

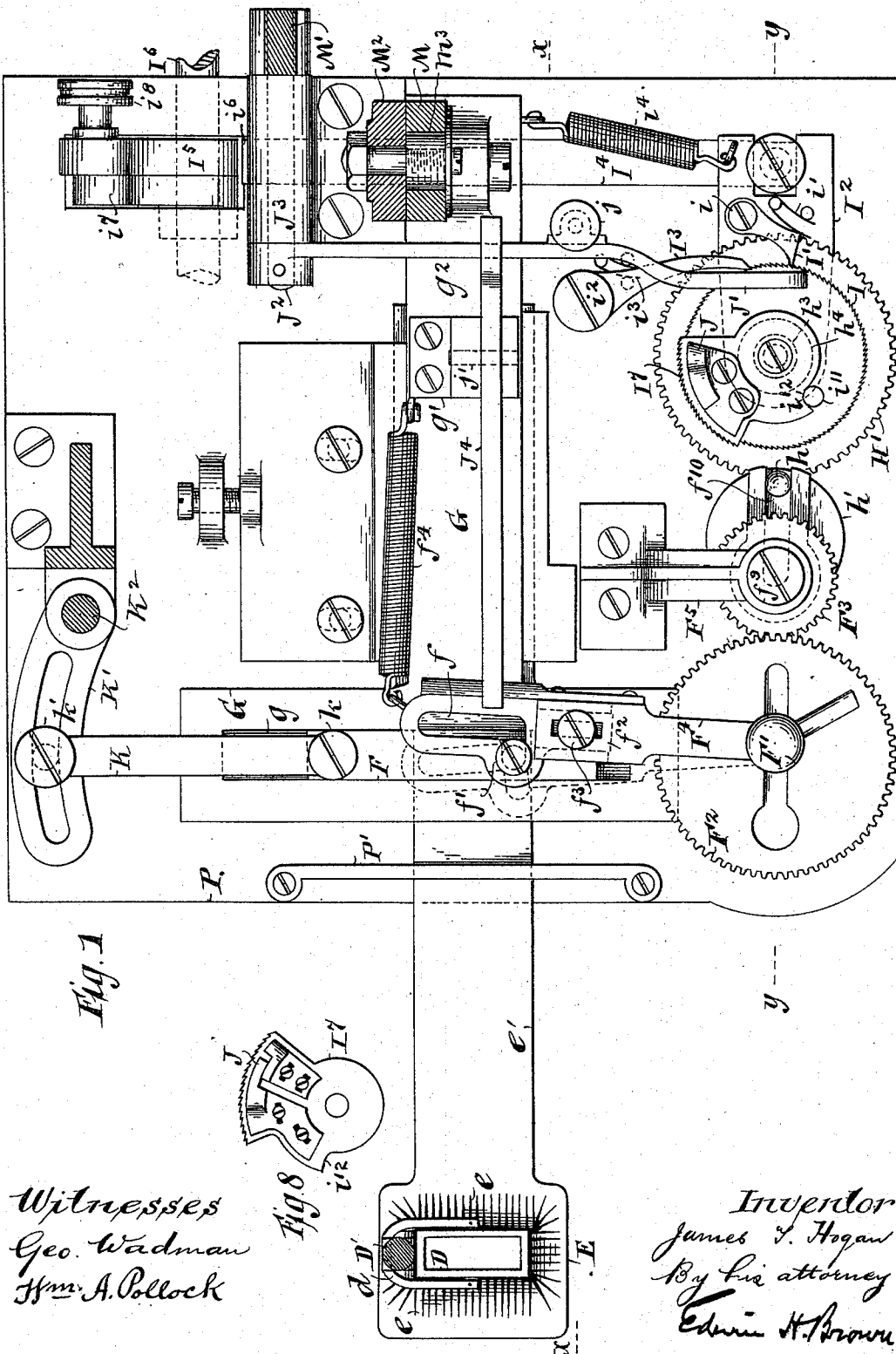
(No Model.)

4 Sheets—Sheet 1.

J. T. HOGAN.
SEWING MACHINE.

No. 570,478.

Patented Nov. 3, 1896.



Witnesses
Geo. Wadman
Hm. A. Pollock

Inventor
James V. Hogan
By his attorney
Edwin H. Brown

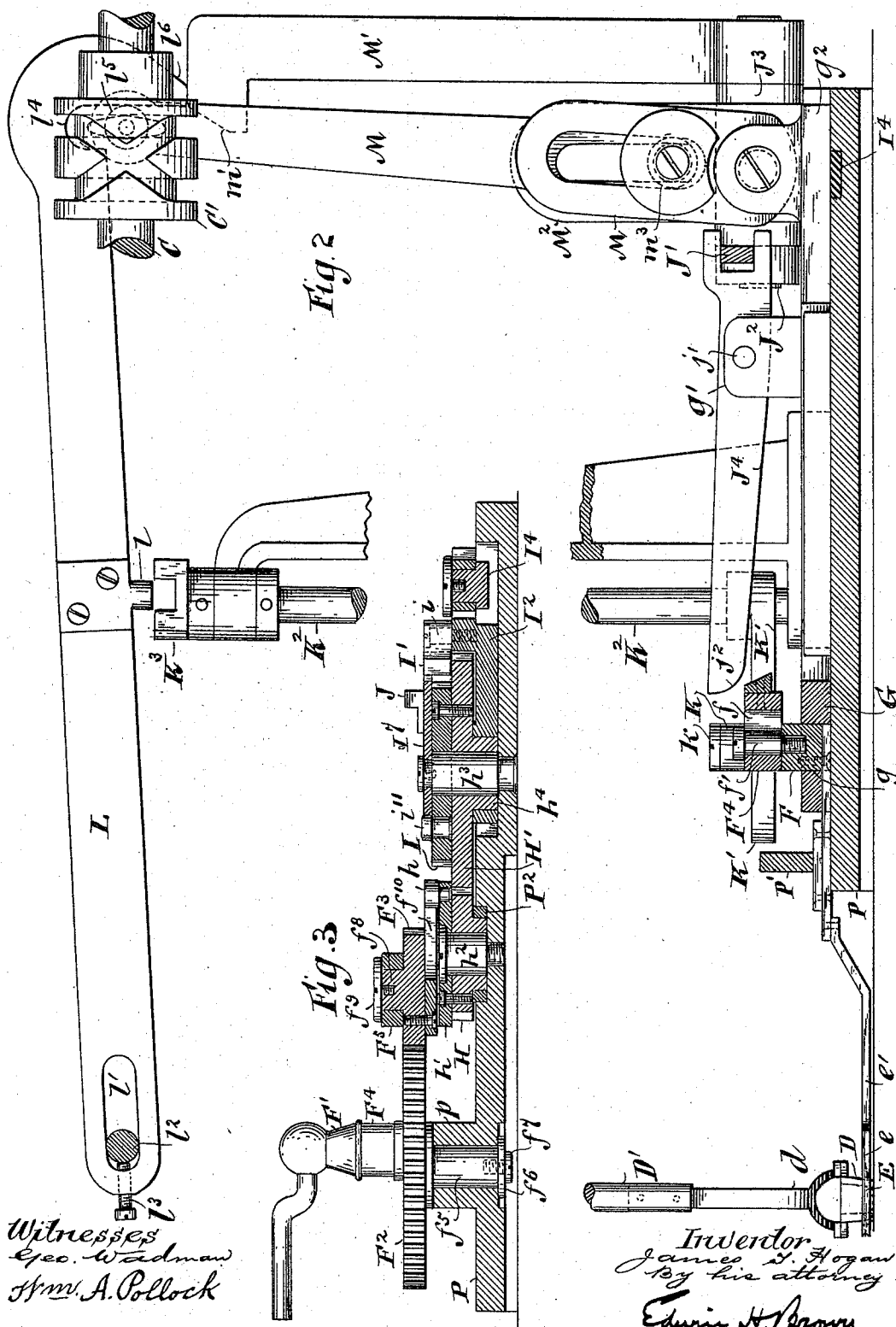
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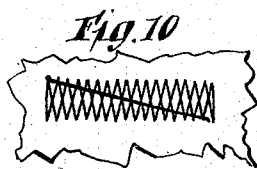
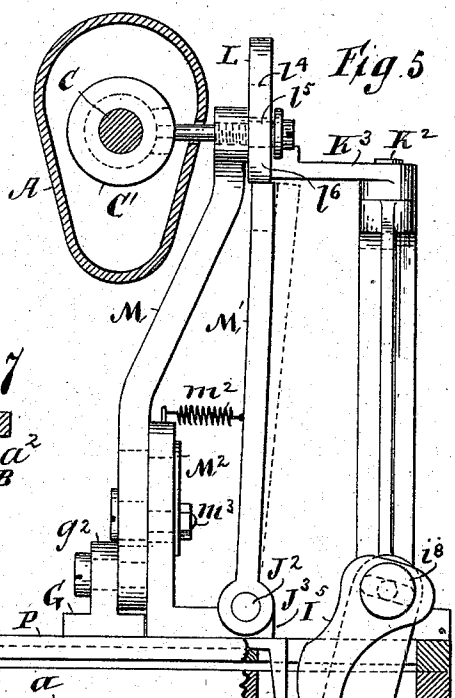
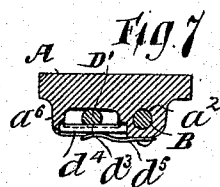
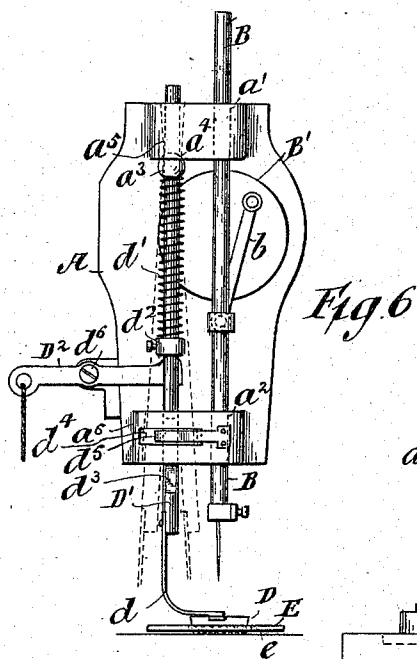
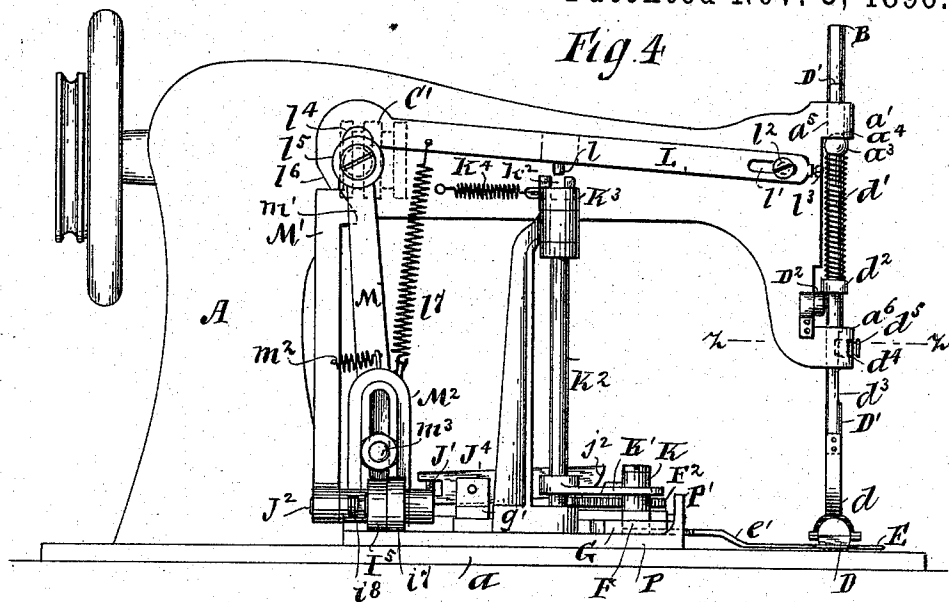
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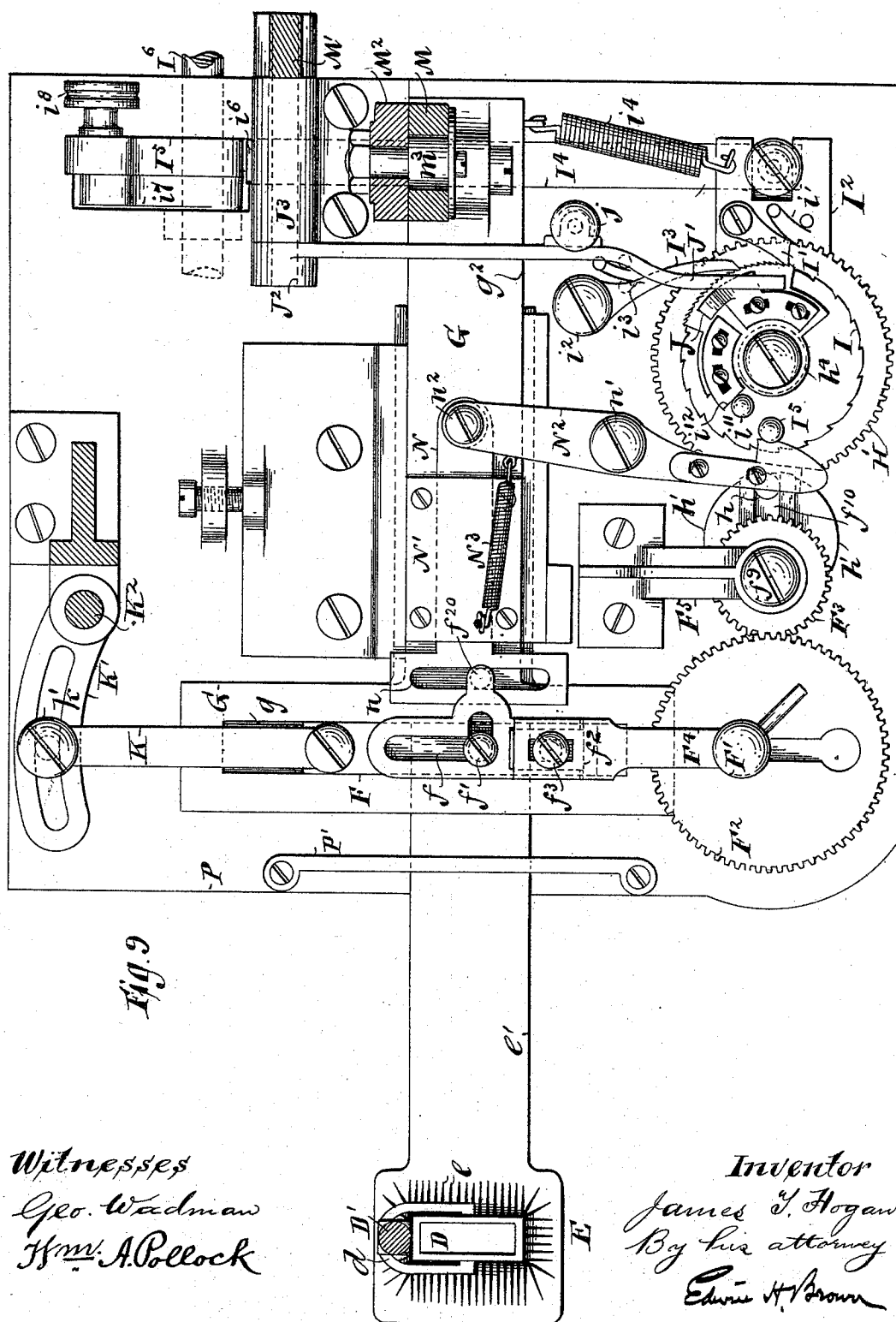
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4 Sheets—Sheet 4.

J. T. HOGAN.
SEWING MACHINE.

No. 570,478.

Patented Nov. 3, 1896.



UNITED STATES PATENT OFFICE.

JAMES T. HOGAN, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE
NATIONAL MACHINE COMPANY, OF NEW YORK.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,478, dated November 3, 1896.

Application filed February 17, 1894. Serial No. 500,543. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. HOGAN, of the city of Jersey City, county of Hudson, and State of New Jersey, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a specification.

This improvement relates particularly to sewing-machines which are employed for doing work of the kind commonly known as "bar-tacking," which consists in first making a number of long stitches and afterward making a number of short stitches across the same. Such work is sometimes done for the purpose of staying, strengthening, or finishing the end of a buttonhole or across the end of a seam, as, for instance, at the mouth of a pocket.

I will describe a machine embodying my improvement and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a plan or top view of a sewing-machine attachment embodying my improvement, certain parts being shown in horizontal section. Fig. 2 is a vertical section of the same taken at the plane of the dotted line xx , Fig. 1. Fig. 3 is a vertical section taken at the plane of the dotted line yy , Fig. 1. Fig. 4 is a rear elevation of a sewing-machine provided with the improvement. Fig. 5 is a transverse vertical section of such a sewing-machine. Fig. 6 is an end elevation of the sewing-machine, illustrating a construction of presser-foot. Fig. 7 is a horizontal section at the plane of the dotted line zz , Fig. 4. Fig. 8 is a detailed view illustrating an adjustable cam. Fig. 9 is a plan or top view similar to Fig. 1, illustrating a modification. Fig. 10 is a plan of a piece of fabric tacked by means of the machine shown.

Similar letters of reference designate corresponding parts in all the figures.

A designates the sewing-machine head. It may be of any approved construction. As here shown, it is provided with a base-piece a .

The stitching mechanism may be of any suitable type. In the present instance it comprises a needle-bar B, which reciprocates vertically in bearings a' a'' , and derives its mo-

tion, through a pitman or rod b , from a crank B', carried by a shaft C, said crank being here represented as made in the form of a wrist-pin projecting from a disk affixed to the shaft.

In this improvement I employ a special presser-foot mechanism, which I will now describe.

D designates the presser-foot. It may be of any suitable construction. As here shown, it is of ordinary form. It has a shank d , consisting of a resilient strip of metal, and this shank is attached to the lower end of a presser-foot bar D', which is capable not only of a vertical reciprocating motion, but also of vibrating transversely in two directions, which are at right angles to each other.

The upper portion of the presser-foot bar D' is supported by a bearing a^3 , which is spherical at the upper part, so as to fit in a concave recess forming a bearing a^4 , wherein the bearing a^3 is supported. A spring d' is coiled around the presser-foot bar, between the under side of the bearing a^3 and a collar d^2 , which is supported adjustably in position upon the presser-foot bar by means of a screw or otherwise. The lower side of the bearing a^3 will preferably be flat, so as to form a suitable seat for the upper end of the spring. The spring holds the bearing a^3 in the bearing a^4 , and the latter supports the upper portion of the presser-foot bar, allowing it to reciprocate vertically and vibrate or swing in any direction. The upper extremity of the presser-foot bar passes through a hole a^5 , which is made upwardly flaring, so as to allow of the vibrating movement of the presser-foot bar.

The lower portion of the presser-foot bar has a flat surface d^3 , and that portion on which this flat surface is formed reciprocates through a lug a^6 . In the front side of this lug is a horizontal recess or notch, which may be seen by reference to Fig. 6. Within this recess fits a block or gib d^4 . In this lug is a vertical opening of such size and shape as to permit of the presser-foot bar vibrating or swinging in any direction. The block d^4 bears against the flat surface d^3 of the presser-foot bar, it being held in contact therewith

by means of a spring $\bar{d}^5$, which is fastened to the front of the lug a^6 and extends into its recess and against the block d^4 .

The block or gib d^4 , being flat at the back, coacts with the flat surface $\bar{d}^3$ of the presser-foot bar in such manner as to prevent any rotating of the latter. Owing to this, it does not interfere with the vibration or swinging of the presser-foot bar in a plane toward and from the needle-bar. As the spring $\bar{d}^5$ allows for a movement of the block d^4 within the recess of the lug a^6 , provision is afforded for a swinging or vibrating motion of the presser-foot bar in the direction of the length of the sewing-machine head.

The vibrating movements of the presser-foot, and consequently of the presser-foot bar, are derived from the cloth-clamp.

Any suitable means may be employed for raising and lowering the presser-foot. In the present instance I have shown a lever D^3 , fulcrumed by a screw $\bar{d}^6$ to a lug extending from the sewing-machine head. One end of this lever projects under the collar $\bar{d}^2$. The other end may be provided with any suitable means for facilitating its manipulation. When this lever is oscillated in one direction, the presser-foot bar will be raised, and when the lever is released the spring $\bar{d}^7$ will lower the presser-foot to its operative position.

E designates a cloth-plate, upon which the material to be tacked is laid. It may be of any suitable construction. In the present instance it is of rectangular form and has a number of corrugations or serrations e to obviate the slipping of the fabric. It will of course be understood that the fabric is to be held upon the cloth-plate by the presser-foot.

The cloth-plate E is shown as having a shank e' , which extends over a plate P. Upon this plate is mounted much of the mechanism employed in my improvement, this feature of construction being adopted so that the mechanism may be used in the form of an attachment. A bar P' holds the shank of the cloth-plate in contact with the plate P.

The shank of the cloth-plate is attached to the under side of a feed slide-block F, which is here represented as made rectangular in form and as fitted into a slot g , formed in a vibrating plate G, the slot being preferably longer than the feed slide-block, so as to allow of the independent movement of the latter.

The movement of the feed slide-block within the slot g of the vibrating plate is for the purpose of feeding a fabric in the direction of the length of a bar or tack, by which I mean a piece of work such as is illustrated in Fig. 10.

Motion is imparted to the feed slide-block F lengthwise of the slot g in the vibrating plate G by means of a crank F', which is here shown as fastened to a feed-disk F², so as to be adjustable radially for the purpose of varying the length of movement transmitted to the feed slide-block. The feed-disk F² is here

shown as made in the form of a gear-wheel meshing with a gear-wheel F³ of half the size.

To the crank F' is pivotally connected one end of a rod or pitman F⁴, that engages with the feed slide-block F, engagement being made in the present instance by means of an L-shaped slot f in the rod or pitman F⁴ and a screw-stud f' , inserted in the feed slide-block. The slot f is here shown as formed in a separate piece, which is adjustably connected to the main part of the rod or pitman F⁴ by means of a slide f^2 and a screw f^3 , this feature of construction being adopted to afford an adjustment to suit bars or tacks of different lengths.

Normally that portion of the L-shaped slot f which is transverse to the length of the rod or pitman F⁴ is in engagement with the stud f' , this engagement being maintained by means of a spring f^4 , which at one end is connected to the outer end of the rod or pitman F⁴ and at the other end to an appurtenance g' of the vibrating plate G.

The feed-disk F² is provided with a shaft f^5 , which may be formed integral with it. This shaft f^5 is supported in a bearing p , formed on the base-plate P. On the lower end of the shaft f^5 a washer f^6 is arranged, said washer being of larger diameter than the shaft, and hence being of a size to overlap the base-plate P adjacent to the bearing p . A screw f^7 passes up through this washer and engages with a tapped hole in the bottom of the shaft f^5 , thus holding the shaft in place. The gear-wheel F³ is provided with a shaft f^8 , which may be made integral with it, and is shown as extending upwardly into a bearing formed in a bracket F⁵, which is fastened to the base-plate P. A screw f^9 , having a head large enough to lap over the top of the bracket F⁵, engages with the upper end of the shaft f^8 , thereby holding the gear-wheel F³ in position. Preferably, a washer, of leather or like material, will be interposed between the head of the screw f^9 and the top of the bracket F⁵ for the purpose of producing friction sufficient to obviate any accidental movement of the gear-wheel F³. On the under side of the gear-wheel F³ is a radial slot or opening f^{10} . As here shown, this slot is formed in a separate block or piece of metal, which is secured to the under side of the gear-wheel by means of screws or otherwise. With this radial slot f^{10} engages a pin or stud h , which is carried by a gear-wheel II, it being in the present instance fitted to a disk h' , that is secured by screws or otherwise to the top of the gear-wheel II.

The gear-wheel II is mounted upon a stud h^2 , which is shown as made in the form of a screw engaging with the base-plate P, and having an enlarged head for the purpose of holding the gear-wheel in place. The gear-wheel II is shown as having a cylindric hub that extends down into a recess formed in the upper side of the base-plate P, but it does not have a bearing in this recess, but, on the

contrary, has a bearing in the plate P^2 , which is secured in said recess. The use of this plate is not important except as it affords facility of manufacture and in fitting parts.

It will, of course, be understood that the gear-wheel H is so arranged relatively to the gear-wheel F^3 that the axes of the two wheels will be out of line. This is illustrated in Fig. 3.

The gear-wheel H engages with a ratchet gear-wheel H' . It may be remarked that the gear-wheel H' is of the same size as the feed-disk F^2 , and that the gear-wheels F^3 and H are of the same size.

The gear-wheel H' is fitted to a stud h^3 , affixed to the base-plate P in any suitable manner, as, for instance, by being riveted thereto. I have shown the gear-wheel H' as having a tubular hub h^4 , which fits the stud h^3 and extends down into a recess formed in the base-plate P .

I designates a feed-wheel, which is here shown as provided on its periphery with ratchet-teeth. It is fastened to the upper side of the gear-wheel H' .

I' designates a pawl, pivoted by a pin or screw i to a pawl-lever I^2 , and held in engagement with the periphery of the feed-wheel by means of a spring i' . The pawl-lever I^2 has a bearing upon the tubular hub of the gear-wheel H' , so as to be free to oscillate about the same. When the pawl-lever is moved in one direction, the pawl will impart a corresponding movement to the feed-wheel; but when the pawl-lever is moved in the reverse direction its pawl will merely play over the teeth of the feed-wheel, the latter being prevented from movement at this time by means of a stop-pawl I^3 , which is pivoted to a pin or stud i^2 , fastened in the base-plate P and held in engagement with the teeth of the feed-wheel by means of a spring i^3 .

Motion is imparted to the pawl-lever I^2 by means of a feed-bar I^4 , that is here shown as fitted to slide in a recess formed in the top of the base-plate. The operative movement of the feed-bar I^4 is produced positively, but its return movement is shown as being caused by a spring i^4 , fastened at one end to the pawl-lever I^2 and at the other end to the base-plate P or an appurtenance thereof. The operative motion of the feed-bar is produced by means of a cam-bar I^5 operating upon a toe or end piece i^5 , with which the feed-bar is provided. The cam-bar I^5 consists of a bar having a cam-shaped surface opposite the end of the feed-bar I^4 , and mounted loosely at one end upon a shaft I^6 , and fastened at the other end to an arm i^7 , which is rigidly affixed to the shaft I^6 , the fastening device here shown, consisting of a clamping-screw i^8 , extending through a transverse slot in the bar I^5 and engaging with a tapped hole in the arm i^7 . The shaft I^6 has also affixed to it an arm i^9 , which, in conjunction with the arm i^7 , may be considered as in effect forming a bell-crank or elbow lever.

Motion may be obtained for rocking the

shaft I^6 through a pitman or rod i^{10} , driven from any suitable part of the machine, as by an eccentric.

The advantage of adjusting the cam-bar I^5 is to adapt the machine for making bars or tacks of different coarseness in the cross-stitches, or, in other words, making the cross-stitches closer together or farther apart.

With the feed-wheel I and its pawl I' is combined a segment I^7 , which is here shown as fitted to the upper part of the stud h^3 , so as to be capable of rotating around the same. In the present instance it is held in place by means of a screw engaging with the upper end of the stud h^3 and having an enlarged head. This plate I^7 is intended to suppress the action of the pawl I' upon the feed-wheel I for certain periods. It is therefore made on a larger radius than the feed-wheel I . It has ratchet-teeth upon its periphery, and preferably these will be made upon a rim-shaped piece which extends across the periphery of the feed-wheel, although this is not essential if the pawl be made wide enough to extend across both the edge of the plate I^7 and the feed-wheel.

As the feed-wheel I is rotated by the pawl I' , it will carry the plate I^7 into engagement with said pawl, and thereafter the pawl will for a time merely rotate the plate I^7 . The stop-pawl I^3 will also coact with the plate I^7 . Thus a dwell of the feed-wheel I will be produced. After the pawl I' shall have moved the plate I^7 as far as possible the pawl I' will move into engagement with the feed-wheel I again and impart motion thereto. It is intended that the plate I^7 , by its friction or otherwise, shall now remain at rest until a pin i^{11} , which is carried by the feed-wheel, impinges against a shoulder i^{12} of the plate I^7 . After this happens the feed-wheel I will carry the plate I^7 along with it until the latter again comes into engagement with the pawl. The dwell produced by the plate I^7 provides for the making of the long stitches and suspends the operation of making the cross-stitches in producing a bar or tack.

Having now described the movement which produces the regular progressive feed necessary for the short cross-stitches, I will explain a mechanism whereby a quick movement in the same general direction, or, in other words, longitudinally of a bar or tack, may be produced for the making of the long stitches.

J designates a cam carried by the plate I^7 . It coacts with a lever-arm J' , affixed to a rock-shaft J^2 , the latter being journaled in a bracket J^3 , affixed to the base-plate P . Preferably the lever-arm J' will be provided with a screw j , which by resting upon the base-plate P will support said lever in its raised position, and thereby relieve from wear that surface of the lever-arm which coacts with the cam J .

J^4 is a lever fulcrumed by a pin j' in the block or bracket g' , previously mentioned as a point of connection for the spring a^4 , this

block being an appurtenance of the vibrating plate. Whenever the cam J raises the lever-arm J', it will raise one arm of the lever J⁴, and of course depress the other. The latter has a cam-surface j^2 , which engages with an inclined surface with which the adjacent side of the rod or pitman F⁴ is provided. Hence, when the lever J⁴ is operated, it will move the rod or pitman transversely against the resistance of the spring f^4 , and thus it will disengage from the pin or stud f' of the feed slide-block F the transverse portion of the L-shaped slot f with which the rod or pitman F⁴ is provided. This has the effect of disconnecting the feed slide-block F from the rod or pitman F⁴ and leaving the feed slide-block free to be operated by other means.

The cam J may be removed and another one of a different size substituted for it, or it may be so constructed as to be longitudinally adjustable.

K designates a rod or pitman, connected at one end by a pin or screw k with the feed slide-block, and at the other end by means of a clamping-screw k' of the lever-arm K'. This lever-arm is arc-shaped and longitudinally slotted to provide for connecting the clamping-screw k' at different points in the length of the arm. The lever-arm K' is affixed to an upright shaft K², which has a lever-arm K³ affixed to its other end. In the upper surface of this lever-arm K³ is a longitudinal slot k^2 , for the reception of a pin or stud l , with which a rod L is provided. This rod L is provided near one end with a longitudinal slot l' , and through this passes a supporting pin or screw l^2 , which extends into the sewing-machine head. By this means of supporting the rod L provision is afforded not only for a longitudinal movement, but also for a swinging movement. The longitudinal movement may be limited by means of a pin or screw l^3 , extending through the end of the rod into the slot l' . At the other end of the rod there is a hub or transverse notch l^4 , for engaging with a pin or screw l^5 , carried by a lever M, which is vibrated lengthwise of the sewing-machine head by means of a cam C', affixed to the shaft C. When the rod L is engaged with the pin or screw l^5 of the lever M, it is obvious that the motion imparted to the lever M will produce a longitudinal movement of the rod L. As the pin or stud l of the rod L is engaged with the lever-arm K³ whenever the hub or notch l^4 of said rod L is engaged with the lever M, it must be obvious that the motion of the cam C' is periodically transmitted to the lever-arm K³, and hence, through the shaft K², lever-arm K', and pitman or rod K, to the feed slide-block. This of course will be at a time when the feed slide-block is disconnected from the rod or pitman F⁴, and will be a quick movement sufficiently long for the long stitches used in making a bar or tack.

The engagement of the rod L with the pin or screw l^5 of the lever M is controlled by a lever M', which is affixed to the rock-shaft J².

It swings toward and from the side of the sewing-machine head, and it assumes its position adjacent to the side of the sewing-machine head while the rod L is in its forward position, or, in other words, in its movement toward the needle-bar. It has an inclined surface m' , and the rod L has a corresponding inclined surface l^6 . Hence, when the lever-arm M' is moved into a position adjacent to the side of the sewing-machine head and the rod L moved back to its normal position, the inclined surface l^6 of the rod L will ride up the inclined surface m' of the lever-arm M', and this will effect the disengagement of the hub or notch of the rod L from the pin or screw l^5 of the lever M.

The downward or engaging movement of the rod L is produced by a spring l^7 , and the movement of the lever-arm M' toward the sewing-machine head is produced by means of a spring m^2 .

Obviously, whenever the rod L is moved upwardly to disengage it from the pin or screw l^5 , it is also disengaged from the lever-arm K³. The latter will then be moved into its normal position by means of a spring K⁴, but as the rod L ought to return the lever-arm K³ to its normal position before disengagement, the employment of the spring K⁴ is a mere matter of precaution. When the spring is used, it will of course move the lever-arm K³ far enough to bring the pin or screw f' of the feed slide-block to that end of the slot f of the rod or pitman F⁴ which is the nearer to the crank f' , and this end of this slot f will form a stop limiting the action of the spring K⁴.

It will of course be understood that after the rod L is disengaged from the lever-arm K³ the latter will be left free to move with the feed slide-block, it having then, of course, no function.

Having described the two mechanisms for producing the movements lengthwise of a bar or tack, I will now briefly describe the means for producing the vibratory motion necessary for the cross-stitches, premising that these means may be of any ordinary form.

The vibrating plate G has a shank g^2 , which is connected with the lower end of the lever M. This lever is fulcrumed between its ends upon a screw m^3 , which is capable of adjustment lengthwise of a vertical slot formed in a stationary bracket M² to vary the length of the cross-stitches, or, in other words, to vary their width of bight.

The modification illustrated by Fig. 9 differs from the first example of my improvement with reference to the means for effecting the engagement and disengagement of the rod or pitman F⁴ and the feed slide-block F. It will be seen that the L-shaped slot f of the rod or pitman F⁴ has the transverse portion extended reversely in Fig. 9 to the direction in Fig. 1.

In Fig. 9 the rod or pitman F⁴ is provided with a vertically-extending pin f^{20} , and this

is here shown as affixed to the adjustable end piece in which the slot f is formed. This pin f^{20} engages with a slot n , extending parallel with the length of the feed slide-block F and formed in a slide-piece N. The slide-piece N is shown as made T-shaped, and its shank is fitted in a bearing-block N', mounted on the vibrating plate.

N² is a lever fulcrumed between its ends upon a pin or screw n' and fastened at one end by a pin or screw n^2 to the shank of the slide-piece N. A spring N³ is fastened to this end of said lever and also to the bearing-block N'. Hence, this spring serves to move the slide-piece N in such direction as to effect an engagement between the transverse portion of the slot f in the rod or pitman F⁴ and the pin or screw f' and to maintain such engagement. The other end of the lever N² coacts with an upright pin I⁵, carried by the feed-wheel, and this pin vibrates the lever at such time as to move the transverse portion of the slot f in the rod or pitman F⁴ out of engagement with the pin or screw f' , so as to allow the feed slide-block to be operated through the agency of the rod or pitman K.

I claim—

1. In a sewing-machine, the combination of a plate for the fabric to be sewed, mechanism for imparting to the plate a zigzag to-and-fro movement and a longitudinally-reciprocating movement, a presser-foot for holding the fabric upon said plate, a presser-foot bar, and supports for the bar comprising a ball and ball-bearing at the upper portion of the bar through which the latter is movable longitudinally, and a spring-pressed block at the lower portion of the bar along which the bar may slide, said block being movable transversely to its length to admit of the corresponding movement of the bar, substantially as specified.

2. In a sewing-machine the combination of a plate for the fabric to be sewed, a support for the plate carrying it in the direction of the length of a row of stitches to be made, a crank for imparting to said support the necessary feeding movement in making a row of stitches, a connecting-rod connecting said support with said crank, mechanism for independently imparting to said support a longitudinal reciprocating movement in the direction of the feeding movement, and means for disconnecting said connecting-rod from said support and rendering the aforesaid mechanism operative, and for connecting said connecting-rod with said support and rendering said mechanism inoperative, substantially as specified.

3. In a sewing-machine, the combination of a plate for the fabric to be sewed, a support for the said plate carrying it in the direction of the length of a row of stitches which are to be made, a crank and connecting-rod the latter having an L-shaped slot for engaging and disengaging the said connecting-rod with and from a stud for imparting to said support the necessary movement for the feed in making

said row of stitches, a mechanism for imparting to said support independently of said crank and connecting-rod a long movement necessary for making a long stitch lengthwise of the said row of stitches, and means for engaging the said connecting-rod with the said support and simultaneously rendering the said mechanism inoperative and for disengaging the said connecting-rod from the said support and rendering the said mechanism operative, substantially as specified.

4. In a sewing-machine, the combination of a plate for the fabric to be sewed, a support for the said plate carrying it in the direction of the length of a row of stitches to be made, a crank for imparting to said support the necessary feeding movement in making a row of stitches, a connecting-rod connecting said support with said crank, mechanism for independently imparting to said support a longitudinal reciprocating movement in the direction of the feeding movement, a lever for disconnecting the connecting-rod from said support, and a cam for tilting the lever, substantially as specified.

5. In a sewing-machine, the combination of a plate for the fabric to be sewed, a support for the said plate carrying it in the direction of the length of a row of stitches which are to be made, mechanism for imparting to said support the necessary movement for the feed in making said row of stitches, a connecting-rod connected with said support, a lever K', K², K³, with which said connecting-rod is connected, an arm L for actuating said lever, a lever M for imparting motion to said arm L, a cam C' for actuating said lever M, and means for engaging and disengaging said arm L and the levers K', K², K³ and M and also for controlling the operation of the first said mechanism whose function it is to operate said support for the feed necessary in making the row of stitches, substantially as specified.

6. In a sewing-machine, the combination of a plate for the fabric to be sewed, a support for the said plate carrying it in the direction of the length of a row of stitches to be made, a crank for imparting to said support the necessary feeding movement in making a row of stitches, the throw of the crank being made adjustable, a connecting-rod connecting said crank with said support with which latter it is adjustably engaged, mechanism for independently imparting to said support a longitudinal reciprocating movement in the direction of the feeding movement, a lever for disconnecting the connecting-rod from said support, and a cam for tilting the lever, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES T. HOGAN.

Witnesses:

ANTHONY GREF,
S. A. PALMER.