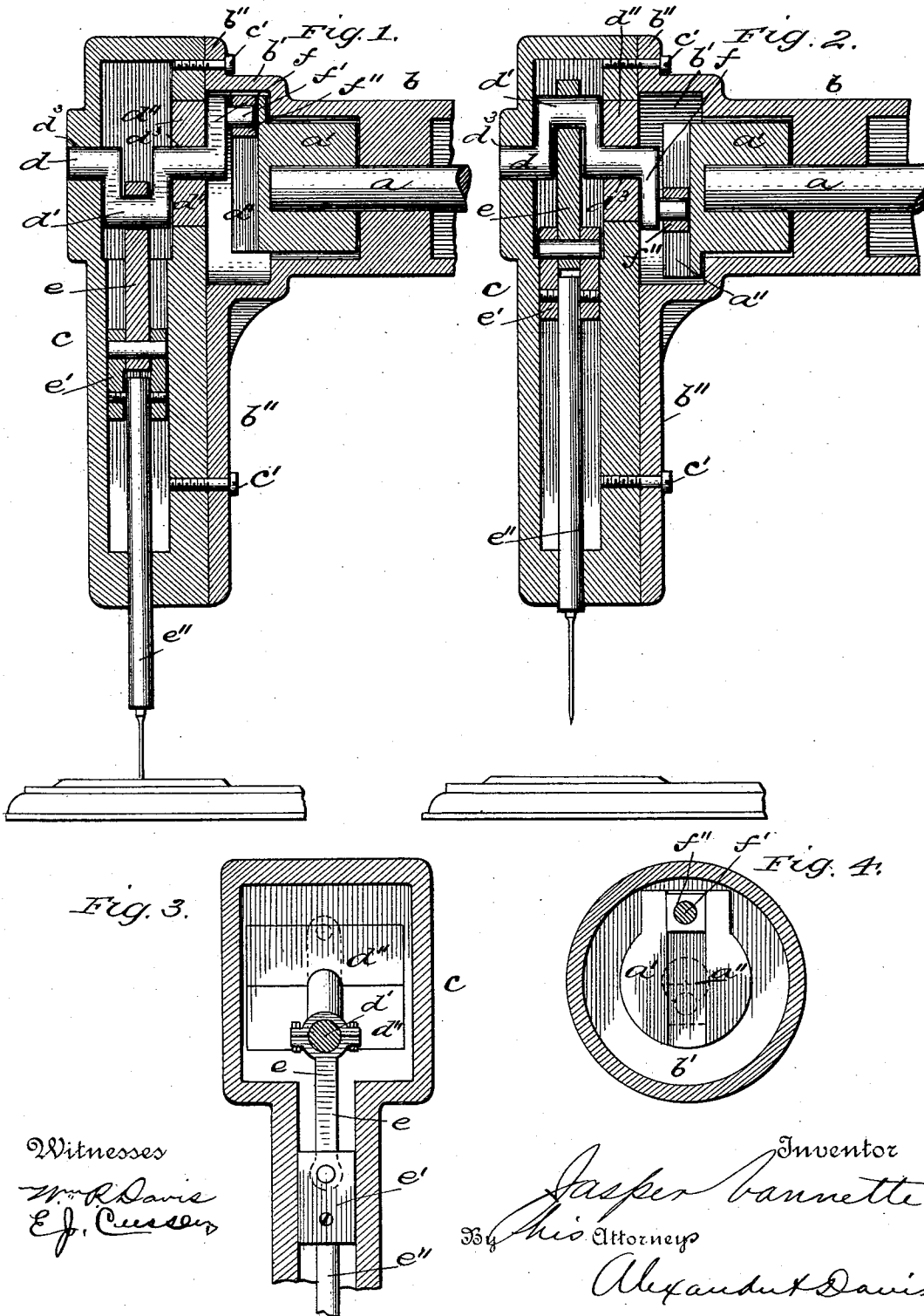


(No Model.)

J. VANNETTE.
SEWING MACHINE.

No. 480,298.

Patented Aug. 9, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

JASPER VANNETTE, OF TIFFIN, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE SINGER MANUFACTURING COMPANY OF NEW JERSEY.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,298, dated August 9, 1892.

Apponlicati filed September 1, 1891. Serial No. 404,469. (No model.)

To all whom it may concern:

Be it known that I, JASPER VANNETTE, a citizen of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figures 1 and 2 represent vertical sectional views of a portion of a sewing-machine, showing the parts of my improvement in different positions; Fig. 3, a detail sectional view showing the parts connecting the crank-shaft to the needle-bar, and Fig. 4 a sectional view showing the cam on the end of the driving-shaft.

This invention relates to certain improvements upon mechanism for operating the needle-bars of sewing-machines; and it has for its objects the provision of simple means for causing the needle-bar to travel faster during the lower half of the stroke than during its upper half, whereby ample time is permitted in which to operate the feed and take-up mechanisms, and also whereby thick fabrics may be sewed with a short-stroke needle-bar, as hereinafter more fully appears.

Other minor objects will appear in the course of this description.

Referring to the drawings by letter, *a* designates the driving-shaft of a sewing-machine, which is journaled in the usual manner in the stationary arm *b* of the machine. On the end of the shaft is rigidly secured a cam *a'*, provided with a groove *a''* across its face, said cam rotating within a cavity *b'*, formed on the end of the arm *b*. To an angular flange or depending portion *b''*, formed on the end of the arm *b*, is secured by means of screws *c'* the face plate or head *c*, which is made hollow to receive and inclose the parts that operate the needle-bar. The advantage of providing a face plate or casing constructed as described and journaling the needle-operating mechanism therein and removably securing it to the outer end of the machine-arm is that said casing and operating mechanism contained therein may be removed when desired from the arm of the machine for clean-

ing or other purposes without affecting the relation or adjustment of the parts contained therein. It also facilitates the assembling of the parts when the machine is first put together. Journaled in bearings in the side of the casing *c* near its upper end is a horizontal shaft *d*, whose axis is substantially parallel with but eccentric to the axis of the main driving-shaft, being journaled a little above the center of the latter. This shaft is bent into a crank-arm *d'* between its ends, and its ends are journaled in bearings *d²* *d³*, formed in the casing *c* on both sides of the said crank-arm. This arm *d'* works within the casing *c* and is connected to a vertical pitman *e*, pivotally connected at its lower end to the upper end of a block or cross-head *e'*, sliding within the casing. This sliding cross-head may be of any desired form, but must fit closely within the hollow casing, the cavity of the casing being the same shape as the cross-head in horizontal section in order to provide a bearing-surface entirely encircling and bearing on the vertical sides of said cross-head, for a purpose that will hereinafter appear. The needle-bar *e''* is secured within a central socket formed in this cross-head by means of suitable set-screws tapped in the cross-head the needle-bar passing through the lower end of the casing and provided with the usual needle-holding devices.

The inner end of the crank-shaft is journaled for convenience of insertion and removal between a pair of removable rectangular bearing-blocks *d''*, said blocks being fitted in the inner side of the casing *c*. The inner end of the crank-shaft is provided with a radial arm *f*, which revolves within the cavity *b'*, formed in the end of the sewing-machine arm, and is provided with a wrist-pin *f'* at its end, said wrist-pin carrying a rectangular block *f''*, which works in the face of the cam.

In operation, it will be observed, the rotation of the main shaft through the medium of the cam and crank-shaft imparts the reciprocating movement to the needle-bar, the block on the end of the radial arm *f* sliding back and forth in the groove in the cam, as is evident.

The essential feature of the invention con-

sists in journaling the needle-bar crank-shaft eccentrically to the driving-shaft, whereby the needle-bar shall have an irregular movement imparted to it, moving quickly while passing through the fabric and slowly during the upper part of its stroke.

It will be observed that when the crank-shaft is in the position shown in Fig. 1 the needle-bar is at its lowest point of movement and the radial arm on the crank-shaft and its sliding block are at their highest points—that is, at the greatest distance from the center of the driving-shaft—and when the crank-shaft is in the position shown in Fig. 2 the needle-bar is at its highest point and the sliding block is at its lowest point and nearest to the axis of the driving-shaft. In this way the leverage of the cam is augmented when the sliding block is in the vicinity of its highest point and decreased when in the vicinity of its lowest point or limit, the result of this necessarily being to move the needle-bar faster during the lower part of its stroke than during the upper portion thereof. Thus moving the needle-bar slower while the needle is above the fabric not only allows ample time in which to operate the feed and take-up mechanisms without in the least reducing the speed of the machine, but it also permits the use of a short-stroke needle-bar in sewing through thick fabrics, as is evident. This arrangement also permits the needle-bar to be shortened, whereby its weight and liability to vibration during operation are materially reduced. It will also be observed that the crank-shaft has a bearing at each end and that the pitman is connected to it between its two bearings, whereby greater durability and better control of the needle-bar are obtained than could be secured by attaching the pitman to the side of the needle-bar in the old way.

The pitman and needle-bar are connected to the cross-head in such a manner that they are in the same vertical plane in all parts of the stroke and when in the position shown in Fig. 3 are in a direct vertical line with each other, whereby the side thrust, due to the old manner of connecting the parts, is avoided.

The advantages of locating the cross-head *e'* within the casing *c* and having it bear on the vertical sides of the cavity of said casing are obvious. The pitman *e*, having a lateral as well as a reciprocating motion, would cause, if secured directly to the needle-bar, a vibration or twisting of said bar; but being secured pivotally to the upper end of the cross-head

e' and this cross-head fitting within the cavity of the casing and having the needle-bar secured to its lower end, the cross-head will receive the thrust of the pitman and the needle-bar will be moved up and down with a perfectly steady motion. It also facilitates the construction, inasmuch as a shorter and consequently much more rigid needle-bar may be used.

I do not confine myself to the exact construction of parts herein shown, as the same may be readily varied without departing from the spirit of the invention in the least.

Having thus fully described my invention, what I claim is—

1. The combination of an arm of a sewing-machine, provided with a cavity, a shaft journaled therein and carrying a cam at its end, said cam working in said cavity, a frame or casing *c*, secured on the end of the arm, removable journal-blocks *d'' d''*, secured in an opening in the casing *c* adjacent to the cavity, a crank-shaft journaled between said journal-blocks and carrying an arm engaging the cam, and means connecting the needle-bar to the crank-shaft, substantially as described.

2. The combination of an arm *b*, a hollow frame or casing *c*, secured on the end of the arm, a crank-shaft removably inclosed in the upper end of the casing and having its ends journaled in opposite sides thereof, means for operating this crank-shaft, a cross-head *e'*, sliding in the hollow casing, a pitman *e*, connecting the cross-head to the crank-arm between its ends, and a removable needle-bar secured to said cross-head in line with the pitman, substantially as described.

3. In a sewing-machine, the combination of the arm thereof, a driving-shaft mounted in said arm, a hollow frame or casing *c* on the arm, a cross-head sliding in said hollow casing, the walls of the cavity entirely surrounding the cross-head and bearing on all its vertical sides, means for connecting the cross-head to the driving-shaft to cause said cross-head to have a reciprocating motion, and a needle-bar connected to the lower end of the cross-head and projecting through the casing and carrying needle-holding devices at its lower end, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JASPER VANNETTE.

Witnesses:

GEO. S. YINGLING,
W. S. WAGNER.