(No Model.) 2 Sheets—Sheet 1.

# G. R. ALLEN.

## WAX THREAD SEWING MACHINE.

No. 510,951. Patented Dec. 19, 1893.

Fig. 1.

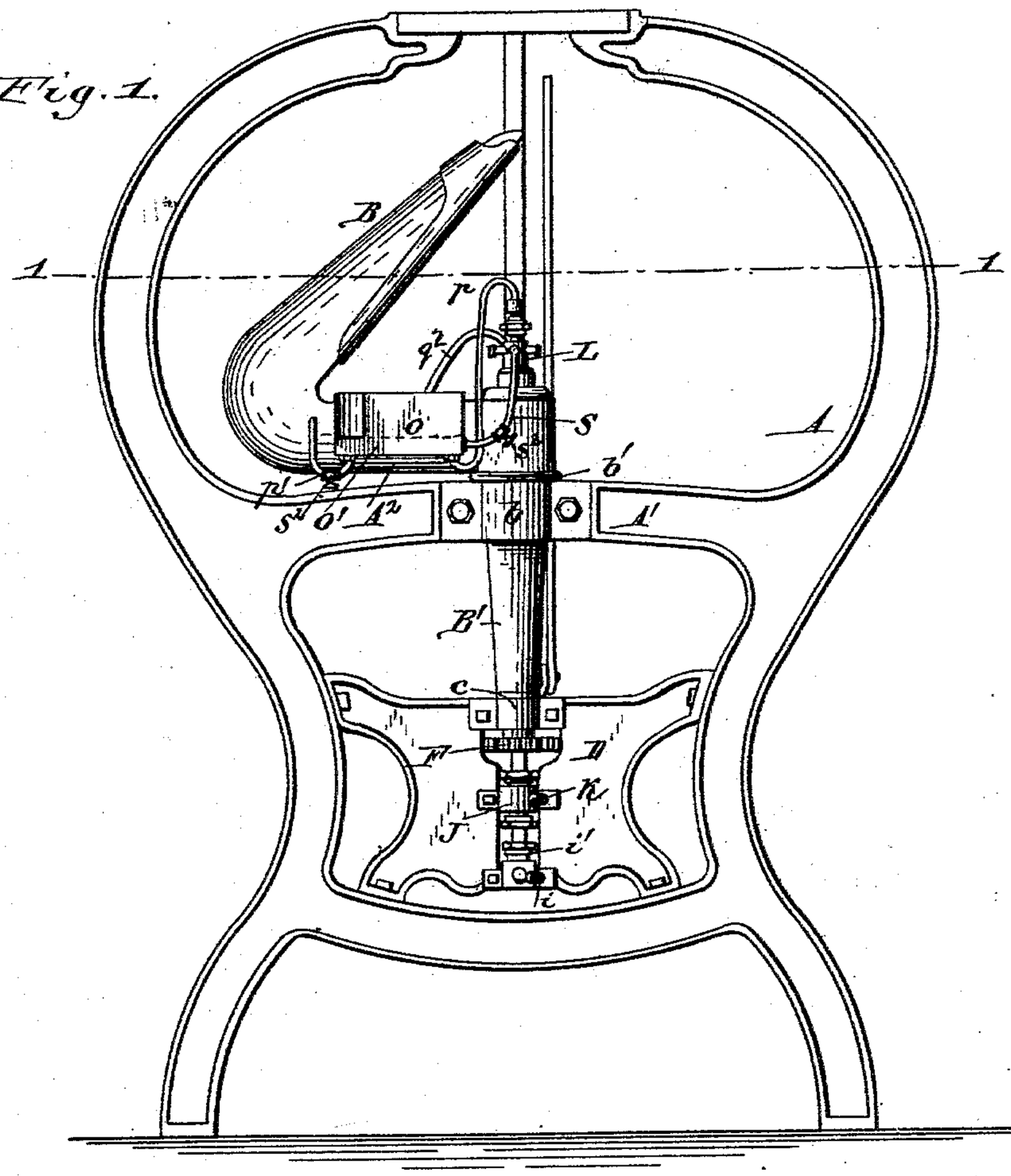
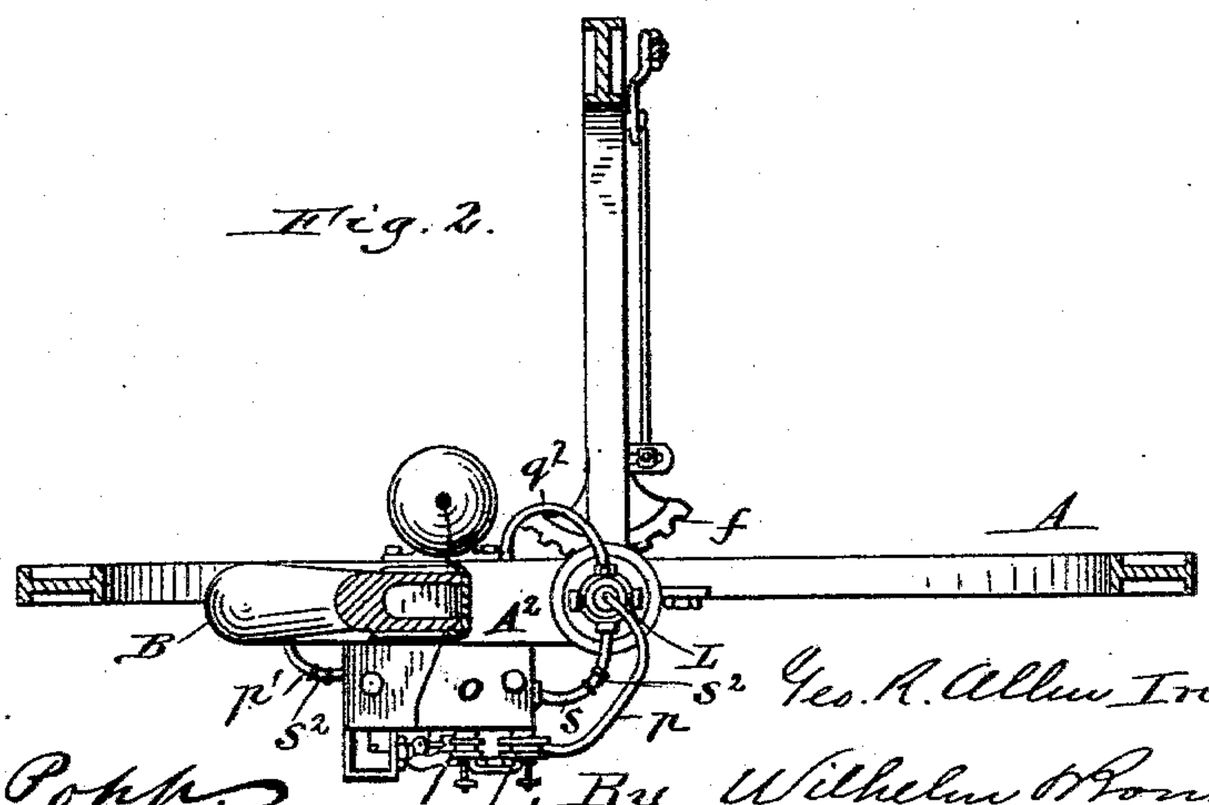



Fig. 2.




Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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## WAX THREAD SEWING MACHINE.

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Fig. 3.

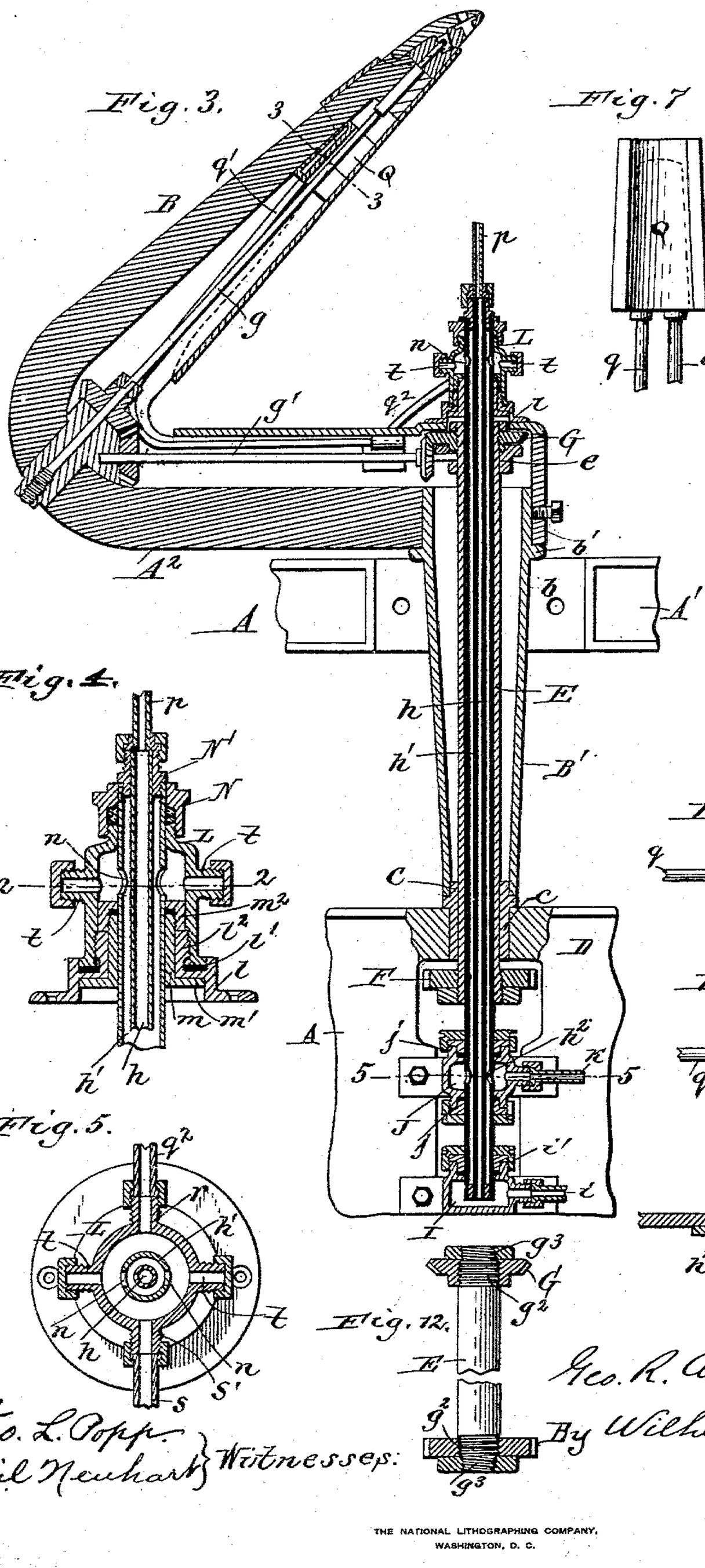


Fig. 7.




Fig. 6.

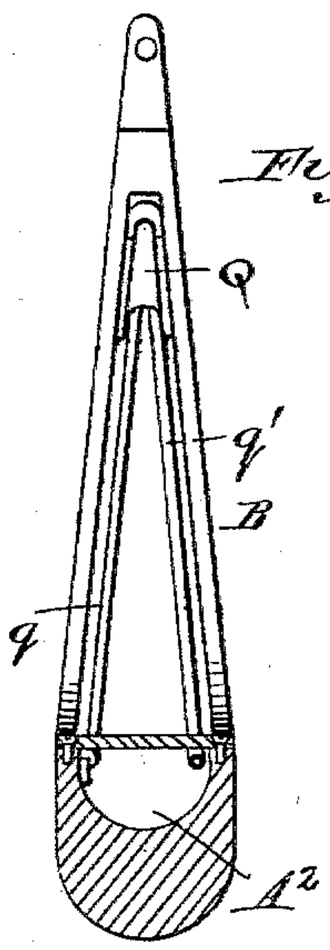


Fig. 4.




Fig. 8.


Fig. 9.

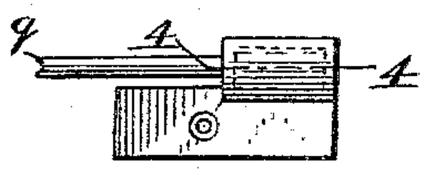


Fig. 10.

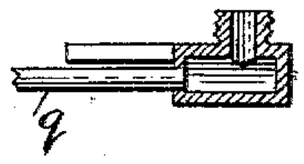


Fig. 5.




Fig. 11.

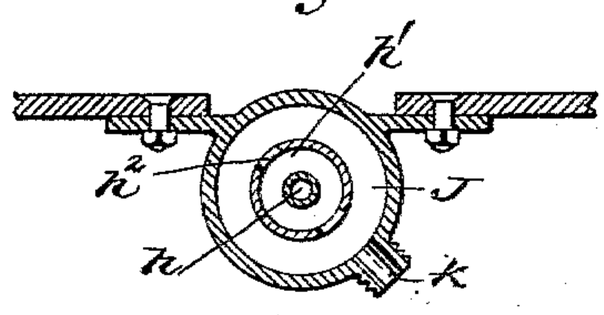


Fig. 12.




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# UNITED STATES PATENT OFFICE.

GEORGE RICHARD ALLEN, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO CHRISTIAN M. SCHMITT, OF SAME PLACE.

## WAX-THREAD SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,951, dated December 19, 1893.

Application filed October 19, 1891. Serial No. 409,196. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE RICHARD ALLEN, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Wax-Thread Sewing-Machines, of which the following is a specification.

This invention relates to wax-thread sewing machines, and more especially to machines of this class which are provided with a horn and a hollow driving shaft which incloses the steam pipes leading to and from the horn.

The objects of my invention are to facilitate the removal and replacement of the steam pipes in making repairs and to improve the construction of the steam head with which the steam pipes of the horn and wax pot are connected.

In the accompanying drawings consisting of two sheets:—Figure 1 is a front elevation of my improved machine with the sewing mechanism omitted. Fig. 2 is a horizontal section thereof, in line 1—1, Fig. 1. Fig. 3 is an enlarged sectional elevation of the horn,—the hollow shaft and adjacent parts. Fig. 4 is a vertical section, on an enlarged scale, of the steam head at the upper end of the hollow shaft. Fig. 5 is a horizontal section thereof, in line 2—2, Fig. 4. Fig. 6 is an interior view of the horn. Fig. 7 is a face view of the steam chamber located in the horn. Fig. 8 is a cross section of the horn in line 3—3, Fig. 3. Fig. 9 is a side elevation of one of the couplings at the lower ends of the steam supply and return pipes of the horn. Fig. 10 is a longitudinal section in line 4—4, Fig. 9. Fig. 11 is a horizontal section in line 5—5, Fig. 3, on an enlarged scale. Fig. 12 is a sectional elevation of the hollow driving shaft of the machine, showing the manner of securing the gear wheels thereto.

Like letters of reference refer to like parts in the several figures.

A represents the frame of the machine which is substantially of the form found in the well-known McKay machine, and B is the horn which is capable of turning in the usual manner. The sewing mechanism which cooperates with the whirl in the tip of the horn is not shown in the drawings and forms no part of my invention.

The upright shank B′ of the horn is hollow and turns with its upper portion in a bearing *b* arranged in the upper cross piece A′ of the frame, the shank being provided with a supporting flange *b′* which rests upon the top of the bearing *b*. The lower end of the hollow shaft is provided with a sleeve or bushing C which turns in a bearing *c* at the upper end of a bridging frame D. This frame is bolted at its sides to the legs of the main frame A, as shown in Fig. 1.

E represents the hollow shaft arranged within the hollow horn-shank and turning with its upper end in a bearing *e* arranged within the hollow arm $A^2$ of the horn and with its lower end in the sleeve or bushing C.

F is the gear wheel secured to the lower end of the hollow shaft and with which the usual gear segment *f* meshes, whereby the shaft is alternately rotated in opposite directions, in a common manner.

G is the bevel wheel secured to the upper end of the hollow shaft, *g* the whirl-shaft journaled in the horn and *g′* the shaft through which motion is transmitted from the hollow shaft to the whirl-shaft by bevel gears. The gear wheels F and G are provided with internally screw-threaded bores which engage with external right-hand threads $g^2$ on the end portions of the hollow shaft and the wheels are reliably secured to the shaft by clamping nuts applied to left-hand threads $g^3$ on the ends of the shaft, as shown in Fig. 12. By this construction, loosening of the gear wheels is impossible, as any retrograde movement of the gears tends to tighten the clamping nuts and more firmly bind the wheels upon the shaft.

*h* is the ascending steam supply pipe extending through the hollow shaft E, and *h′* the descending return pipe surrounding the inner supply pipe and separated therefrom by an annular steam space or passage. The two pipes *h h′* extend below the lower end of the hollow shaft.

I is a steam inlet chamber supported upon the lower portion of the bridging frame D and with which the open lower end of the inner sup-

ply pipe *h* communicates. Steam is supplied to this chamber from any available source by a pipe *i*. The lower end of the outer return pipe *h'* is closed by a plug, as shown, to exclude the steam in the inlet chamber therefrom. This plug is brazed or otherwise secured to both of these pipes, so as to firmly connect them together. The pipes *h h'* enter the top of the inlet chamber through a stuffing box or gland *i'* whereby a reliable joint is formed at this point.

J is a steam exit chamber secured to the bridge frame D above the steam inlet chamber and through which the supply and return pipes *h h'* pass.

*j j* are stuffing glands or boxes arranged respectively at the upper and lower ends of the exit chamber and whereby a close joint is produced around the outer return pipe. Steam passes from the annular space between the supply and return pipes *h h'* into the exit chamber through openings $h^2$ formed in the return pipe, as clearly shown in Figs. 3 and 11. The waste steam is conducted from the exit chamber to a suitable place of discharge by a pipe *k*.

L is a steam-head or manifold supported upon the arm B of the horn, so as to move therewith, and in which the upper portions of the supply and return pipes *h h'* are arranged. This head consists of a cylindrical chamber resting with its lower open end upon a base *l* secured to the arm of the horn by bolts or screws, the base being provided in its upper side with an annular groove or depression *l'* in which the lower flanged end of the head L is seated, and with an externally screw-threaded nipple $l^2$ which engages with the internally threaded lower end of the head.

*m* is a sleeve or bushing arranged in the nipple $l^2$ and surrounding the outer return pipe *h'*. This bushing is provided at its lower end with a flange *m'* which bears against the under side of the base *l* and its upper end is externally threaded to receive a screw cap $m^2$ which bears against the upper end of the nipple $l^2$, so as to retain the bushing in place. Packings are interposed between the lower end of the steam head L and the groove of the base *l* and between the cap $m^2$ and the upper end of the bushing *m*. This construction forms a very tight and reliable joint which effectually prevents leakage of steam through the bottom of the steam head or between the hollow shaft and the bushing *m*. The return pipe *h'* communicates with the interior of the steam head L by openings *n* formed in the pipe within the chamber of the head. As more clearly shown in Fig. 4, the steam head is provided at its upper end with a stuffing box N through which the upper end of the return pipe *h'* passes and whereby a tight joint is formed around said pipe whereby leakage of steam between the pipe and the head is prevented. The return pipe is closed at its upper end by a plug N' which is secured to the upper end of the supply pipe *h* by brazing or otherwise. By firmly uniting the steam supply and return pipes, they can be together withdrawn from the hollow shaft, for making repairs, upon detaching the steam head from the horn and disconnecting the branch pipe from the upper end of the steam supply pipe. This construction facilitates the removal and replacement of these pipes, as the inner pipe is carried by the outer pipe and does not therefore require separate fitting.

O is the pot containing the melted wax and which is provided with the usual steam or heating chamber O', the interior of which is divided by a diaphragm into communicating compartments through which steam is circulated.

*p* is a branch pipe connected with the upper end of the steam supply pipe *h* by a suitable coupling, as shown in Fig. 4, and leading to the steam chamber of the wax pot; and *p'* is a pipe leading from the wax pot to the direct pipe *q* of the horn. The pipe *q* supplies steam to a trough-shaped chamber Q arranged in the horn near its tip.

*q'* is the return steam pipe of the horn connected with the chamber Q and $q^2$ is a branch pipe which leads from the return pipe *q'* to a nozzle *r* of the steam head L, which nozzle communicates with the internal chamber of said head. The trough-shaped chamber Q is secured within the cavity of the horn by screws arranged in openings in the walls of the horn, as shown in Fig. 8.

*s* is an auxiliary branch pipe connected to a nozzle *s'* arranged on the head L, diametrically opposite the nozzle *r*, and leading to the steam chamber of the wax pot. This auxiliary pipe and the chamber *p'* connected with the direct pipe of the horn, are provided with stop cocks $s^2$, so that in case the horn becomes too hot, the steam supply may be shut off therefrom by closing the cock of the pipe *p'*. When the supply to the horn is thus shut off, the cock of the auxiliary pipe is opened, to allow the steam, after circulating through the wax pot, to return directly to the steam head L. After the head L has been repeatedly screwed upon the nipple *l* and removed therefrom, for renewing its packing or for other purposes, the threads become more or less worn, so that upon tightening the head its nozzles do not always coincide with the position of the pipes, but occupy a position on one side thereof, necessitating either a partial unscrewing of the head, which produces a leaking joint, or else undue bending of the pipes in order to connect them to the nozzles. To overcome this difficulty, the head L is provided between the nozzles *r*, *s'* with duplicate steam nozzles *t t* which are adapted to receive the ends of the steam pipes $q^2$ and *s* in case the other set of nozzles are out of register therewith, after tightening the head. By providing the head with duplicate or manifold nozzles, two of the nozzles will always coincide

approximately, if not exactly, with the steam pipes upon tightening the head, thus enabling the pipes to be conveniently connected to the head without excessively bending the same or producing a loose joint of the head. The unused nozzles are closed by plugs or caps to prevent the escape of steam through the same.

In the normal position of the parts, the cock of the pipe $p'$ is open and that of the auxiliary pipe $s$ is closed. The steam entering the inlet chamber I ascends through the inner supply pipe $h$ and passes from the latter through the pipe $p'$ and the heating chamber of the wax pot and thence through the pipe $q$ into the heating chamber Q of the horn, whence it returns through the pipes $q'$, $q^2$, and outer pipe $h'$ into and through the exit chamber. When it is desired to cut off the steam from the horn and supply it only to the wax pot, the cock of the auxiliary pipe $s$ is opened and the cock of the pipe $p'$ is closed, as before described.

I claim as my invention—

1. The combination with the stationary frame of the machine, the movable horn and the mechanism for operating its whirl, of the hollow driving shaft connected with said mechanism, a steam head supported on the horn, steam inlet and discharge chambers supported on the stationary frame, a steam supply pipe arranged within said hollow shaft and terminating with its open lower end in said inlet chamber and extending with its upper portion through said steam head, and a return pipe surrounding said supply pipe, closed at both ends and secured at its ends to the adjacent ends of the supply pipe and provided within said discharge chamber and steam head with lateral ports or passages whereby it communicates with said chamber and head, substantially as set forth.

2. The combination with the stationary frame of the machine, the movable horn and the mechanism for operating its whirl, of the hollow driving shaft whereby said mechanism is actuated, steam supply and return pipes arranged in said hollow shaft, steam inlet and outlet chambers with which said pipes respectively communicate, a steam head or chamber surrounding the upper portion of said steam pipes and having a base provided with a screw-nipple which engages with the screw threaded lower end of the steam head, a sleeve or bushing surrounding the outer steam pipe and having a flange bearing against the under side of the base of the steam head, and a cap applied to the upper end of said bushing and bearing against the screw nipple of the base, substantially as set forth.

3. The combination with the stationary frame of the machine, the movable horn having a heating chamber and the wax pot, of a main steam supply pipe, a steam head mounted on the arm of the horn, a pipe connecting the heating chamber of the wax pot with said main supply pipe, a direct pipe connecting the steam chamber of the horn with the chamber of the wax pot and having a stop cock, a return pipe leading from the chamber of the horn to said steam head, and an auxiliary return pipe connecting the heating chamber of the wax pot with said steam head and having a stop cock, substantially as set forth.

Witness my hand this 10th day of October, 1891.

GEORGE RICHARD ALLEN.

Witnesses:

CHRISTIAN M. SCHMITT,

CARL F. GEYER.