d*⁵ are rigidly secured to the spindles *c*² and turned therewith. These collars are adapted to engage at times respectively with the inner

faces of the bearings c, c' , of the slides C. In order to reciprocate the latter a spring d^6 is interposed between the sleeve D and the collar d^5 in order to give a resilient pressure to the slide when it is moved in to head the can. There is a slight play between the collars d^4, d^5 and the bearings c, c' to allow for the forward movement of the spindle in order that its end c^3 may enter the recess in the can head before the slide moves forward to perform the heading operation. The outer ends of the arms d engage with levers E which are pivoted to lugs b' on the disks B, B'. The opposite ends of the levers E are provided with rollers e which engage with cam tracks F^2 which are adapted to give the lateral movement to the levers E in order to reciprocate the sleeves D to move the spindles and the heads. The cam tracks F^2 are preferably formed by means of rings F, F' which are rigidly secured by means of lugs f to the frame A and are provided with annular cam strips f' , which are beveled as shown in Fig. 3 to throw the rollers e out at the proper time. The corresponding cam rings f^2 are secured to the rings F, F' in order to hold the rollers e in engagement with the faces of the cam strips f' to give the proper reciprocating movement to the levers E.

Each of the slides C is provided with a saddle G which is pivoted at g to lugs c^7 on said slides. The saddles are provided with inwardly projecting arms g' which are adapted to engage with suitable cam strips H to throw the saddles in toward the center and away from the headed cans. Springs g^2 are interposed between the arms g' and the ends of the slides C in order to hold the saddles in normal position. The cam strips H are secured by means of slotted arms h and set screws or the like h' to a disk or ring I which surrounds the main shaft at substantially the center of the machine and is fastened by means of an arm i and lug i^2 to the frame A.

The clamping jaws J are carried on sleeves j which are supported and slide on rods j^2 rigidly secured in bearings j^3 on the slides C. The rods j^2 are shouldered at j^4 to form bearings for springs j^5 which bear at their opposite ends with the intumed flanges of the sleeves j in order to hold said sleeves, together with the clamping jaws, in normally retracted position. Rigidly secured to each of the sleeves j is a cam piece j^6 which is adapted to engage with a projecting cam j^3 on the inner side of the ring F to urge said sleeve forward to bring the jaw J in proper position to coact with its corresponding saddle G.

When the can body X with the heads x are in position in the saddles as shown in Fig. 5, and the sleeve j with the jaw J have been moved forward in alinement with the corresponding saddle G, it is necessary to swing the jaw down to engage with the body and

head and to bring its locking end j^7 into engagement with the correspondingly notched end g^2 of the saddle. This is accomplished by means of shoes K, shown best in Fig. 4, which are adapted to engage with the upper rounded portions or projections of the jaws J. The shoes are provided with tongues k which engage with slideways in brackets k' mounted on the rings F, F'. Springs k^2 interposed between the ends of the tongues k , and the upper parts of the brackets k' provide for a yielding engagement between the shoes K and the jaws. The shoes are prevented from being disengaged from the brackets by means of rods k^3 provided with stops k^4 .

It is only necessary to hold the jaws J closed while the slides are being forced in to head the cans. The jaws are then thrown out by means of cams or suitably shaped strips L which are secured to the rings F, F' and engage with pins j^8 on the jaws J. When in the course of rotation these pins strike the cam strips L, the jaws J are swung out on their pivots as shown in Fig. 7 and the springs j^5 draw the jaws back to their normal position as shown in Fig. 5.

The saddles G being swung out by the cams H, and the jaws being drawn back, the headed cans are supported between the revolving spindles c^2 as indicated in Fig. 8, and the can is ready to be crimped. This is done by means of crimping wheels M which are revolvably mounted on adjustable arms m carried by short rods m' , having bearings in the disks B, B' and also in auxiliary disks M', M², mounted on the main shaft a on either side of the ring I. These shafts are turned at the proper time to bring the wheels in engagement with the can ends by means of crank arms m^2 rigidly secured to the inner ends of said shafts. These arms are provided with cam rollers m^3 which are adapted to engage with cam slots m^4 in the faces of stationary disks M³ rigidly secured to the ring I or integral therewith. The cam slots m^3 are so designed that the crimping wheels M will be thrown into engagement with the can heads immediately after the heads have been forced onto the bodies and the jaws released. The cans being rapidly rotated by means of the gearing heretofore described, the pressure of the crimping wheels will cause the heads to be crimped in the manner desired. As soon as this is accomplished the completed cans are discharged at the lower side of the machine, and to insure the proper discharge, a resilient finger N is secured to the lower side of the ring I and projects downwardly into the path of the rotating cans. The cam tracks F^2 are designed so that the rollers e will be thrown in toward the rings F, F', at the time when the cans are to be discharged in order to release said cans and to return the slides

to normal position to receive other bodies and heads.

Various modifications will readily suggest themselves as coming within the scope of this invention, more particularly in the means for operating the crimping device and the clamping jaws, and we do not wish to limit ourselves to the exact construction herein set forth, but

What we claim and desire to secure by Letters Patent is:

1. In a can-making machine, the combination of a revoluble wheel, slideways on said wheel, slides engaging with said slide-ways, inner can and can-head supporting members pivotally mounted on said slides and adapted to swing in to release the cans, outer can and can-head engaging jaws also pivotally mounted on said slides and adapted to coact with said supporting members, and means for reciprocating said slides to head the cans.

2. In a can-making machine, the combination of pairs of pivoted gripping jaws adapted to receive and support the can bodies and heads, means for reciprocating said jaws to force said heads onto the can bodies, reciprocating spindles provided with heads for engaging with the can heads, means for swinging each member of said pairs of gripping jaws to release the cans after the heads have been pressed upon the body, leaving the can support between the spindles, and means for revolving said spindles to give the can a rotary motion.

3. In a can heading machine, the combination of a revoluble gripping mechanism comprising a pivoted saddle pivoted transversely to the axis of revolution, means for swinging said saddle to free the can, and a gripping jaw adapted to coact with said saddle.

4. In a can heading machine, the combination of reciprocating gripping devices provided with pivoted saddles, gripping jaws adapted to coact with the said saddles, means for reciprocating said jaws relatively to said saddles, means for swinging said jaws to cause them to engage with and lock said saddles, means for releasing said jaws, means for swinging said saddles on their pivot to release the can and means for returning said saddles and jaws to normal position for receiving the can bodies and heads.

5. In a can making machine the combination of revoluble can supporting devices adapted to rotate around a central shaft, stationary cams, rock shafts adapted to rotate with said can supporting devices, cam arms engaging with said cam for rocking said shafts, adjustable arms on said shafts and crimping devices carried by said arms

and adapted to be thrown into engagement with said cans to crimp the same.

6. In a can making machine, the combination of a frame, a shaft mounted in said frame, can gripping and revolving devices carried by said shaft, stationary rings secured to said frame and surrounding said gripping devices, camways formed at the sides of said rings, means connected with said can gripping devices and adapted to be operated by said camways for heading the cans, can crimping devices carried by the main shaft, and means for operating said devices to bring them in contact with the rotating cans after the heading process is completed.

7. In a can making machine, the combination with gripping devices, of rotating spindles adapted to press against the can heads, gears on said spindles, a gear loosely mounted on the main shaft meshing with said spindle gears, and means for rotating said last named gear independently of the rotation of the main shaft.

8. A can gripping mechanism comprising pivoted jaws adapted to receive and hold the can body and head, a disk to engage with the head to press it upon the body, said jaws being pivoted to swing out to allow a crimping device to engage with the head after the can is headed.

9. The combination of a can gripping device, and means for reciprocating said device to cause it to press the can heads onto the bodies with yielding pressure.

10. In a can gripping device, the combination of a pair of gripping jaws, a spindle mounted with said jaws having one end adapted to engage with the recessed can heads, means for reciprocating said spindle and collars on said spindle adapted to engage with the bearings of a slide carrying said jaws and spindle, whereby said slide is moved after the spindle engages with the can head.

11. In a can gripping mechanism, the combination of a slide, a saddle pivoted transversely to said slide a gripping jaw pivoted longitudinally to said slide, and movable longitudinally to said slide, a spindle concentric with said saddle and jaw, an end on said spindle to engage with the can heads, bearings on said slide for said spindle, collars on said spindle to engage with said bearings to move the slide, a sleeve loosely mounted on said spindle, and means for moving said sleeve to reciprocate said spindle and slide.

EDVARD ELLEFSEN.
LOUIS LAMBIN.

Witnesses:

M. G. NOBLE,
M. C. SIKTBERG.