

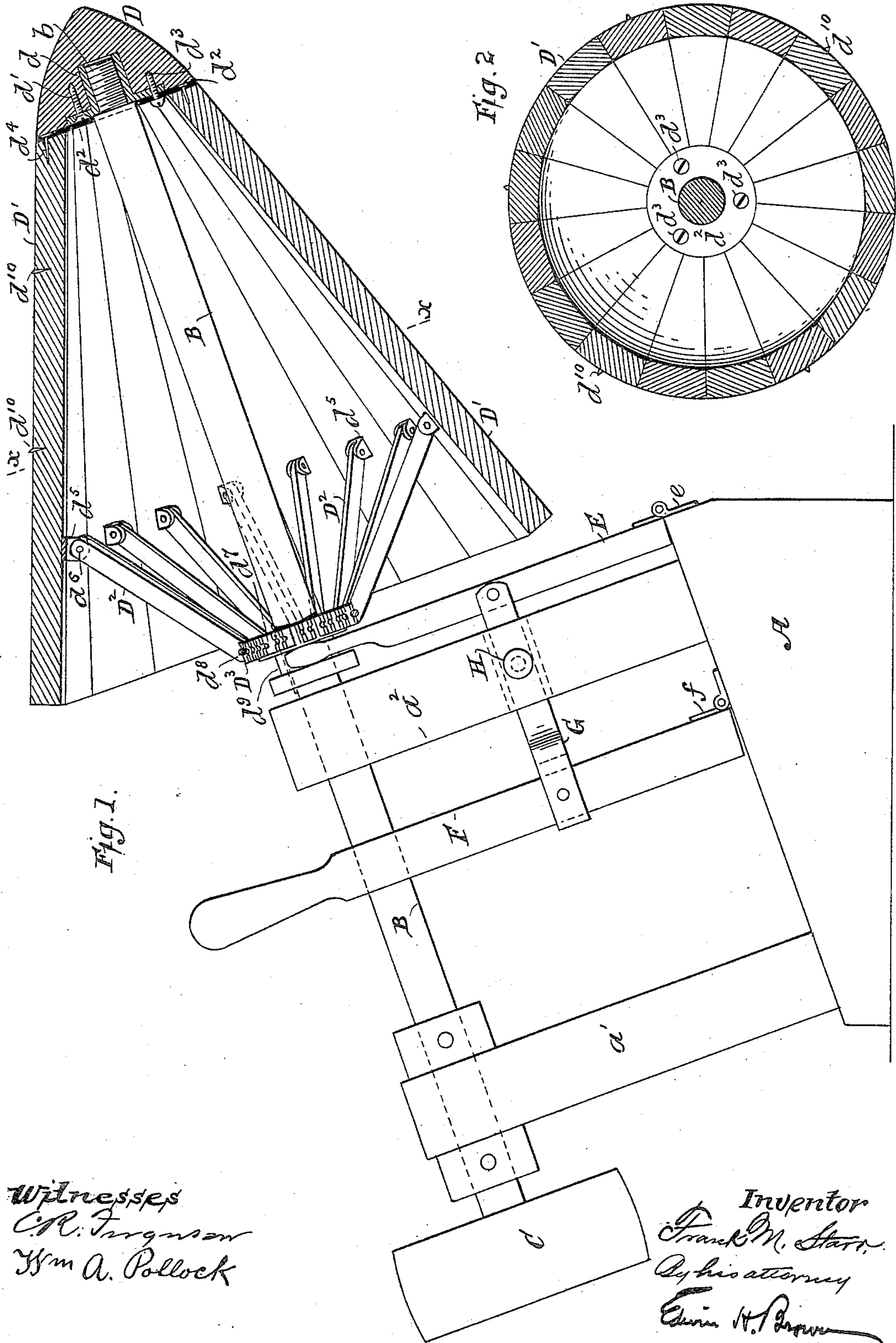
(No Model.)

F. M. STARR.

EXPANSIBLE CONE FOR HAT MAKING MACHINES.

No. 446,396.

Patented Feb. 10, 1891.



Witnesses
C. R. Ferguson
Wm A. Pollock

Inventor
Frank M. Starr.
By his attorney
E. H. Brown

UNITED STATES PATENT OFFICE.

FRANK M. STARR, OF DANBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO CHARLES H. MERRITT, OF SAME PLACE.

EXPANSIBLE CONE FOR HAT-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 446,396, dated February 10, 1891.

Application filed May 24, 1890. Serial No. 352,990. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. STARR, a citizen of the United States, and a resident of Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Expansible Cones, of which the following is a specification.

My improvement consists in an expansible cone for use in the manufacture of hats. Preferably this cone will be made of a head-piece secured to a rotary shaft, a number of slats or rods hinged at one end to the head-piece, a number of braces pivotally connected at one end to the slats or rods, and a runner or traveler movable lengthwise of the shaft and having the other ends of the braces pivotally connected to it.

In the accompanying drawings, Figure 1 is a sectional elevation of an expansible cone embodying my improvement. Fig. 2 is a transverse section of the same, taken at the plane of the dotted line $x x$, Fig. 1.

Similar letters of reference designate corresponding parts in both figures.

A designates a base-block, which may be made of wood or other suitable material and fastened at the bottom to any suitable support. Its upper surface is shown as inclined downwardly toward the rear. On it are mounted two standards $a' a^2$, in the upper portion of which is journaled a rotary shaft B. This shaft has affixed to one end a driving-pulley C, and has fastened to its other end the head-piece D of an expansible cone consisting of the parts D D' D² D³, as hereinafter described. As here shown, this head-piece is of conoidal form, and at the inner end or base is provided with an internally-screw-threaded socket d , which engages with a screw-threaded nipple b on the shaft B. The socket, as here shown, is provided with a flange, which fits into a recess in the inner end or base of the head-piece, and is retained there by screws d' . At the junction of the nipple b with the main portion of the shaft B a shoulder is formed, against which the socket may be forced by screwing it tightly upon the nipple.

D' designates a number of slats or rods comprised in the expansible cone D D' D² D³.

These slats or rods are of rigid material, and are at one end hinged to the head-piece D and near the other are pivotally connected to one end of braces D², which at the other end are pivotally connected to a runner or traveler D³, which is fitted to the shaft B to slide lengthwise thereof. The connection of the slats or rods with the head-piece is to be such that they lie closely together, and their outer surfaces will practically form a continuation of the outer surfaces of the head-piece. Preferably they will be hinged to the head-piece D by means of an intermediate piece of leather or like material d^2 . This piece d^2 is of ring form, the hole in its center being of a size to fit snugly around the main portion of the shaft B close to the nipple, and its circumference corresponding to the circumference of the head-piece D. Near the inner edge this piece d^2 is connected to the head-piece, and near the outer edge it is connected to the ends of the slats or rods D'. The means employed for connecting the piece d^2 to the head-piece, as here shown, consist of screws d^3 , which pass through the piece d^2 , thence through the flange of the socket d , and into the head-piece. Tacks or nails d^4 serve in the present instance to fasten the slats or rods D' to the piece d^2 , and are driven through the piece d^2 into the ends of the slats or rods D'.

The head-piece D and the slats or rods D' may advantageously be made of wood. As here shown, they consist of strips arranged side by side quite closely together. Preferably these slats or rods will be rounded on the outer side, so that together they will form an approximately uniform and continuous curve.

A convenient means for connecting the braces D² to the slats or rods D' consists of strips of metal d^5 , fastened between the ends by screws, nails, or otherwise to the inner sides of the slats or rods and bent so that their end portions will form parallel cheeks or jaws, between which the braces may fit. Pins d^6 , passed through the cheeks or jaws and through the braces, form a pivotal connection.

The runner or traveler D³ is shown as pro-

vided with pairs of cheeks or jaws d^7 , which are adapted to receive the braces between them, and are provided in their outer edges with notches, into which fits a wire d^8 , which
 5 passes through holes in the inner ends of the braces and is bound around the runner or traveler and tied at the ends. By moving the runner or traveler D^3 toward the head-piece the slats or rods D' will obviously be ex-
 10 panded. The movement of the runner or traveler in the reverse direction will of course cause the contraction of the slats or rods. As the ring-shaped piece d^2 is only fastened near the inner edge to the head-piece and
 15 near the outer edge to the slats or rods, it affords such a loose connection between the latter and the head-piece as to permit the slats or rods to swing outward or inward relatively to the head-piece. A considerable move-
 20 ment of the slats or rods at the outer ends may be produced without necessitating any considerable movement of the same at the inner ends.

Any suitable means may be employed for
 25 moving the runner or traveler along the shaft B. As here shown, a lever E is employed for this purpose. At the lower end this lever is fulcrumed to the base-block A by means of a hinge e , and the upper end extends into a
 30 circumferential groove d^9 , which is formed in the hub of the runner or traveler D^3 .

F designates a lever, which is fulcrumed to the base-block A by a hinge f . This lever is connected by a link G to the lever E. Of
 35 course the link is pivotally connected to both of the levers. It is shown as sliding through a slot in the standard a^2 . A hand-screw H, which engages with the standard a^2 and impinges against the link G, serves as a means
 40 for locking the link in different positions, and consequently for securing the runner or traveler in any desired position. Of course the lever E might be used directly as a means for shifting the runner or traveler; but I prefer
 45 a second lever for this purpose. Preferably the slats or rods D' will be provided with outwardly-projecting pins d^{10} for securing hat-bodies upon them and preventing the latter from slipping off.

50 An expansible cone such as I have described will be found very useful in stiffening hat-bodies. In doing this work the hat-bodies while still cone-shaped have the edge portion, which is ultimately to form the brims
 55 of finished hats, dipped in a stiffening-liquid. They will of course have the stiffening-liquid applied to both sides by this treatment; but on that portion of the hat-bodies which ultimately will form the crowns of finished hats
 60 the stiffening is only to be applied to one side of the hat-bodies. At this stage in the manufacture of the hats the sides which ultimately will form the insides of the hats will be outward. The stiffening which is applied to the
 65 portion of the hat-bodies that is to form the crowns of finished hats may be applied by dipping a brush in the stiffening-liquid and

rubbing it onto the hat-bodies while the latter are supported one at a time upon the cone. The cone may have a rotary motion imparted
 70 by hand or power during this operation. The expansibility of the cone in the work of thus stiffening the hat-bodies is advantageous in that it enables the cone to be used with varying shapes and sizes of hat-bodies.

75 My expansible cone may also be used to advantage in pouncing hat-bodies while they are still in the cone shape, for in this operation it is necessary that the cone should fit the bodies well, and the expansibility of my
 80 cone enables it to be adapted to tightly fit hat-bodies of different sizes and thus obviates the necessity for changing cones frequently.

My cone will also be found useful in stretching all sizes of hat-bodies while in the cone
 85 shape to bring them to a standard size.

It is obvious that the cone may be locked when adjusted to any size, so as to preserve it in that condition.

What I claim as my invention, and desire
 90 to secure by Letters Patent, is—

1. The combination of a rotary shaft, mechanism substantially such as described for rotating said shaft, a head-piece flaring from the center outwardly and rearwardly, a num-
 95 ber of slats or rods having a swinging connection at one end with said head and extending longitudinally from said head, so as to be substantially flush therewith, and means substantially such as described for
 100 moving the slats or rods transversely toward and away from the rotary shaft, substantially as specified.

2. The combination, with a rotary shaft and mechanism substantially such as described
 105 for rotating the shaft, of a head-piece on the shaft flaring from its center rearwardly and outwardly, a number of slats or rods arranged closely together and hinged at one end to said head and serving to extend its form longi-
 110 tudinally, a runner on the shaft, and braces connected to the slats or rods and to the said runner, substantially as specified.

3. The combination of a rotary shaft and a number of slats or rods connected thereto
 115 at one end, so as to be free to swing laterally, a number of braces connected to said slats or rods near their other ends, a runner or traveler fitted to slide on said shaft and connected to said braces, a lever for shifting said run-
 120 ner or traveler, and a lever connected by a link to the first-named lever, substantially as specified.

4. The combination of a rotary shaft and a number of slats or rods connected thereto
 125 at one end, so as to be free to swing laterally, a number of braces connected to said slats or rods near their other ends, a runner or traveler fitted to slide on said shaft and connected to said braces, a lever engaging with said run-
 130 ner or traveler, a lever having a link connection with the first-named lever, and a lock for holding the lever in position, substantially as specified.

5. The combination of a rotary shaft, a head-piece secured thereto, a number of slats or rods and a ring of leather or like material fastened near the inner edge to the head-piece and near the outer edge to the slats or rods, a sliding collar or runner, and braces connected to said slats or rods and collar, substantially as specified.

Signed at Danbury, in the county of Fairfield and State of Connecticut, this 10th day 10 of May, A. D. 1890.

FRANK M. STARR.

Witnesses:

T. H. COOLEY,
E. T. HOYT.