No. 877,480. PATENTED JAN. 28, 1908.

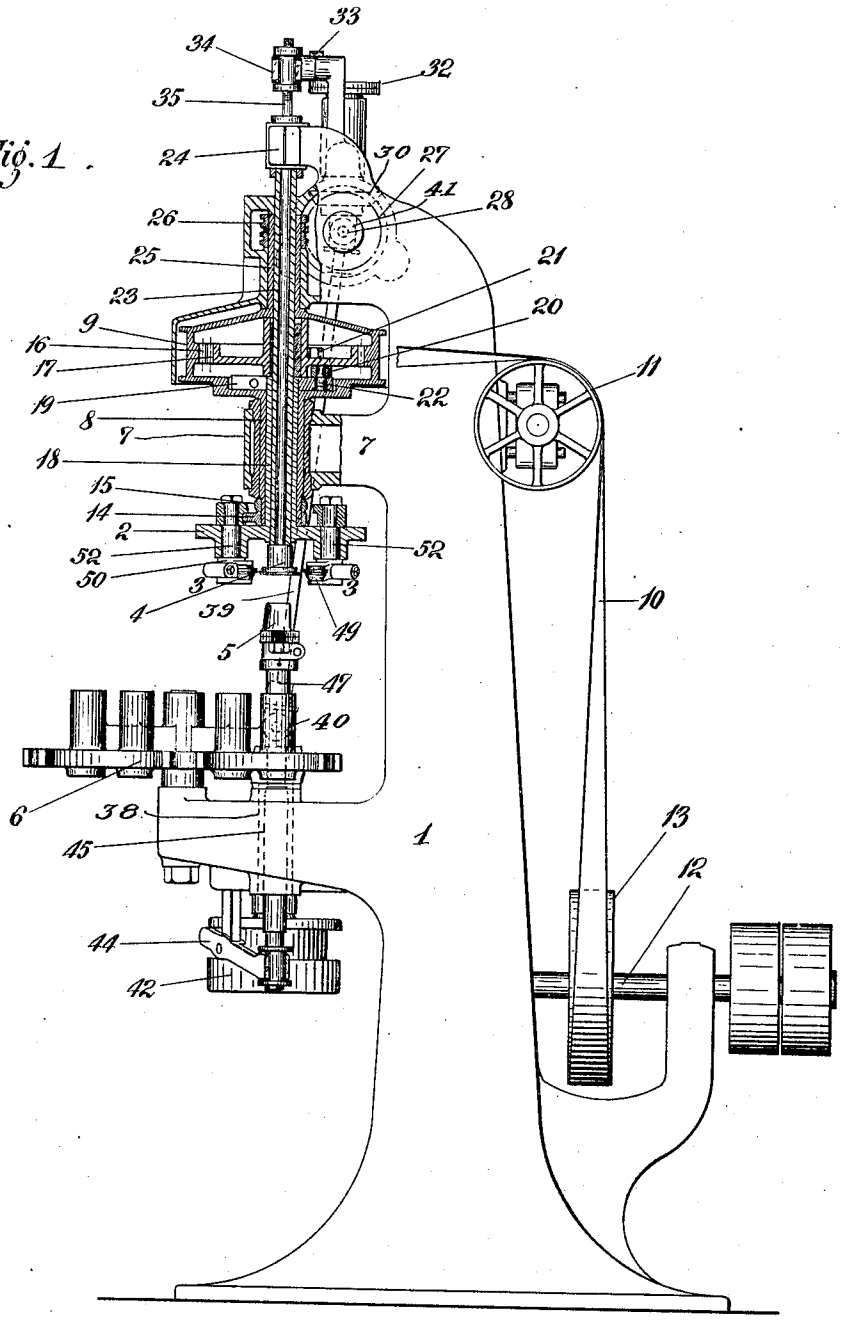
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SEAMING MACHINE.

APPLICATION FILED MAR. 24, 1905.

7 SHEETS—SHEET 1.

Fig. 1.



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No. 877,480. PATENTED JAN. 28, 1908.

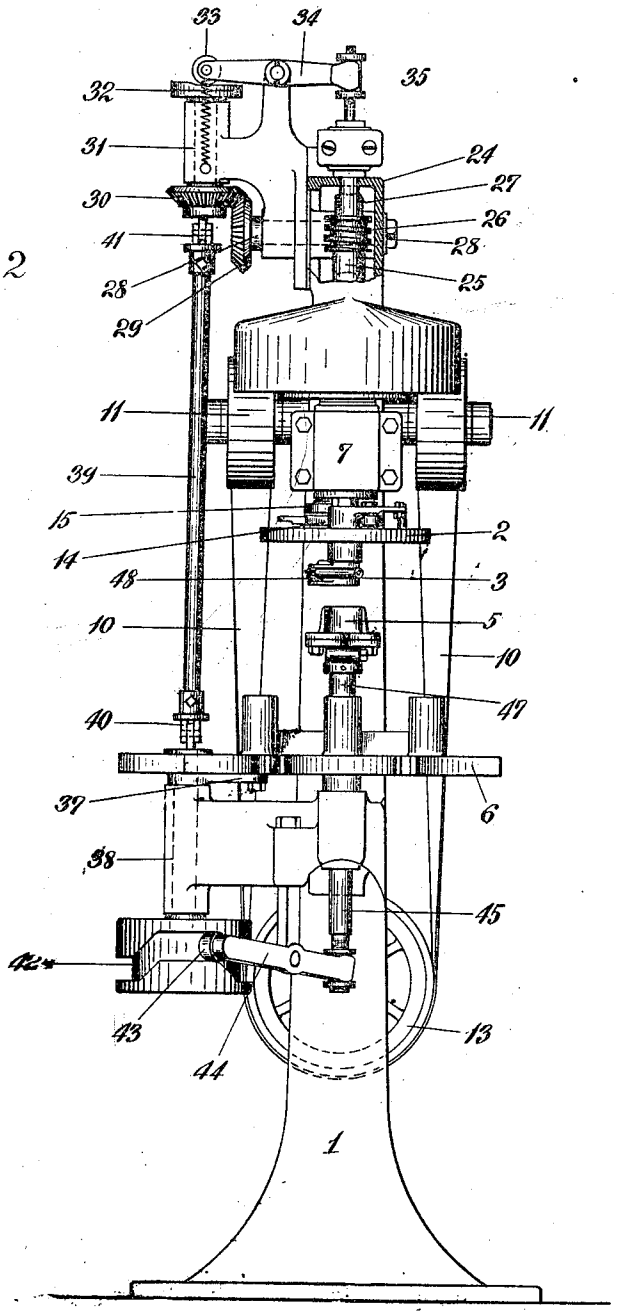
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7 SHEETS—SHEET 2.

Fig. 2



Witnesses

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No. 877,480. PATENTED JAN. 28, 1908.

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7 SHEETS—SHEET 3.

Fig. 3

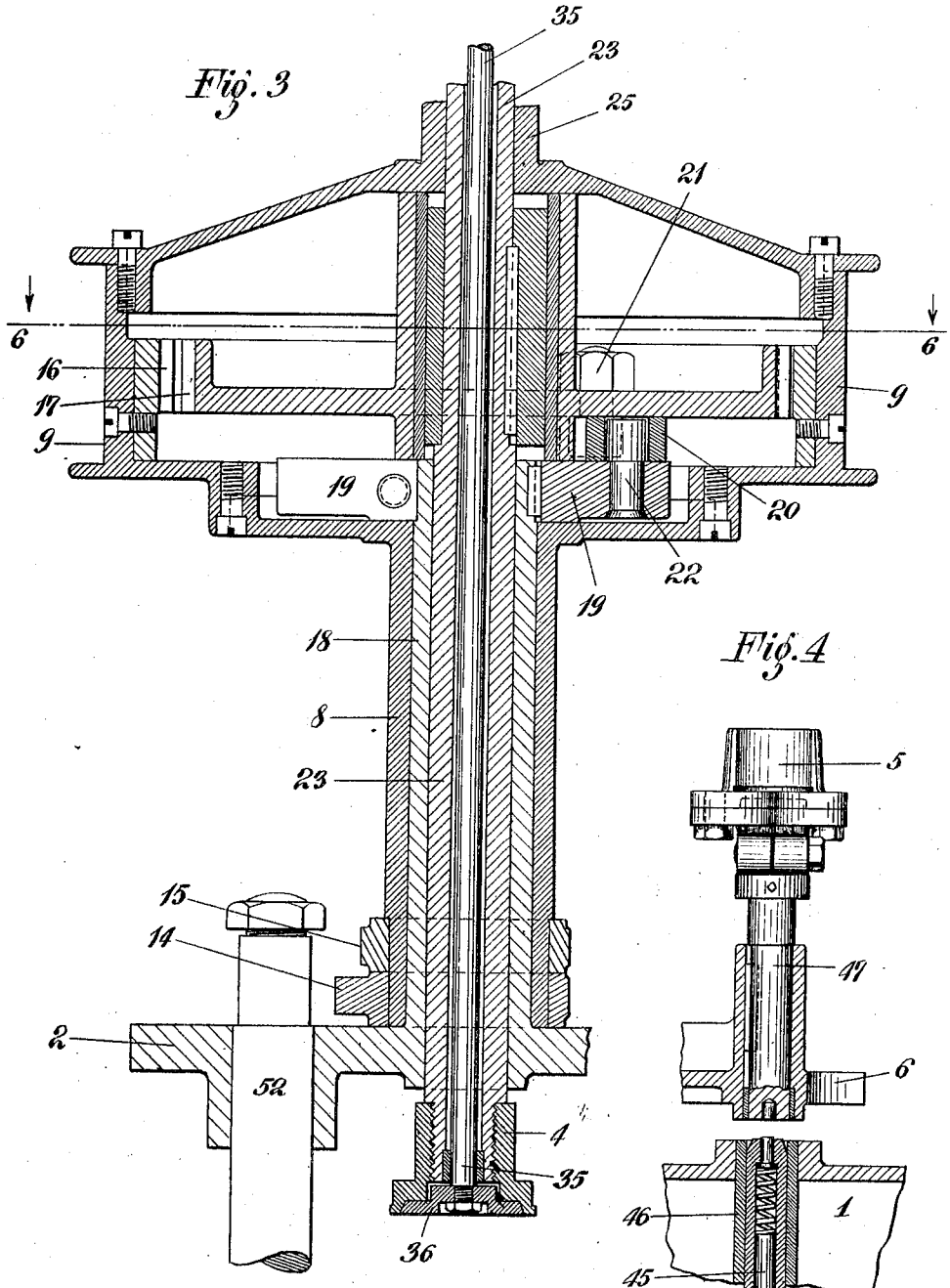


Fig. 4

Witnesses

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No. 877,480. PATENTED JAN. 28, 1908.

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7 SHEETS—SHEET 4.

Fig. 5

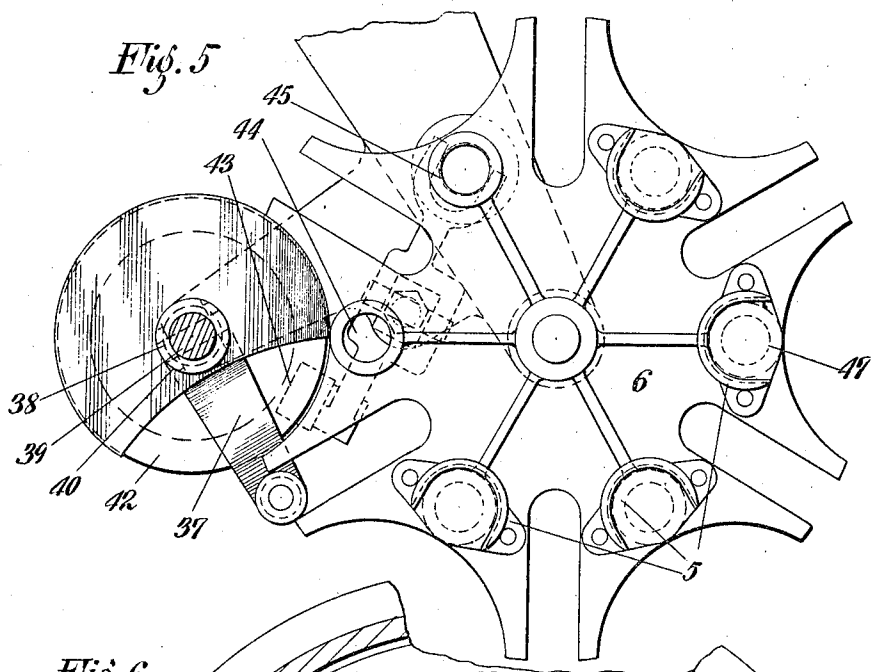
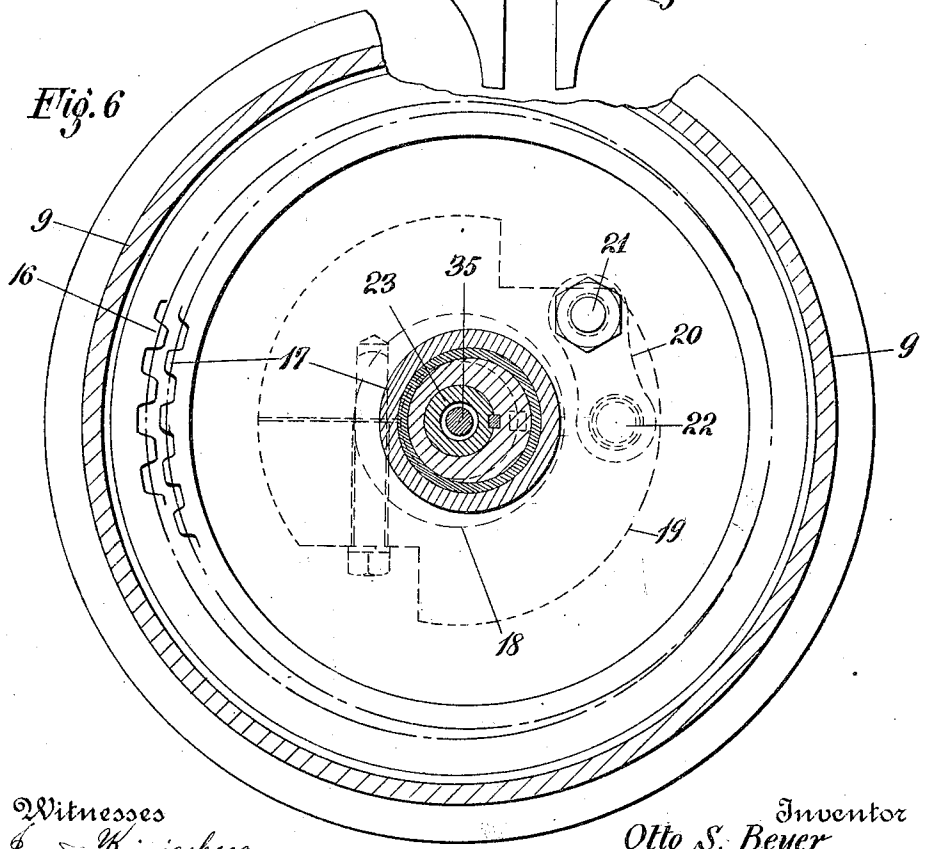


Fig. 6



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7 SHEETS—SHEET 5.

Fig. 7

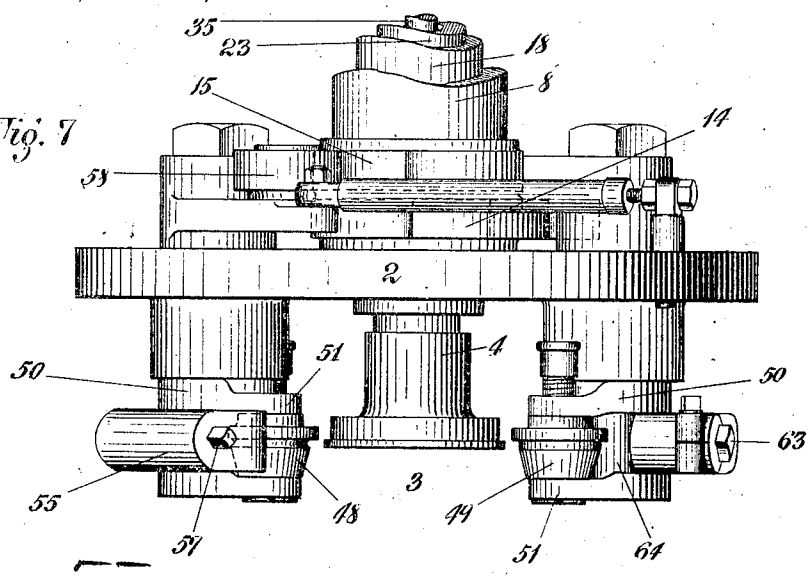
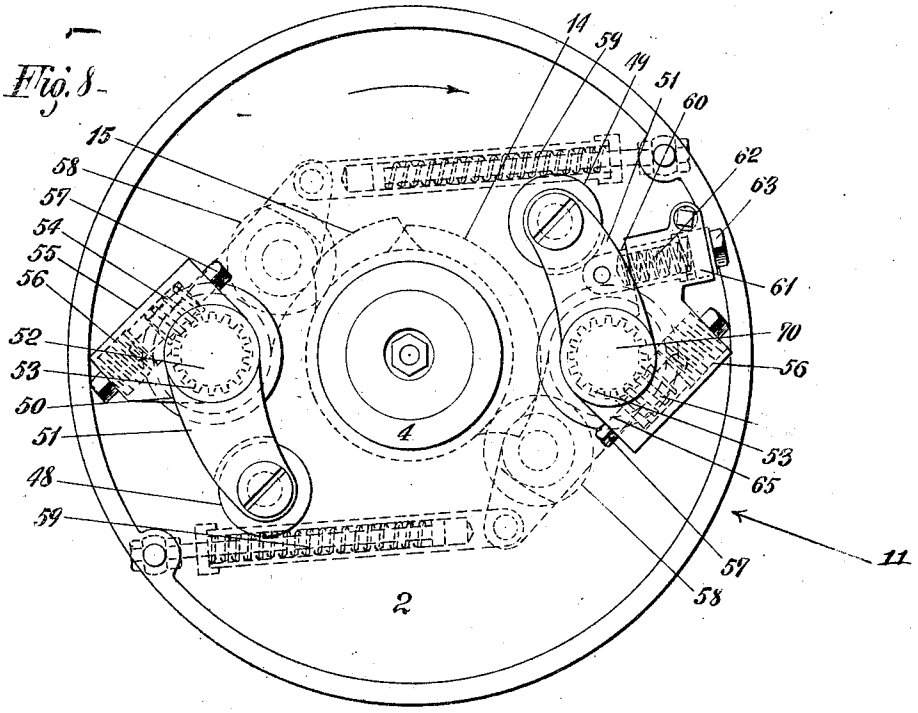


Fig. 8



Witnesses
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No. 877,480. PATENTED JAN. 28, 1908.

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APPLICATION FILED MAR. 24, 1905.

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Fig. 9

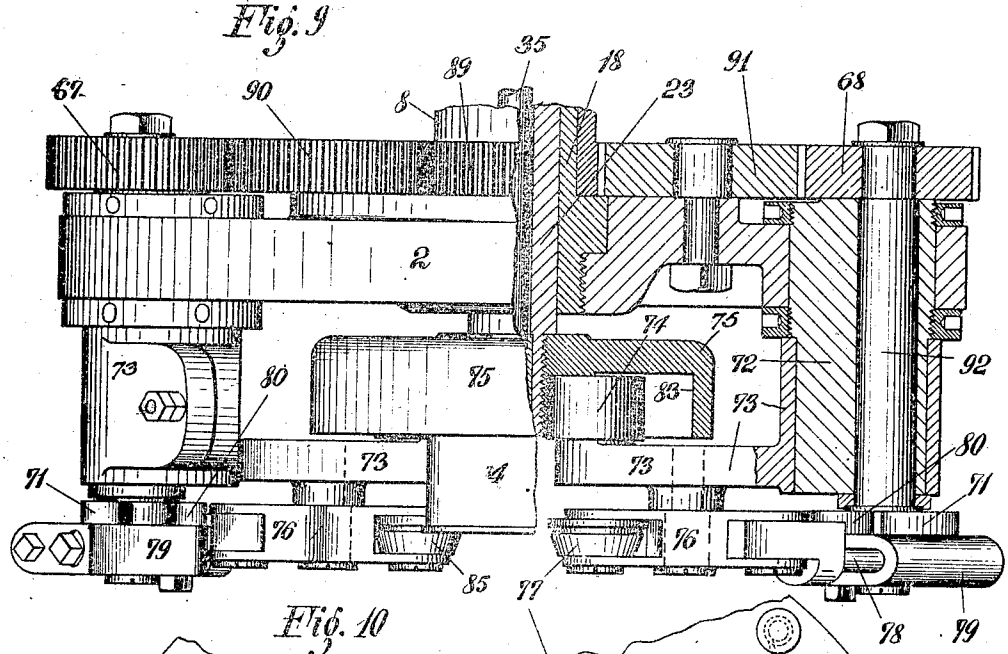
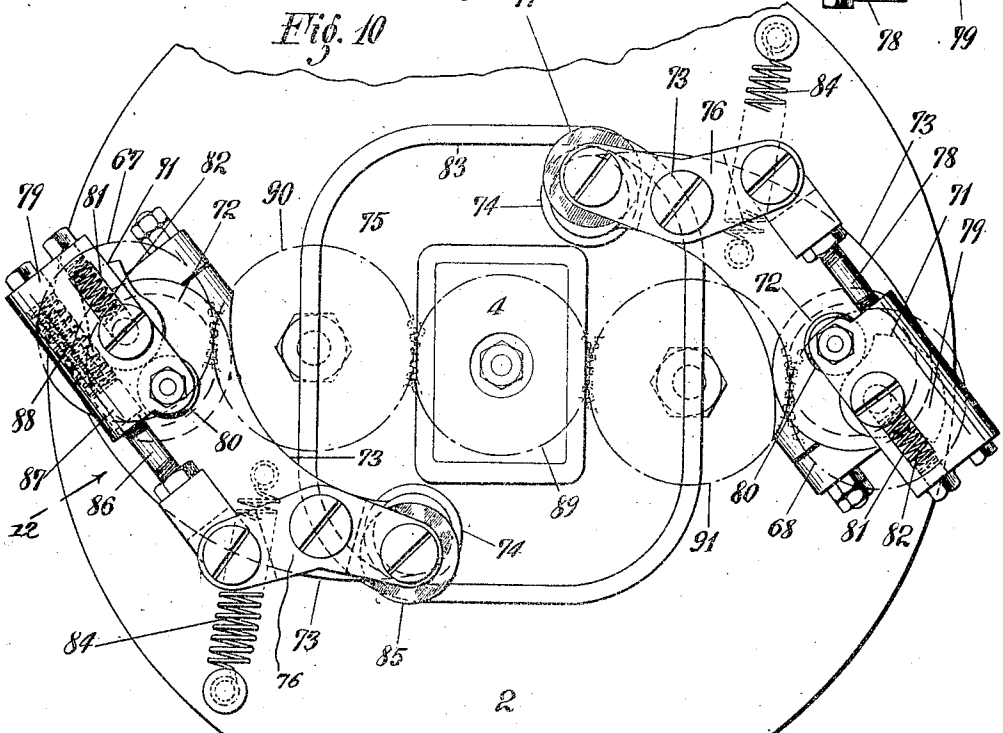


Fig. 10



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No. 877,480. PATENTED JAN. 28, 1908.

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SEAMING MACHINE.

APPLICATION FILED MAR. 24, 1905.

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Fig. 13.

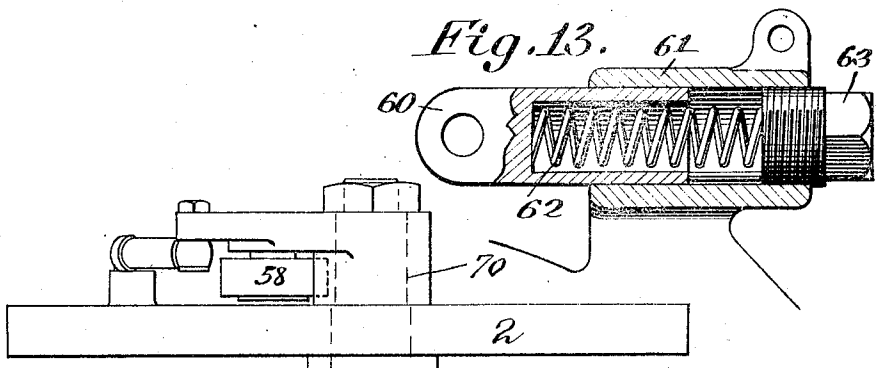


Fig. 11

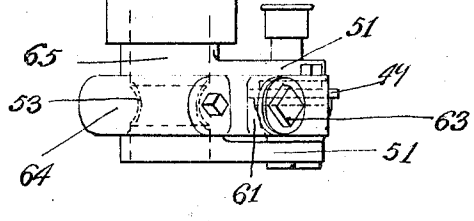
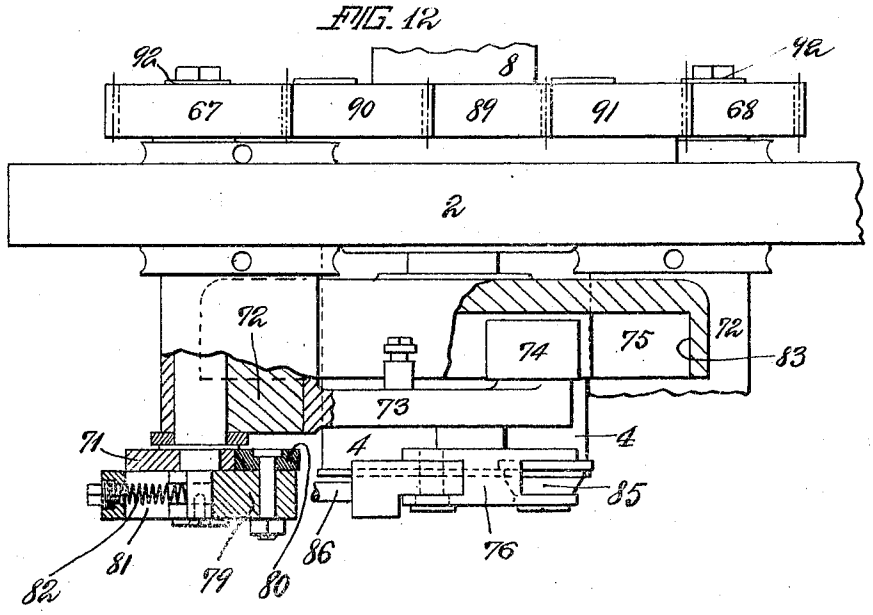


FIG. 12



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UNITED STATES PATENT OFFICE.

OTTO S. BEYER, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO E. W. BLISS COMPANY, A CORPORATION OF WEST VIRGINIA.

SEAMING-MACHINE.

No. 877,480. Specification of Letters Patent. Patented Jan. 28, 1908.

Application filed March 24, 1905. Serial No. 251,727.

To all whom it may concern:

Be it known that I, OTTO S. BEYER, a citizen of the United States of America, and a resident of East Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Seaming-Machines, of which the following is a specification.

The present invention relates generally to seaming machines for joining the ends or heads of cans to the bodies of the same, and has more particular reference to the driving mechanism for operating the parts.

The object of the invention is to simplify the parts as much as possible and to reduce the number of driving gears and members necessary to properly effect the operation of the machine.

In machines of this character, it should be understood, that the seamer head or disk carrying the seaming members and the chuck or clamp for the work have a rotary motion one with reference to the other, and further that the seaming members should be given a movement toward and away from the work or can during a certain period of the seaming operation. In the present instance, the seamer head is rotated while the chuck or clamp for holding the work stands still. This arrangement could of course be reversed.

The work to be acted upon will generally be round, though the invention is susceptible of being modified to act on square or irregular shaped cans, and a modification showing this is depicted in the drawings and described hereinafter.

Preferably the machine is automatic throughout, an automatic feed being provided and the machine being continuously running, although this does not necessarily form a part of the broad scope of the invention.

In carrying out the invention, the main improvement effected is in dispensing with the extra shaft and gears carried by the same which are generally used in machines of this character to impart a differential speed to the seamer head with relation to the seaming members. This is accomplished by mounting the transmission mechanism and driving means on a plurality of shafts, one within the other.

Another feature resides in the manner in which the Geneva stop and the means for lifting the work supporters as they successively come into alinement with the upper clamp or chuck are operated from the driving means, the especial feature used being a shaft having universal joints. By this means the number of gears are also reduced and less care is necessary in centering the Geneva stop with relation to the driving means. The seaming members in themselves also embody new and useful improvements, relating especially to the adjustment of the seaming rolls to suit the different sizes of cans to be acted upon.

Other features of construction and combinations of parts will appear as the specification proceeds.

In the accompanying drawings these several improvements have been embodied in a suitable construction. It is obvious, however, that the particular means used to effect the various improvements may be varied without departing from the true nature and scope of the invention.

In the said drawings: Figure 1 is a side elevation of a machine embodying my invention, shown partly in section. Fig. 2 is a front elevation of a machine with a part of the framework broken away. Fig. 3 is an enlarged view in section of the main driving means with connections and transmission mechanism for imparting motion to the seamer head and to the seaming members. Fig. 4 is a detail view partly in section of one of the work supporters and the means for raising the same. Fig. 5 is a plan view of the dial carrying the work supporters and showing also the Geneva stop for imparting motion to the same. Fig. 6 is a transverse sectional view on line 6—6 of Fig. 3. Fig. 7 is an enlarged view of the seamer head showing the seaming members in elevation. Fig. 8 is a bottom plan view of the seamer head showing also the seaming members. Fig. 9 is an enlarged detail view, partly in elevation and partly in section, showing a modification of the seaming members and illustrating the means used when it is desired to act on an irregular shaped or square can. Fig. 10 is a bottom plan view of Fig. 9. Fig. 11 is a detail view looking in the direction of the arrow 11 of Fig. 8. Fig. 12 is a detail view, partly

in section, looking in the direction of the arrow 12 of Fig. 10. Fig. 13 is a sectional detail view of parts shown in Fig. 8.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates a framework of any suitable construction for properly supporting the parts.

2 is the seamer head and 3 the seaming members.

4 is the chuck or clamp.

5 indicates a plurality of work supporters mounted on the rotatable dial 6 in a well known manner. The framework carries a bracket 7 supporting a hollow shaft 8 provided with suitable driving means such as the hollow pulley 9 to which motion is imparted by means of the belt 10 passing over the idlers 11 and receiving its motion from the shaft 12 carrying the pulley 13. The shaft 8 is provided with suitable means, in the present instance the cams 14 and 15, for causing the seaming members to move in and out in the usual manner. Mounted on the hollow pulley 9 is a concentrically disposed internal gear 16 with which meshes the eccentrically disposed external gear 17.

18 is a shaft located inside of the shaft 8 and carrying the seamer head 2. Mounted on this shaft 18 is a concentric member 19 in the present instance in the form of a disk, and means are provided whereby this disk or member 19 is driven from the eccentrically disposed external gear 17 preferably taking the form of a link 20 attached to the gear 17 and member 19 by means of the bolts or studs 21 and 22. Located inside the shaft 18 is a spindle 23 carrying the chuck or clamp 4, the said spindle being supported in the bracket 24 of the framework.

Moving with the pulley 9 is an upwardly extending hollow shaft 25 carrying the worm 26 meshing with the worm gear 27 mounted on the shaft 28 extending at right angles to the said shaft 25 and having at its outer end the bevel gear 29 meshing with another bevel gear 30 mounted on the stud or shaft 31 carrying the cam 32 with which the roller 33 of the pivoted lever 34 engages. This pivoted lever engages at its other end the stem 35 which extends down through the spindle 23 and has attached at its lower end the ejector 36.

The rotatable dial 6 which carries the work supporters in the usual way is operated by means of a Geneva stop 37 mounted on the shaft 38 which receives its motion from the shaft 31 by means of the rod 39 having universal joints 40 and 41. At the lower end of the shaft 38 is mounted a cam 42 with which engages the roller 43 mounted on the pivoted arm 44 whose other end engages the rod 45 sliding in the bushing 46 and engaging successively with the stems 47 of the work supporters as they come in alinement with the same.

As previously indicated, the seamer head 2 carries the seaming members 3. These seaming members in the present instance consist of the curling roll 48 and the finishing roll 49. The curling roll 48 is carried by a bushing 50 having the bifurcated arm 51. The spindle 52 has teeth 53 cut in said spindle with which engage a worm 54 carried by the socket 55 on the bushing 50. This socket 55 is provided with a screw 56 at one end which serves to tighten the worm 54 in position. On the end opposite to that of the screw 56, there projects outside the socket 55 a portion of the spindle 57 on which the worm is mounted.

It will be understood that by this means the said bushing 50 and the roll 48 are locked to the spindle 52 so as to move with the same. When it is desired, however, to adjust the position of the said roll 48 so as to correspond with different sizes of cans, the screw 56 is loosened and the portion 57 of the spindle carrying the worm 54 is turned thereby adjusting the position of the roll 48 with reference to the work to be acted upon. When the desired adjustment has been obtained, the screw 56 is tightened whereby the roll 48 and bushing 50 are held locked to the said spindle 52. The said spindle 52 is turned or given a motion so as to cause the roll 48 to move toward and away from the work by any suitable means such as the roller 58 fast on the said spindle 52 and adapted to engage with the cam 14 on the shaft 8, and held up against the same by some suitable means as the spring 59. The finishing roll 49 is constructed in substantially the same way and is operated from the cam 15, but is, in addition to the foregoing elements, provided with a yielding member which takes the form of a spring seated arm 60 attached with one end to the bifurcated arm 51 and extending with its other end into the sleeve 61 carried by the socket 64 which in this instance is mounted on the spindle 70 independently of the bushing 65. The sleeve 61 is provided with a spring 62 which presses against the said member 60 and against the bolt 63 closing the end of the sleeve 61. This spring seated member is for the purpose of compensating for the unevenness of the can due to the longitudinal seam of the body of the same so that when the finishing roll presses the flange or seam home, it is enabled to recede a slight distance when passing over the longitudinal seam of the body.

As the pulley or other driving means rotates, the motion will be transmitted through the upper hollow shaft 25 and connections to the shaft 28 and thence to the bevel gear 30. Through the instrumentality of the rod 39 having universal joints, the shaft 38 will be

rotated, thereby causing the disk 6 carrying the work supporters to be intermittently turned in a well known manner thereby successively causing the various work supporters to move into alinement with the chuck or clamp 4 and the work to be held between the said clamp and work supporter. The rotation of the pulley 9 further causes the rotation of the hollow shaft 8 and by this means the rotation of the cams 14 and 15 acting respectively on the curling and finishing rolls to move the same successively toward and away from the work. Owing to the fact that the gear 17 is in mesh with the gear 16, motion is further imparted to the shaft 18 and from thence to the seamer head 2.

The arrangement of the parts is such, however, that the seamer head makes about thirty revolutions to each twenty-nine revolutions of the cams 14 and 15 whereby the seaming operation will be effected properly. It will of course be understood that if the cams 14 and 15 on the seamer head are rotated at the same speed as the seamer head, no effect would be produced inasmuch as the said seaming members travel around with the said seamer head. The difference in speed between the seamer head and the cams 14 and 15 noted here need not of course be followed exactly, but care must be taken that the ratio is such that the seaming members will act once to each complete cycle of the machine. When the seaming operation is finished, the ejector 36 will operate automatically in a well known manner to prevent the finished can from clinging to the chuck or clamp.

In Figs. 9 and 10 there is shown a structure whereby the same general structure may be used for the seaming of square or irregular shaped cans. In this instance the shaft 8 is provided with a pinion 89 meshing with two idlers 90 and 91 which, in turn, engage the pinions 67 and 68 mounted fast on the spindles 92. At the lower end of one of the spindles 92 there is mounted a cam 71. Surrounding the spindle 92 is an eccentric bushing 72 on which is mounted the arm 73 carrying the roller 74 running in the stationary cam 75 mounted on the chuck 4. Pivoted on this arm 73 is a bell crank 76 carrying the roll, in this instance the curling roll, 77 at one end and connected at its other end to the rod 78 adjustably attached to the sliding block 79 carrying the roller 80 engaging with the cam 71 and provided with a slot 81 into which the end of the spindle 92 extends and normally tending to hold the roller 77 away from the work by reason of the spring 82 located in said slot 81. It will be noted that the roller 74 engaging with the cam 75 is mounted eccentrically with relation to the spindle 92. By this means a more steady and even motion is effected and less jarring of the parts takes place. The roller 74 is held up tight against the outer wall 83 of the cam 75 by means of the spring 84. The construction of the finishing roll 85 and the parts carrying the same is substantially identical with the construction of the roll 77 except that in this instance the rod 86 connecting with the bell crank supporting the finishing roll is provided with a yielding connection with the sliding block operated by the cam on the lower end of the spindle 92. In this instance the rod 86 is provided with a plunger 87 acting against the spring 88. This construction is to allow the finishing roll to recede while passing over the side seam of the body of the can.

What is claimed is:

1. In a seaming machine, the combination of a driving means, an upper and a lower hollow shaft moving with the same, an inner shaft located within the lower hollow shaft, differential transmission mechanism for driving the inner shaft from the driving means on the outer shaft, a shaft at right angles to the upper hollow shaft, and means for driving the said shaft at right angles to the upper hollow shaft from the latter.

2. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, and differential transmission mechanism between the two shafts.

3. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a second shaft located within the first shaft for driving the seamer head, and differential transmission mechanism between the two shafts.

4. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, a second shaft located within the first shaft to effect the relative motion between the seamer head and the chuck, an eccentrically disposed external gear meshing with the internal gear, a concentric member on the inner shaft, and means for driving the said concentric member from the eccentrically disposed gear.

5. In a seaming machine, the combination

with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for imparting motion to the seamer head, a concentric member on the inner shaft, and means for driving the concentric member from the eccentrically disposed gear.

6. In a seaming machine, the combination of a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley carried by said hollow shaft, an internal gear mounted on said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, a concentric member on the second shaft, and means for imparting the motion of the eccentric gear to the concentric member.

7. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley moving with said shaft, an internal gear moving with said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft within the first shaft for driving the seamer head, and means for imparting the motion of the eccentrically disposed gear to the concentric member on the second shaft.

8. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members on the head, of a plurality of shafts located one within the other, means for driving the outer shaft, differential transmission mechanism between the same for causing the seaming members to move toward and away from the work and for effecting the relative motion between the seamer head and chuck, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

9. In a seaming machine, the combination with a rotating seamer head, a stationary chuck and seaming members on the head, of a plurality of shafts located one within the other, means for driving the outer shaft, differential transmission mechanism between the same for causing the seaming members to move toward and away from the work and for rotating the seamer head, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

10. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, differential transmission mechanism between the two shafts, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the slraft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

11. In a seaming machine, the combination with a rotating seamer head, and a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a second shaft located within the first shaft, for driving the seamer head, differential transmission mechanism between the two shafts, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at

the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

12. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, a second shaft located within the first shaft to effect the relative motion between the seamer head and the chuck, an eccentrically disposed external gear meshing with the internal gear, a concentric member on the inner shaft, means for driving the said concentric member from the eccentrically disposed gear, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

13. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for imparting motion to the seamer head, a concentric member on the inner shaft, means for driving the concentric member from the eccentrically disposed gear, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

14. In a seaming machine, the combination of a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley carried by said hollow shaft, an internal gear mounted on said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, a concentric member on the second shaft, means for imparting the motion of the eccentric gear to the concentric member, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

15. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley moving with said shaft, an internal gear moving with said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft within the first shaft for driving the seamer head, means for imparting the motion of the eccentrically disposed gear to the concentric member on the second shaft, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, and means for operating the same, driven from the lower vertical shaft.

16. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members on the head, of a plurality of shafts located one within the other, means for driving the outer shaft, differential transmission mechanism between the same for causing the seaming members to move toward and away from the work and for effecting the relative motion between the seamer head and chuck, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the

motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

17. In a seaming machine, the combination with a rotating seamer head, a stationary chuck and seaming members on the head, of a plurality of shafts located one within the other, means for driving the outer shaft, differential transmission mechanism between the same for causing the seaming members to move toward and away from the work and for rotating the seamer head, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

18. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, differential transmission mechanism between the two shafts, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

19. In a seaming machine, the combination with a rotating seamer head, and a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, a second shaft located within the first shaft, for driving the seamer head, differential transmission mechanism between the two shafts, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

20. In a seaming machine, the combination with a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, a second shaft located within the first shaft to effect the relative motion between the seamer head and the chuck, an eccentrically disposed external gear meshing with the internal gear, a concentric member on the inner shaft, means for driving the said concentric member from the eccentrically disposed gear, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

21. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, means for driving said shaft, an internal gear moving with said shaft, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for imparting motion to the seamer head, a concentric member on the inner shaft, means for driving the concentric member from the eccentrically disposed gear, a

shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

22. In a seaming machine, the combination of a seamer head and a chuck, one of which has a rotary motion with relation to the other, and seaming members mounted on the seamer head, of a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley carried by said hollow shaft, an internal gear mounted on said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft located within the first shaft for effecting the relative motion between the seamer head and chuck, a concentric member on the second shaft, means for imparting the motion of the eccentric gear to the concentric member, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

23. In a seaming machine, the combination with a rotating seamer head, a stationary chuck, and seaming members mounted on the seamer head, a hollow shaft having means for causing the seaming members to move toward and away from the work, a hollow pulley moving with said shaft, an internal gear moving with said hollow pulley, an eccentrically disposed external gear meshing with said internal gear, a second shaft within the first shaft for driving the seamer head, means for imparting the motion of the eccentrically disposed gear to the concentric member on the second shaft, a shaft located at right angles to the first shaft and at the upper end of the same, means for imparting the motion from the said first shaft to the shaft located at right angles thereto, a shaft parallel to the first shaft and driven from the shaft disposed at right angles thereto, a vertical shaft at the lower end of the machine, a rod having universal joints connecting the shaft parallel to the first shaft with the said lower vertical shaft, a plurality of work supporters, means for operating the same, driven from the lower vertical shaft, an ejector, and means for operating the ejector from the shaft parallel to the upper vertical shaft.

24. In a seaming machine, the combination with a spindle having teeth on its surface, a bushing mounted on said spindle having means for supporting the seamer roll, a socket on the bushing, a rotatable worm located in said socket in mesh with the teeth on the spindle, and means for tightening the worm in position.

25. In a seaming machine, the combination with a spindle having teeth on its surface, of a bushing having means for supporting the seamer roll mounted on said spindle, a socket mounted independently of the bushing on said spindle, a rotatable worm located in said socket in mesh with the teeth on the spindle, means for tightening the worm in position, and a yielding connection between the means for supporting the seamer roll and the socket.

26. In a seaming machine, the combination with a spindle, of an eccentric bushing mounted on said spindle, an arm mounted loosely on said eccentric bushing and having a roll, a cam located extraneously of the spindle for engaging with said roll, a bell crank pivoted on the arm mounted on the eccentric bushing and carrying the seamer roll, a sliding member mounted on the spindle and provided with a roll, a cam mounted on the spindle for engaging with the said roll, and means connecting the sliding member and the bell crank.

27. In a seaming machine, the combination with a spindle, of an eccentric bushing mounted on said spindle, an arm mounted loosely on said eccentric bushing and having a roll, a cam located extraneously of the spindle for engaging with said roll, a bell crank pivoted on the arm mounted on the eccentric bushing and carrying the seamer roll, a sliding member mounted on the spindle and provided with a roll, a cam mounted on the spindle for engaging with the said roll, and adjustable means connecting the sliding member and the bell crank.

28. In a seaming machine, the combination with a spindle, of an eccentric bushing mounted on said spindle, an arm mounted loosely on said eccentric bushing and having a roll, a cam located extraneously of the spindle for engaging with said roll, a bell crank pivoted on the arm mounted on the eccentric bushing and carrying the seamer roll, a sliding member mounted on the spindle and provided with a roll, a cam mounted on the spindle for engaging with the said roll,

and a yielding member connecting the sliding member and the bell crank.

29. In a seaming machine, the combination with a spindle, of an eccentric bushing mounted on said spindle, an arm mounted loosely on said eccentric bushing and having a roll, a cam located extraneously of the spindle for engaging with said roll, a bell crank pivoted on the arm mounted on the eccentric bushing and carrying the seamer roll, a sliding member mounted on the spindle and provided with a roll, a cam mounted on the spindle for engaging with the said roll, and a yielding and adjustable member connecting the sliding member and bell crank.

Signed at Brooklyn, N. Y. this 20th day of March 1905.

OTTO S. BEYER.

Witnesses:
H. T. REVEKE,
FRED. H. MCGAHIE.