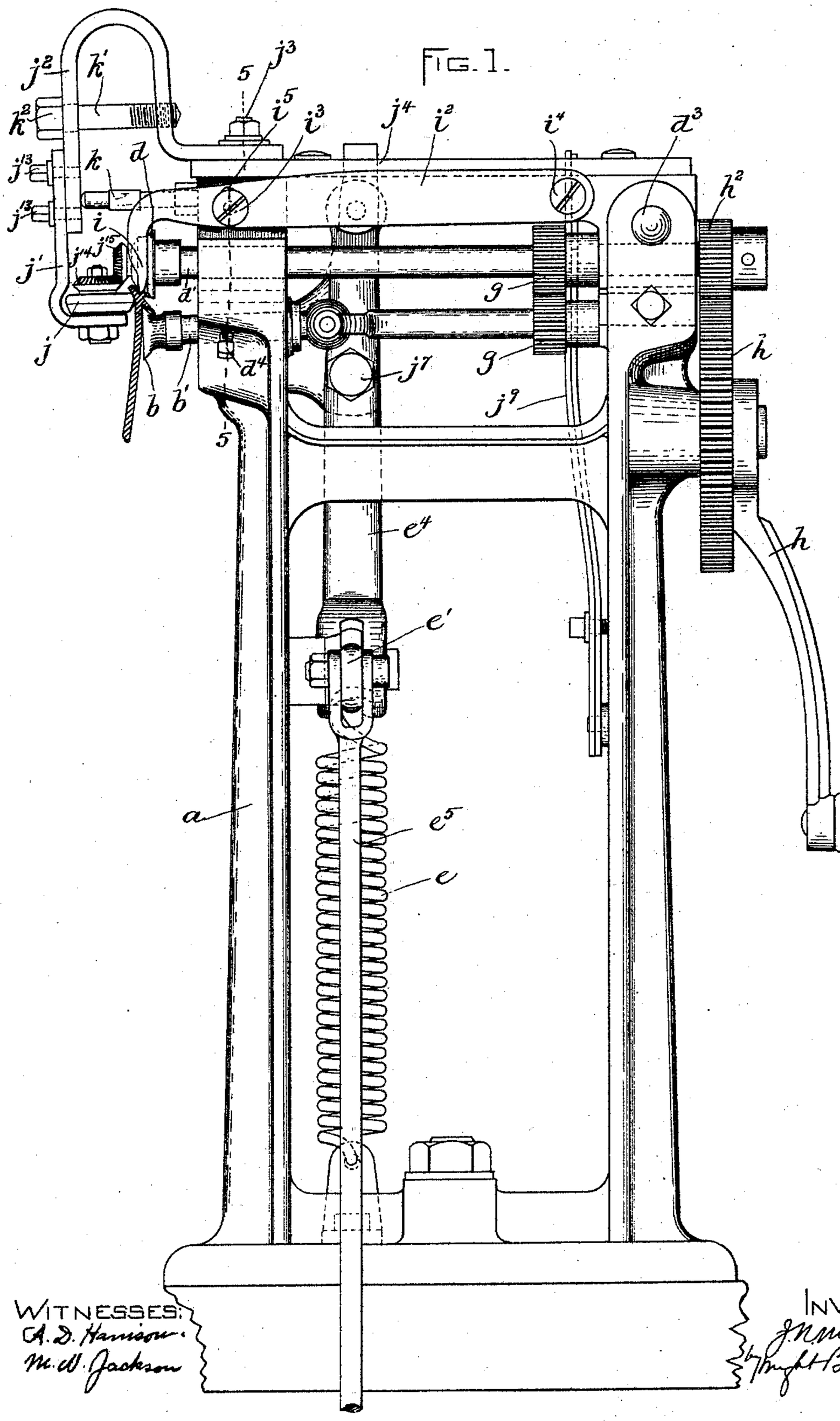
(No Model.) 3 Sheets—Sheet 1.

J. N. MOULTON.

CHANNEL MOLDING MACHINE.

No. 498,017. Patented May 23, 1893.

FIG. 1.



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(No Model.) 3 Sheets—Sheet 2.

J. N. MOULTON.

CHANNEL MOLDING MACHINE.

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FIG. 2.

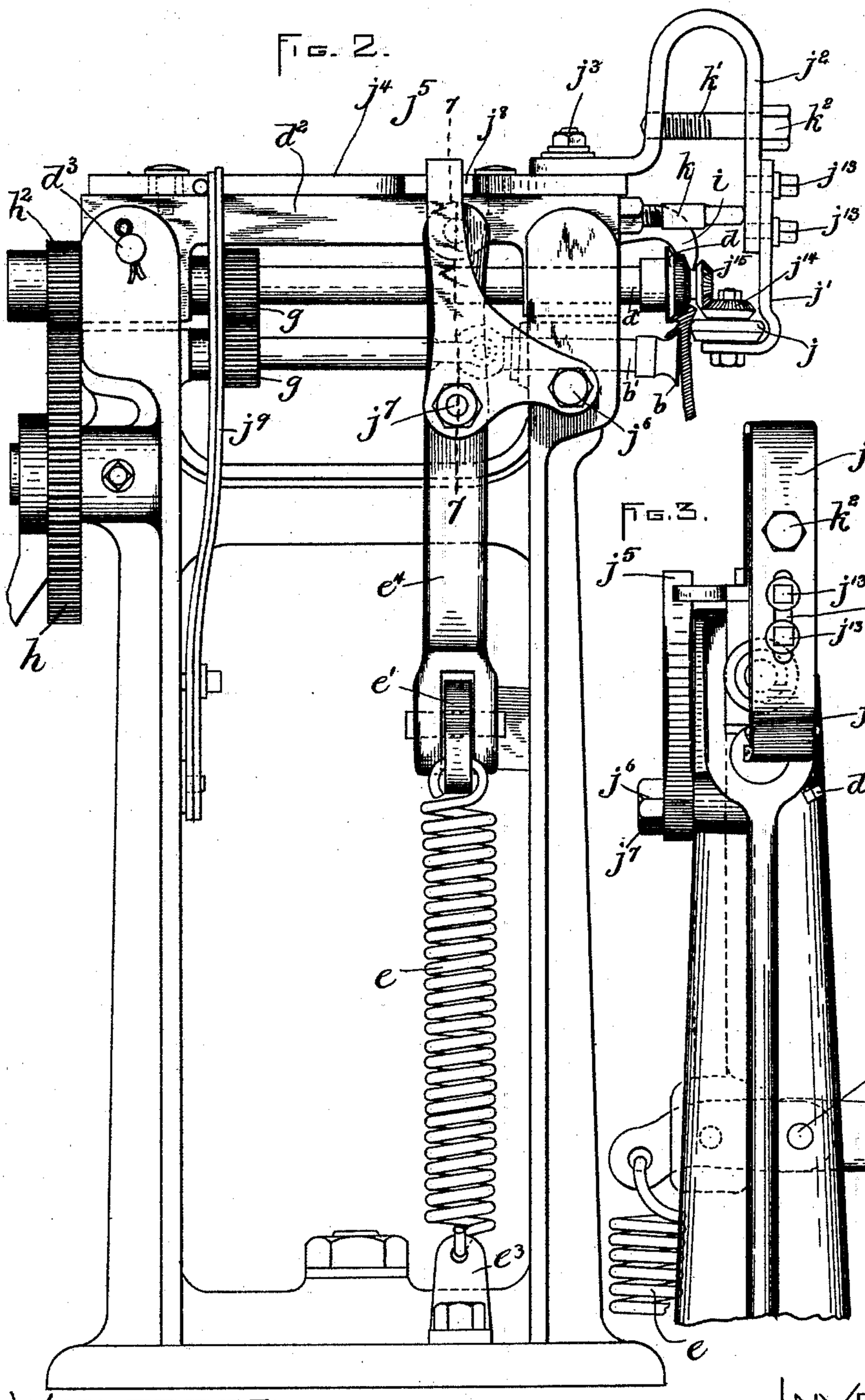

FIG. 3.

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(No Model.) 3 Sheets—Sheet 3.

J. N. MOULTON.

CHANNEL MOLDING MACHINE.

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FIG. 4.

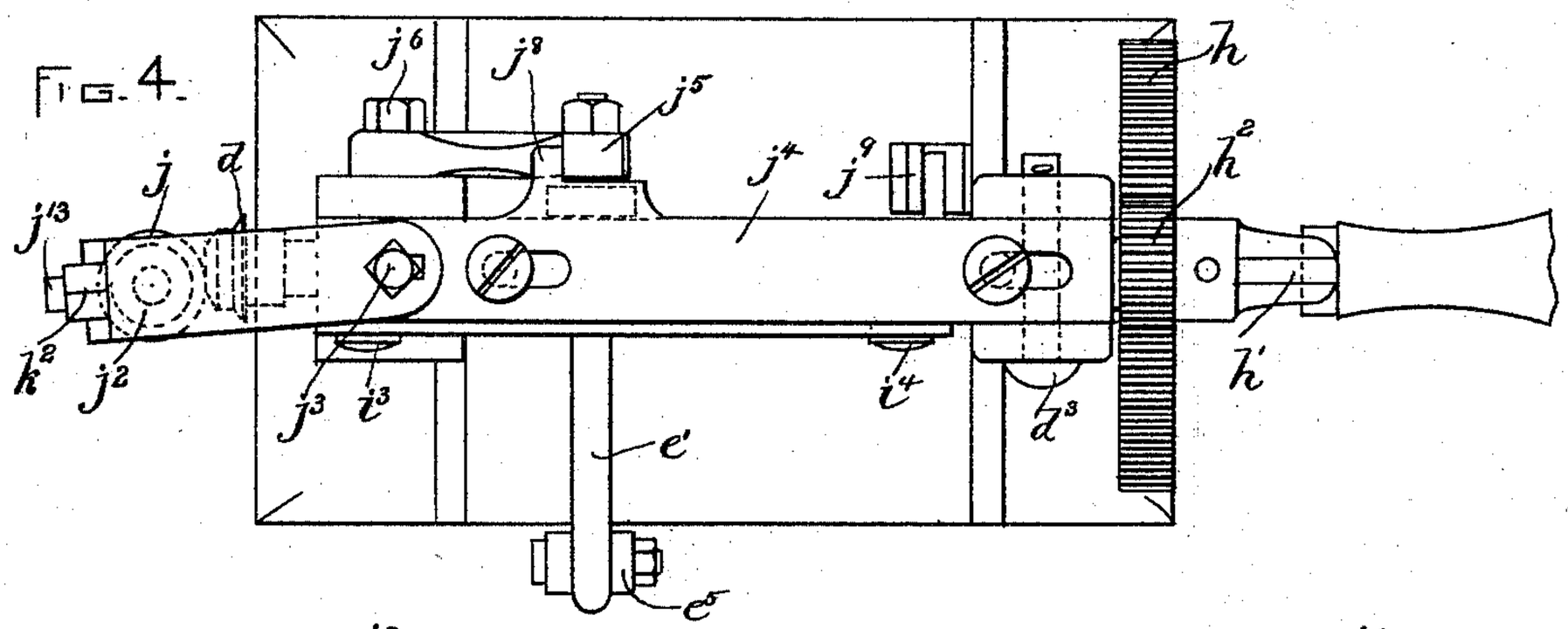


FIG. 5.

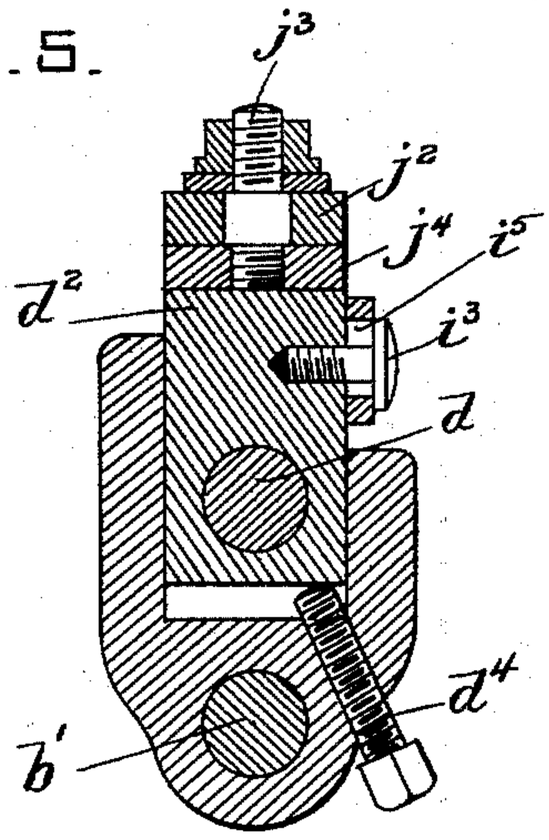


FIG. 6.

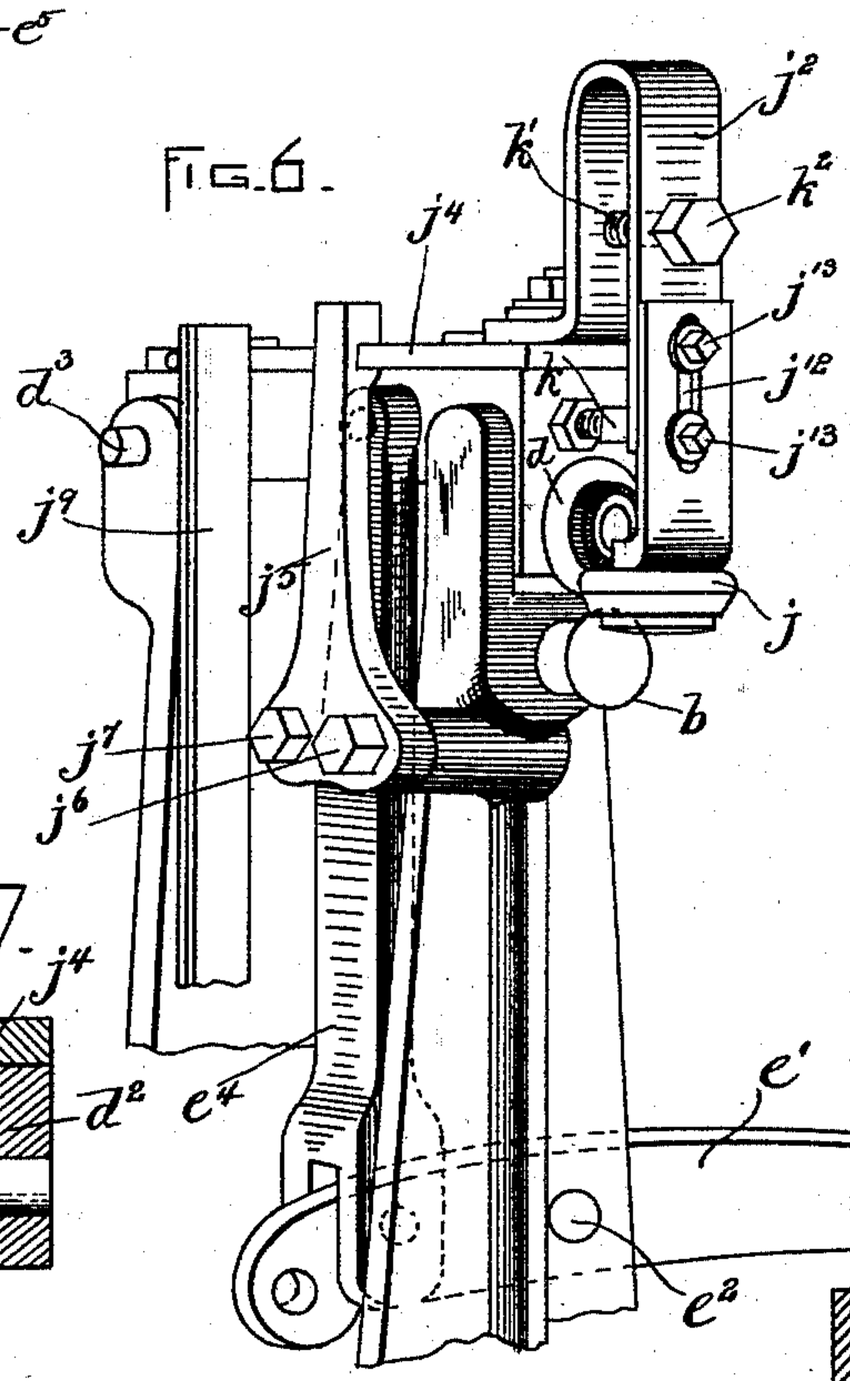


FIG. 7.

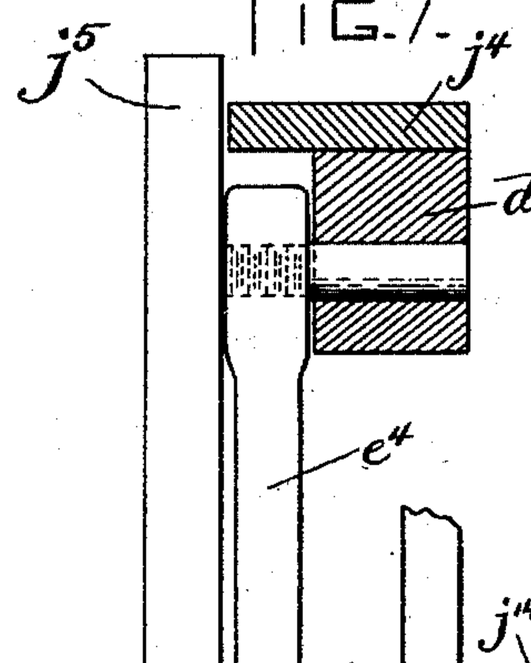


FIG. 10.

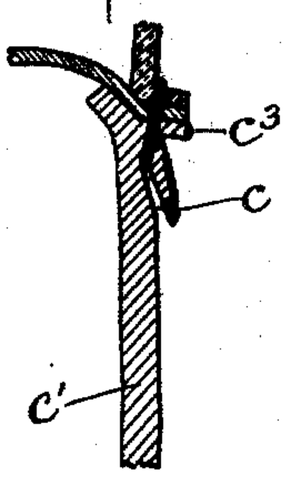


FIG. 8.

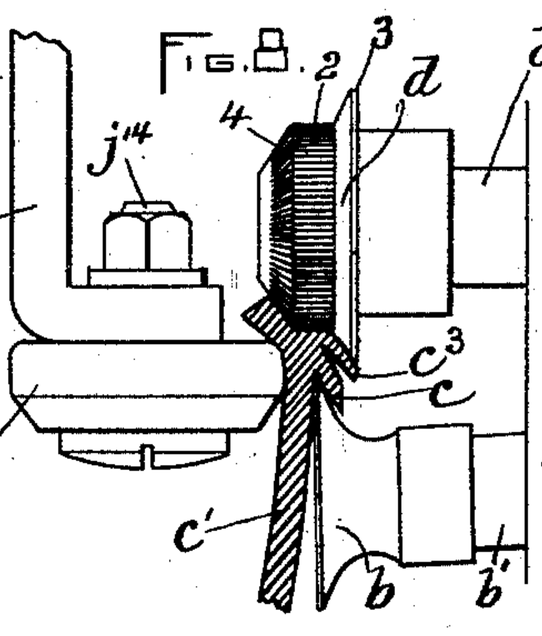
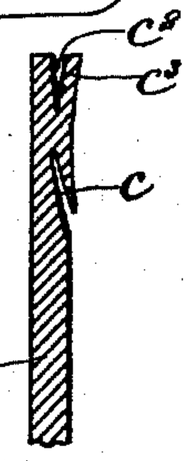


FIG. 9.



WITNESSES
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UNITED STATES PATENT OFFICE.

JAMES N. MOULTON, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO THE EPPLER WELT MACHINE COMPANY.

CHANNEL-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 498,017, dated May 23, 1893.

Application filed May 28, 1892. Serial No. 434,740. (No model.)

To all whom it may concern:

Be it known that I, JAMES N. MOULTON, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Channel-Molding Machines, of which the following is a specification.

This invention relates to machines for treating inner soles of boots and shoes, and particularly of boots and shoes in which the inner sole has a channel formed in its outer face to receive stitches that connect the inner sole, the upper and a welt, the edge of the sole being slit or channeled to permit a portion of the edge to be turned back and form a lip, to which the inner edge of the welt is attached. The material of the inner sole between the bottom of the channel in the face of the sole and the slit or channel in the edge of the sole is known as the between-substance, and the stitches that connect the welt, upper and inner sole pass through the between-substance, their inner portions being laid in the bottom of the channel in the face of the sole, and their outer portions on the outer surface of the welt.

My invention has for its object chiefly to provide a machine adapted to compress the between-substance, and thus clearly define the bottoms of the channel in the face of the sole, and the slit in the edge of the sole, reducing the thickness of the between-substance to the minimum, and enabling the stitches to have a firm bearing on the bottom of the channel and the upper to have a firm bearing on the bottom of the slit in the edge of the sole, without subjecting the thread which constitutes the stitches and the mechanism which forms the stitches to unnecessary strain in bringing said stitches and upper to a firm bearing on the bottoms of the channel and slit.

The invention consists, mainly, in the combination of a pair of rolls, one having a thin-edged periphery, adapted to enter the channel in the face of the sole, and the other having a cylindrical periphery to co-operate with the thin-edged roll in compacting or compressing the between-substance and a beveled flange to turn back the lip at one side of the slit in the edge of the sole.

The invention also consists in the combination with said rolls of certain auxiliary devices, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a front elevation of my improved channel-molding machine. Fig. 2 represents a rear elevation of the same. Fig. 3 represents a partial end elevation. Fig. 4 represents a top plan view. Fig. 5 represents a section on line 5—5, Fig. 1. Fig. 6 represents a perspective view of a portion of the machine. Fig. 7 represents a section on line 7—7, Fig. 2. Fig. 8 represents a front elevation of the channel-molding rolls. Fig. 9 represents a sectional view of a portion of the inner sole before it is subjected to the action of the machine. Fig. 10 represents a sectional view of a portion of a welted boot or shoe, the inner sole of which has been treated by my improved machine.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings: *a* represents the supporting-frame of the machine.

b represents the roll which enters the channel *c* (Fig. 9) in the face of an inner sole *c'*; and *d* represents the roll which turns back the lip c^3 at one side of the slit c^2 (Fig. 9) which is cut in the edge of the inner sole.

The roll *b* is formed with a thin-edged periphery, adapted to enter the channel *c* and bear closely upon the bottom thereof, as indicated in Fig. 8, said roll being affixed to a shaft *b'*, which is journaled in bearings in the supporting-frame.

The roll *d* has a substantially cylindrical periphery 2, which is preferably milled, and is provided at one end with a beveled flange 3, which is formed to bend back the lip c^3, the other end of the periphery 2 of the roll *d* at the same time bearing upon the bottom of the slit c^2, and co-operating with the roll *b* in compressing the between-substance. The roll *d* is also preferably provided with a frusto-conical portion 4, at the end of the periphery 2 opposite the flange 3, said portion being also milled, as shown in Fig. 8. I do not limit myself to the employment of the portion 4,

however, and may make the end of the roll *d* flat instead of frusto-conical. The roll *d* is affixed to a shaft *d'*, which is journaled in bearings in an arm or frame d^2, which is pivoted at d^3 to the supporting-frame, and is adapted to rise and fall, to permit the roll *d* to approach and recede from the lower roll *b*.

The upper roll *d* is pressed downwardly upon the material interposed between it and the lower roll *b* by means of a spring *e*, which is connected at one end with a lever *e'*, pivoted at e^2 (Figs. 3 and 6) to the supporting-frame, the other end of said spring being connected to a fixed ear e^3 on the supporting-frame. The lever *e'* is connected near one end by a rod e^4 with the frame d^2, and at its other end with a downwardly-extending rod e^5, the lower end of which may be connected with a treadle. The depression of said rod e^5 by the treadle will cause the lever *e'* to raise the rod e^4 and the frame d^2, thus raising the upper roll *d*, this being done when the work is to be inserted and removed. When the treadle is released, the spring *e*, acting through the lever *e'* and rod e^4, depresses the frame d^2 and upper roll *d*, causing the latter to bear with a yielding pressure upon the work. The extent of the downward movement of the frame d^2 and upper roll *d* may be determined by an adjustable stop or bearing, on which is preferably a screw d^4 (Figs. 1 and 5), arranged to act as a stop for the bearing of the swinging end of the frame d^2, and thus limit the downward movement of said frame.

The shafts *d'* and *b'* are connected by gears *g g*, which cause said shafts and rolls to rotate simultaneously in opposite directions. Motion may be imparted to said shafts by means of a gear *h*, affixed to a crank *h'*, adapted to be rotated by the operator, and a smaller gear or pinion h^2, meshing with the gear *h*, and affixed to the shaft *d'*.

i represents a finger or gage, which is arranged to enter the slit c^2 in advance of the roll *d*, and partially displace or turn over the lip c^3, so as to prepare the latter for the roll *d*. Said gage is formed on a shank-piece i^2, which is attached by screws i^3 i^4 to the frame d^2. The screw i^3 passes through a slot i^5 in said shank, said slot permitting the gage *i* to be adjusted vertically to a slight extent, as will be seen by reference to Fig. 1.

j represents a horizontally-arranged roll, which is located so that its periphery will bear upon the side of the sole opposite the side in which the channel *c* is formed, and at a point opposite the between-substance between the rolls *b* and *d*, as best shown in Figs. 1 and 8, the office of the roll *j* being to hold the channeled side of the sole closely against the roll *b* and prevent the sole from moving sidewise so as to disengage the channel from said roll.

The roll *j* may be supported in any suitable way. I have here shown as the support of said roll a shank *j'*, which is affixed to a U-shaped elastic arm j^2, one end of which is connected by a bolt j^3 to a horizontal plate j^4, adapted to slide lengthwise on the upper surface of the swinging frame d^2, said sliding plate j^4 being movable in the direction required to move the roll *j* horizontally toward and from the space between the rolls *b* and *d*. Means are provided whereby the operator may move the sliding plate j^4 in the direction required to move the roll *j* away from the rolls *b* and *d*, said means, as here shown, including the lever *e'*, the rod e^4 connecting said lever with the pivoted frame d^2, and a bell-crank lever j^5, pivoted at j^6 (Fig. 2) to the supporting-frame, and at j^7 to the connecting-rod e^4. One arm of said bell-crank lever bears against a lug or ear j^8 (Figs. 2 and 4) on the sliding plate j^4, the arrangement being such that, when the lever *e'* is depressed by the operator to raise the upper roll *d*, as above described, the bell-crank lever j^5 will be moved in such direction as to cause it to bear on the lug or ear j^8, and through said lug move the sliding plate j^4 and the roll *j* in the direction required to move the roll *j* away from the rolls *b* and *d*. It will be seen, therefore, that the act of the operator which separates the roll *d* from the roll *b*, also displaces the roll *j*. When the lever *e'* is released to permit the spring *e* to depress the upper roll *d*, the spring at the same time retracts the bell-crank lever j^5 and permits a spring j^9 to force the slide j^4 in the direction required to move the roll *j* toward the rolls *b* and *d*, thus causing the roll *j* to co-operate with the rolls *b* and *d*.

The roll *j* may be adjusted to the thickness of the sole by means of an adjusting screw or rod *k*, one end of which is screw-threaded and engaged with a socket in the swinging end of the frame d^2, its other end bearing against the inner side of the U-shaped arm j^2. When the rod *k* is turned to move it outwardly, it bears upon the U-shaped arm j^2 and forces the latter outwardly from its normal position, thus giving any desired lateral adjustment to the roll *j*. The arm j^2 may be adjusted by means of a screw *k'*, engaged by a screw-thread with one of the sides of the arm, and having a head k^2, bearing on the other side of the arm.

The shank *j'*, which directly supports the roll *j*, may be adjusted vertically by means of a slot j^{12}, formed in it, as shown in Fig. 6, and receiving the screws j^{13} j^{13}, which attach said shank to the arm j^2.

The roll *j* may be mounted to rotate loosely on a stud j^{14}, affixed to the shank *j'*, as shown in Fig. 8; or, if desired, said roll *j* may be positively rotated by means of gears j^{14} j^{15}, connecting it with the shaft *d'*, as shown in Figs. 1 and 2.

I do not limit myself in all cases to the employment of the roll *j*, as the work may be kept in proper relation to the rolls *d* and *b* by any other suitable means; or without the employment of any special device for this purpose, sufficient care being exercised by the operator. I prefer to use the roll *j*, however, because it furnishes an anti-friction bearing

for the outer surface of the sole, holding the latter in its operative relation to the channel-molding rolls and permitting the movement of the sole without friction or resistance.

I do not limit myself to the described details of mechanism here shown. The essential feature of my invention is the combination of the rolls *b* and *d*, the former adapted to enter the channel and the latter adapted to turn back the lip c^2 and to co-operate with the roll *b* in compressing the between-substance. Hence these features may be used with any other suitable means for making them operative, without departing from the spirit of my invention.

I claim—

1. In a sole-channel-molding machine the combination of two rollers arranged in juxtaposition, one having a thin-edged periphery formed to enter the channel, and the other a cylindrical periphery to co-operate with the thin-edged roll in compacting or compressing the between-substance, and a beveled flange to turn the lip at one side of the channel on an angle to the between-substance.

2. In a sole-channel-molding machine, the combination of the upper roller having a lip-turning flange and a pressing periphery, the lower roll having a thin-edged periphery, and the gage arranged to bend the edge lip at a point in advance of the pressing periphery of the upper roll, as set forth.

3. In a sole-channel-molding machine, the combination of the thin-edged lower roll journaled in fixed bearings, the upper roll having the edge-lip-bending flange and pressing periphery arranged opposite the thin-edged periphery of the lower roll, a swinging frame in which the shaft of the upper roll is journaled, the guide-roll arranged to hold the work against the lower roll, a horizontally movable holder supporting said guide-roll, a lever and connecting-rod for raising and depressing the swinging frame and the upper roll, and a lever connected with the fixed supporting-frame and with the connecting-rod, and engaged with the horizontally movable holder, whereby said holder and roll are displaced horizontally when the upper roll is displaced vertically, as set forth.

4. In a sole-channel-molding machine, the combination of a thin-edged lower roll journaled in fixed bearings, an upper roll having an edge-lip-bending flange and a cylindrical pressing periphery opposite the thin-edged periphery of the lower roll, a movable frame in which the shaft of the upper roll is journaled, a guide roll arranged to hold the work against the pressing rolls, a horizontally sliding plate supporting the said guide roll, a lever-and-rod connection for raising the movable frame supporting the upper roll, and a lever pivoted to the fixed frame of the machine, and jointed to the connecting rod, said lever having a projecting end which engages the sliding plate supporting the guide roll, whereby the said plate and roll are displaced horizontally when the upper roll is displaced vertically, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of April, A. D. 1892.

JAMES N. MOULTON.

Witnesses:
ANDREW EPPLER,
A. D. HARRISON.