

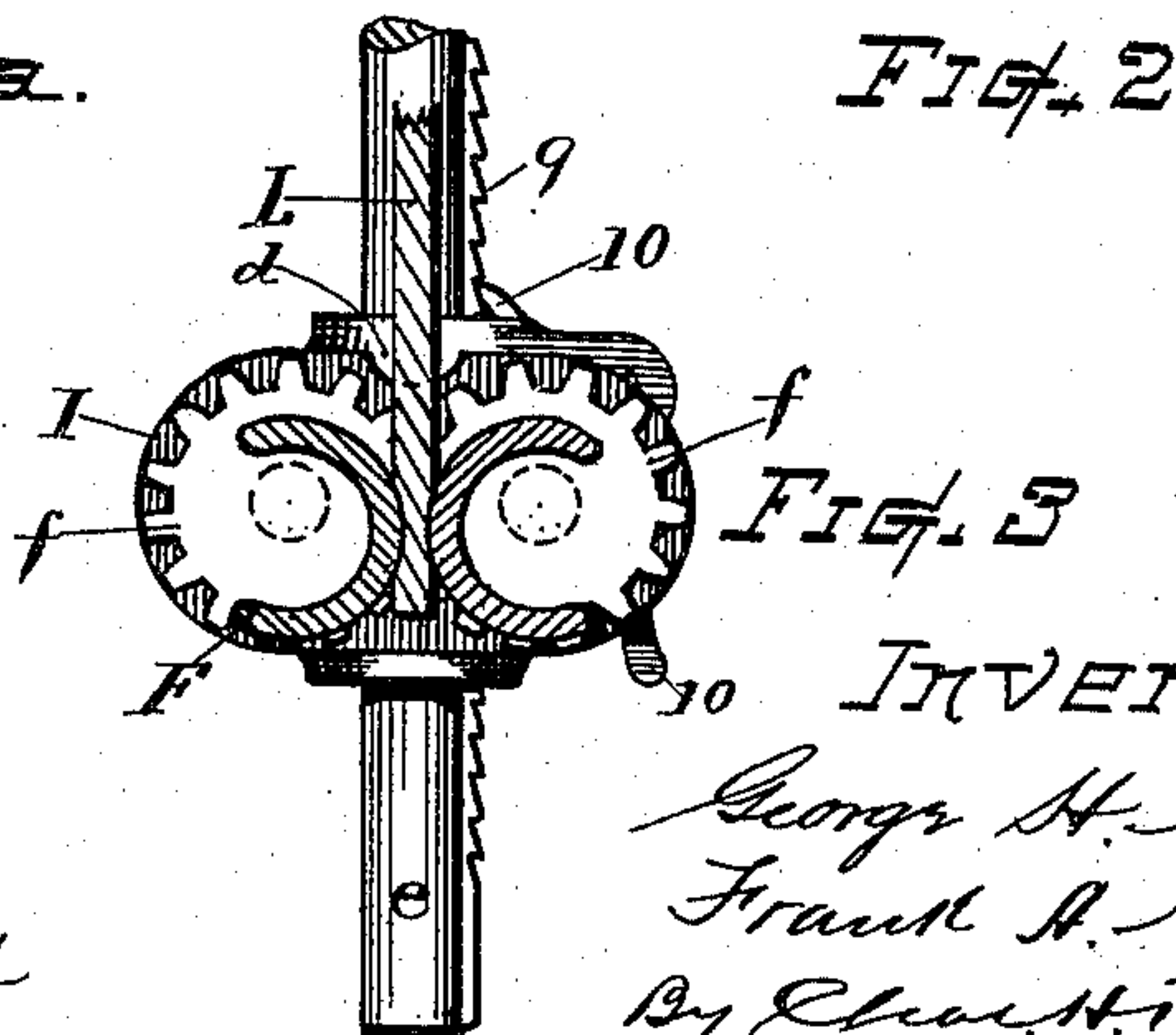
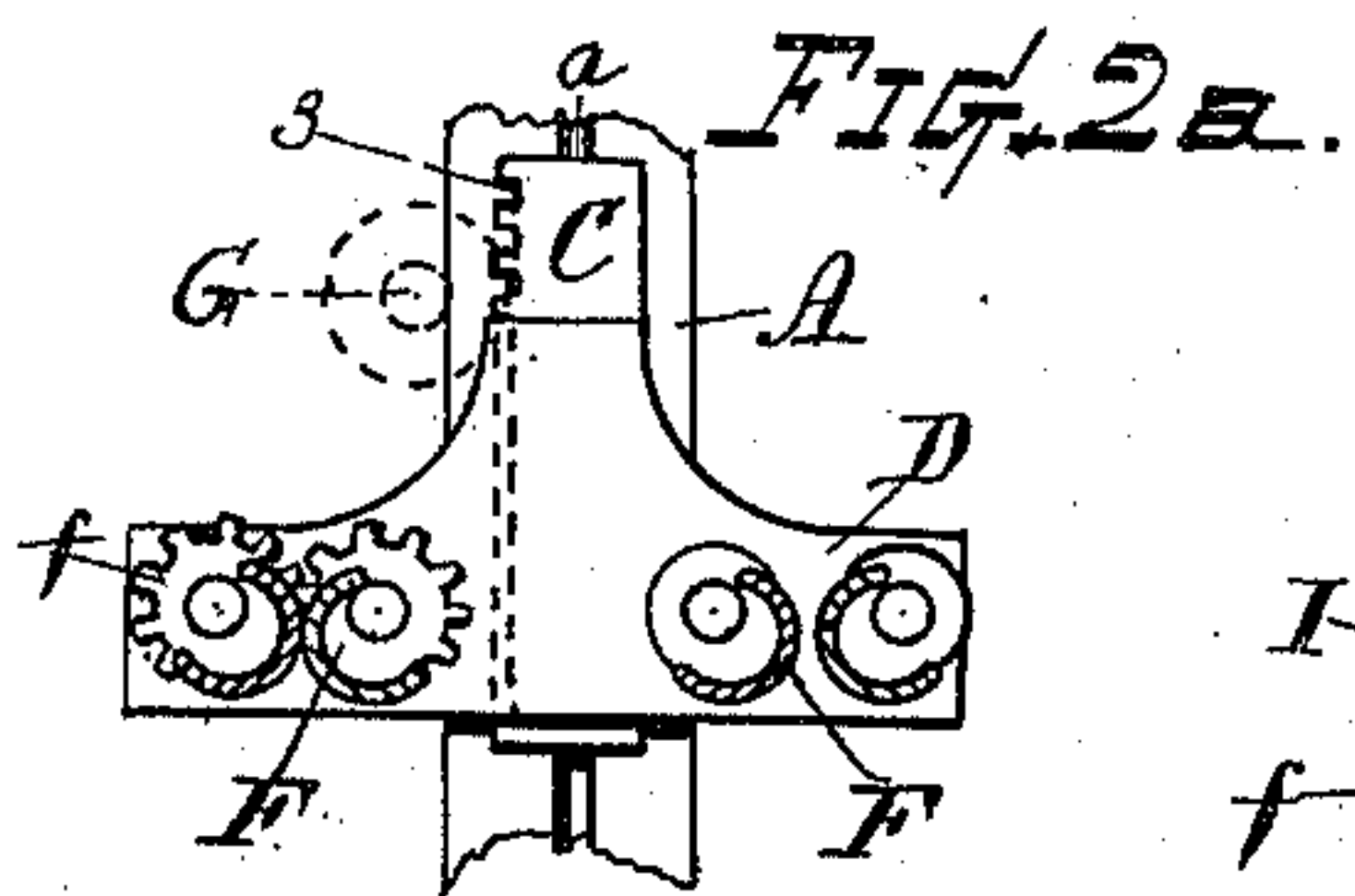
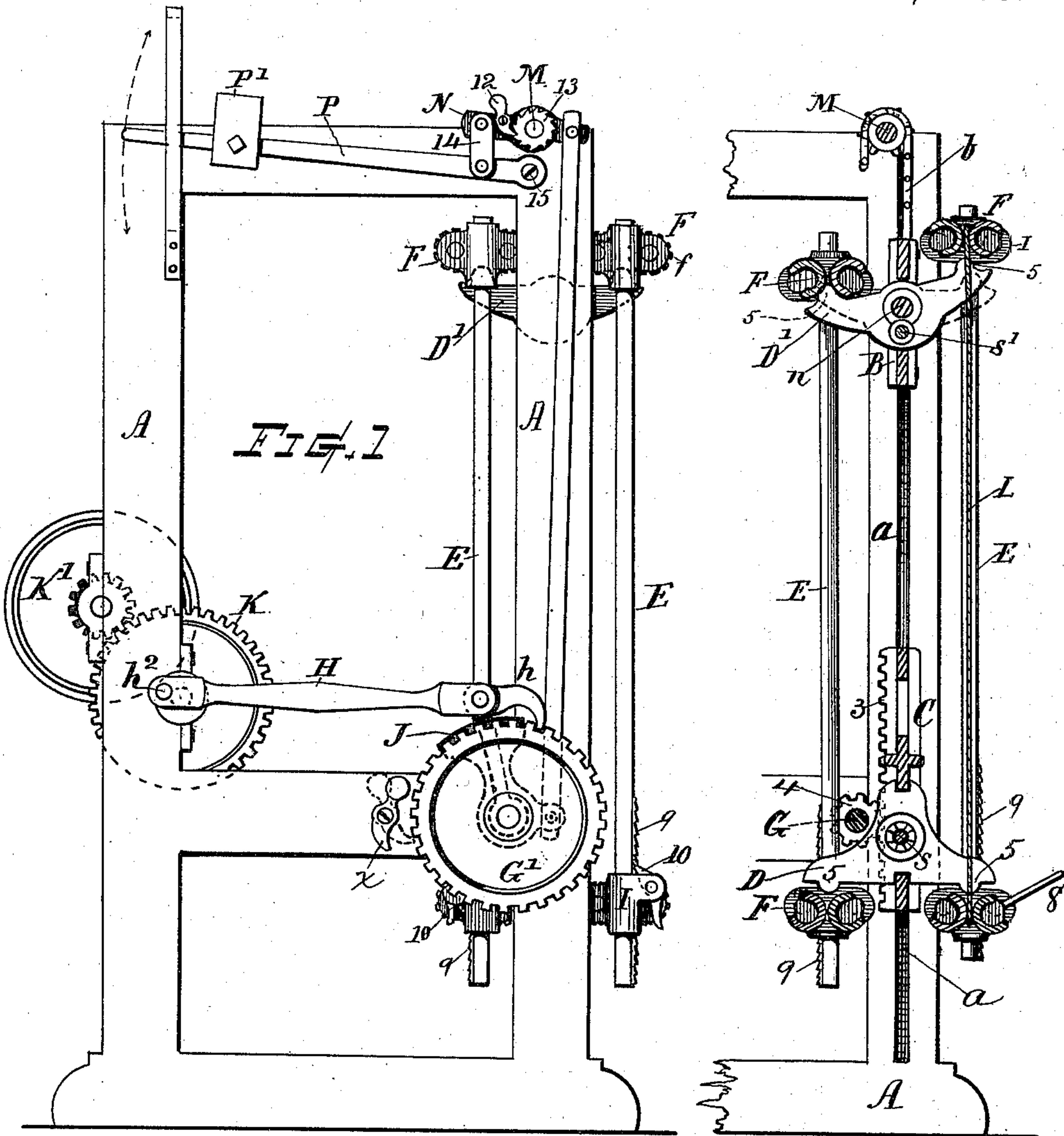
(No Model.)

2 Sheets—Sheet 1.

G. H. & F. A. NOBLE.
LEATHER STRETCHING MECHANISM.

No. 598,207.

Patented Feb. 1, 1898.



WITNESSES.

Charles A. Bacon
Ella P. Blinn

INVENTORS.

George H. Noble
Frank A. Noble
By Charles H. Durling
Attorney

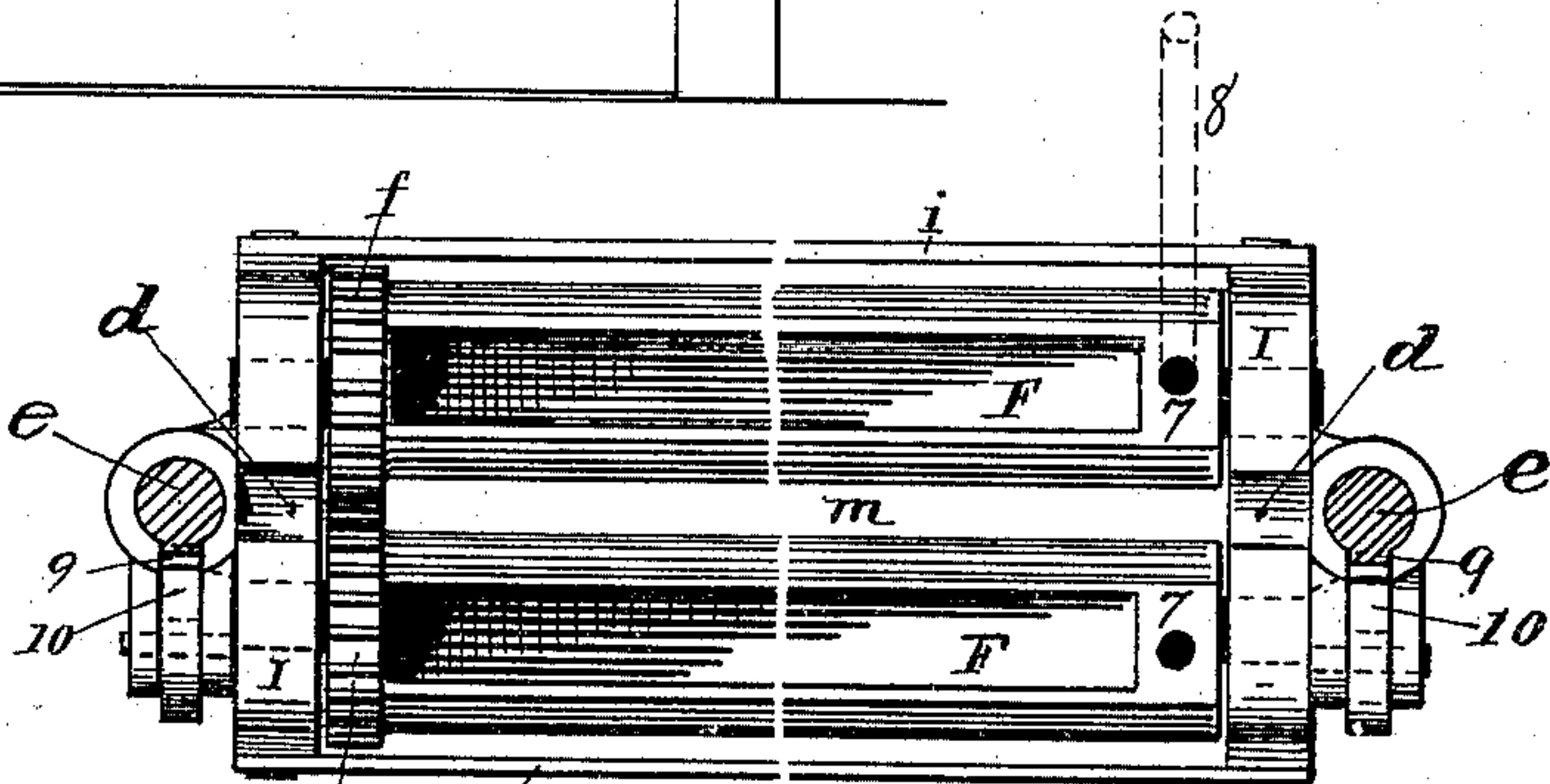
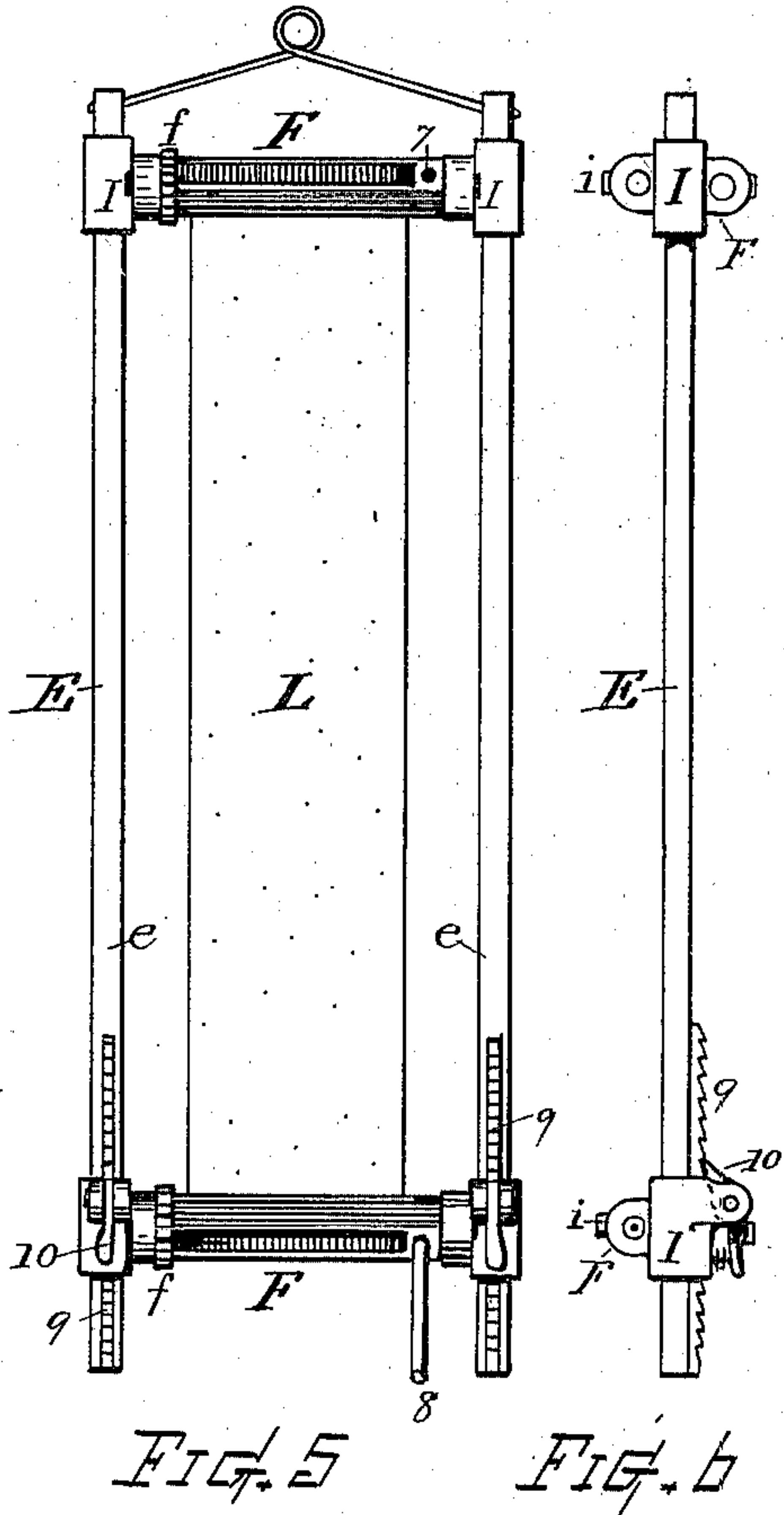
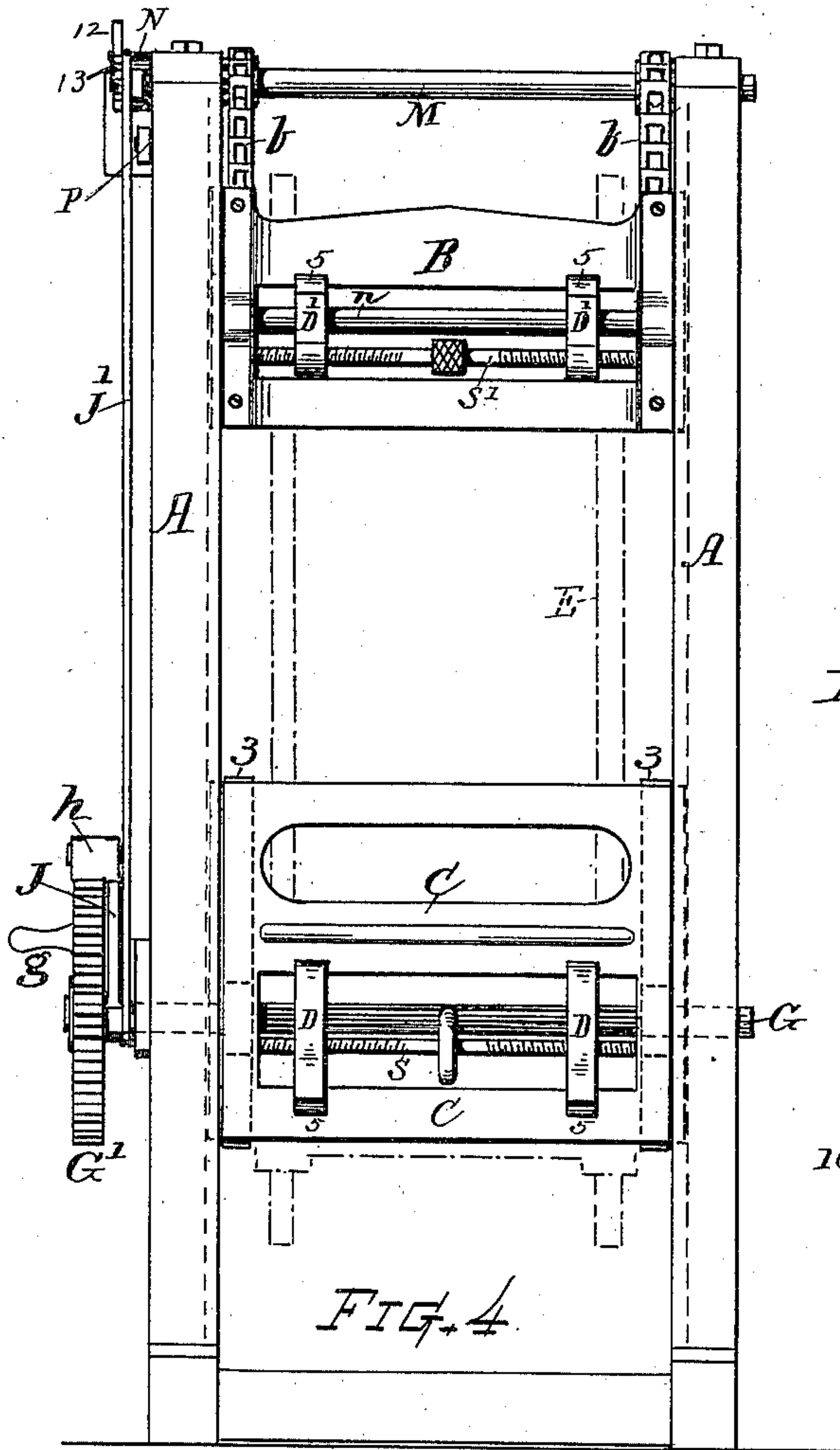
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Witnesses. f i
Charles A. Bacon
Ella P. Blum

FIG. 7

INVENTORS.

George H. Noble
Frank A. Noble
By Charles H. Burleigh
Attorney

UNITED STATES PATENT OFFICE.

GEORGE H. NOBLE AND FRANK A. NOBLE, OF WORCESTER, MASSACHUSETTS.

LEATHER-STRETCHING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 598,207, dated February 1, 1898.

Application filed August 2, 1897. Serial No. 646,805. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. NOBLE and FRANK A. NOBLE, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Leather-Stretching Mechanism, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

Our present invention relates to mechanism more especially designed and intended for stretching leather preparatory to its being worked into belting for machinery and in which strips of leather cut approximately the width for the required belts can be put under severe strain while wet and then allowed to dry in their stretched condition.

The objects of our invention are to afford a more practical and efficient mechanism for the purpose named and to provide an improved jaw or means for holding the end of the leather strip with a secure grip under varying strains and which can be quickly and conveniently manipulated for entering and releasing the leather into and from the same.

Another object is to provide a leather-stretching machine having stretcher devices provided with means for adjustment to accommodate different widths of belting or for operation with removable stretcher-racks of various sizes or widths.

Another object is to provide a leather-stretching machine with front and rear sets of jaw-supporting appliances and holding-jaws adapted for stretching two pieces of leather simultaneously; and also to afford facilities for equalizing the draft or overcoming variations in the elongation or increase in length of the two pieces operated upon.

Another object is to provide in a stretching-machine a yielding stretcher-head with means for regulating or limiting the amount of strain applied to the leather, and also to afford in connection therewith means for automatically controlling the action of the machine when the strain has reached the desired limit of tension.

These objects we attain by the mechanism illustrated, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a side view of a leather-stretching machine embodying our invention. Fig. 2 is a vertical section of the front portion of such machine. Fig. 2^a shows the jaw-support as made non-removable. Fig. 3 is a transverse section of our improved clamp or holding-jaws for leather-stretching machines. Fig. 4 is a front view of the machine with the racks out. Fig. 5 is a front view of the removable rack with leather therein. Fig. 6 is a side view of the same, and Fig. 7 is a plan section showing the detail of the holding-jaws.

Referring to the several parts and combinations in detail, A denotes the main frame, of suitable form and construction to properly support the working mechanism.

B and C indicate, respectively, the stretcher-head and jack-slide mounted in corresponding alinement in suitable guideways or grooves *a* on the front uprights of the frame A, so as to have movement toward and from each other. The jack-slide C is provided with gear-racks 3 at its sides, that engage with pinions 4, mounted upon a rotatable shaft G, arranged in bearings fixed on the frame adjacent to the guideway-standards. This jack-shaft G has a ratchet-wheel G' secured thereon, and for imparting motion thereto we employ a reciprocating rod H, carrying a hinged pawl *h*, that engages the ratchets. Said rod is best operated by a crank or eccentric *h*² and suitable driving mechanism, as the gears, shafts, and drive-pulleys shown at K K', or by other means. The pawl-hinge is supported by an arm that swings on the axis or hub, as indicated by dotted lines, Fig. 1. An adjustable swinging guard J is arranged for intervention beneath the pawl *h* to throw it out of action, as more fully hereinafter explained. The wheel G' is best furnished with a hand-crank *g*, and a stop-pawl *x* is arranged adjacent thereto for retaining the jack mechanism at position when the pawl *h* is thrown off.

The head B and jack-slide C are provided with carrier-arms, jaw-supports, or brackets D and D', that project therefrom in the present instance at both the front and rear sides. Said arms have thereon detents or bosses 5 for centering and supporting the leather-holding jaws F or stretcher-racks, as hereinafter explained.

E indicates a removable rack or stretching-

form comprising the upper and lower pairs of gripping-jaws *F*, and adapted to be adjusted upon the carrier-arms *D D'* for receiving the work and to be removed therefrom to facilitate the drying of the stock before its release from the stretched condition. These racks *E* are composed of side rods or bars *e*, having the end blocks *I*, that support the gripping-jaws *F*, arranged at the upper and lower ends of the side rods, forming a rectangular open structure adapted for holding the piece of leather *L*, as indicated in Figs. 5 and 6.

Our improved jaws consist of a pair of hollow semicylindrical or shell-shaped bars longitudinally straight and disposed parallel with each other and eccentrically journaled at both ends in the end blocks *I*, the two jaw-bars being connected or intermeshed with each other at one end (or both ends) by toothed gearing *f*, so that the two bars will have opposite rolling action in positive unison with each other, bringing the curved outer surfaces nearer together or farther apart on parallel lines at opposite sides of the central space *m*, accordingly as the jaw-bars are rocked in one direction or the other for gripping or releasing the leather across the entire width of the strip *L*. A transverse hole is formed in the jaw-bar for the insertion therein of a hand rod or lever *8*, by means of which the jaws can be closed or opened. The exterior surface of one of the jaw-bars in each pair is preferably fluted for insuring a more secure hold upon the leather. When gripped upon the leather, the holding power of the jaws increases as the pulling strain on the leather increases. The end blocks *I* may be connected together across the rack by tie-rods *i*, as indicated in Fig. 7, or in other suitable manner. The end blocks are fitted with recesses or depressions *d* to match the detents or bosses *5* on the carrier-arms *D D'*, so that they can be readily adjusted upon and securely supported in connection with said arms, as illustrated in Fig. 2.

In the preferred construction of the racks one set of jaws has its end blocks *I* rigidly secured to the side rods, while the other set of jaws has its end blocks combined with said side rods in a manner to slide thereon, said rods being provided with a row of outwardly-directed ratchets *9* and the end blocks provided with pivoted spring-pressed pawls *10*, that engage with said ratchets and normally prevent inward or contractile movement of the jaw-block, while allowing free outward or extension movement thereof. The pawls are provided with projecting tails adapted for pressure by the thumb for disengaging the point of the pawl from the ratchets when it is desired to adjust the jaw inward on the rods. (See Figs. 3, 5, and 6.)

The carrier-arms *D* and *D'* may be either fixed or movable in the head and jack-slide frames. In the present instance said carrier-arms are shown as arranged laterally adjustable, so as to accommodate racks *E* of vari-

ous widths, thus adapting the machine for different widths of belting. Shafts *s* and *s'* are fitted through the parts *D* and *D'* with right and left screw-threads for effecting an outward and inward lateral adjustment of said parts by rotation of said shafts. (See Fig. 4.)

The upper carrier-arms *D'* are best arranged to have tilting action on a central axis *n*, so as to be self-adjusting to accommodate any variation in the stretch of the two pieces of leather at front and rear of the head under a given tension or strain.

The head *B* is preferably suspended by chains or links *b b* from a rock-shaft *M*, arranged across the top of the frame, suitable sprockets or equivalent devices being fixed on said shaft for connecting the chain-links thereto. On the end of said shaft there is a head-plate *N*, carrying a pawl *12*, that engages a ratchet-wheel *13*, fixed to the shaft, the pawl holding the ratchet and shaft in opposition to the downward pull of the head *B*. One end of the rocking head *N* is joined by a link *14* to a swinging arm or lever *P*, fulcrumed on the frame at *15*, and hung upon said arm is an adjustable poise or weight *P'*. The other end of said rocking head *N* is connected by a rod *J'* with the swinging guard *J* of the jack-operating ratchet *G'*.

The operation is as follows: The pawl *h* is swung up from the wheel *G'*, and by means of the hand-crank *g* the jack-shaft *G* is turned backward, so as to elevate the slide *C*. The pawl *x* is then turned in to temporarily hold the parts in place while adjusting the work. The racks *E* being placed on the carriers *D D'*, the jaws *F* are opened by means of the lever *8*, the end of the leather *L* placed between, and the jaws closed thereon. When the two strips at front and rear of the stretching-jack have been placed in position, pawl *x* is thrown out and pawl *h* thrown into engagement and the driving mechanism started by shifting the belt to the tight pulley at *K'*. The reciprocation of the rod *H* and pawl *h* operates the jack-gearing and depresses the slide *C*, which by its carrier-arms *D* forces downward the lower sets of jaws and stretches the leather from the upper jaws. When the strain upon the head *B*, which carries the upper jaws, becomes so great that acting through the chains *b*, shaft *M*, and arm *P* it overcomes the resistance of the poise *P'*, the arm swings upward, allowing the shaft *M* and its plate *N* to rock forward as the head *B* is drawn down. This imparts movement to the rod *J'*, which causes the guard *J* to swing beneath the point of the pawl *h*, thereby stopping its effective action on the ratchet-wheel and thus relieving the jack mechanism from further stretching operation. The stretch which has been given to the leather is retained by the ratchet *9* and pawl device *10*, that connect the lower jaw-blocks with the side bars of the racks. Any variation in the stretch of the outer and inner strip is relieved by the tilting of the

upper carrier-arms D' on their axis *n*, as indicated in Fig. 3. The jack-shaft is next turned backward, raising the slide and thereby releasing the racks E, which, with the leather still held stretched therein, are taken from the machine and hung up or placed away to allow the leather to dry in stretched condition, and other racks are introduced into the machine and the operation repeated.

When the leather is dry or at any time as desired, it can be released from the rack-jaws or clamp F by turning back said jaws with the hand-lever 8.

The limit of yielding tension for the head B can be varied by adjusting the poise P' along its arm, or, if desired, the head may be fixed in its support by a positive stop, as a pin or dog arranged in suitable manner to prevent its movement in the main frame.

In some instances, as for stretching leather for very wide belting or where an extra large and powerful machine is required, it may be desired to have the machine single or without removable racks E. In such cases the jaws F can be journaled directly in the carriers, as indicated in Fig. 2^a—that is, in cheeks that form a rigid and permanent part of the stretcher-head B or jack-slide C.

Our improved leather-holding jaws F herein described can be applied or used in stretching-machines with operating mechanism of other form than that herein shown, and we desire to include such jaws when so used as within the scope of our invention.

We claim as of our invention and desire to secure by Letters Patent—

1. In a leather-stretching machine, the removable stretcher form or rack constructed as described, and composed of the parallel side rods and automatic grip holding-jaws disposed at the respective ends thereof; said jaws adapted for holding the leather in straight condition and stretched in a central plane coincident with the axes of said side rods; the end blocks having central seats for suspension on the machine, the blocks or bearings of one pair of jaws rigidly fixed to the rods, and the bearings of the other pair of jaws fitted to slide on said rods and provided each with a spring-pressed pawl pivoted in said bearing, its point adapted for engaging the outwardly-directed ratchets formed on the side rod, and having a thumb-tail for the release of the pawl; all substantially as and for the purposes set forth.

2. In a leather-stretching machine, the holding-jaws F consisting of a pair of opposite, longitudinally parallel, semicylindrical or transversely-curved bars, eccentrically journaled at both ends in non-yielding bearings common to the pair, and said bars connected or intermeshed by toothed gears adjacent to their ends, substantially as shown and for the purpose set forth.

3. In a leather-stretching machine, the combination with the stretcher head and jack mechanism, of a front set of holding-jaws

and a rear set of holding-jaws, and means for holding said sets of jaws respectively arranged and supported upon the stretcher-head and upon the movable slide of said jack mechanism at opposite or front and rear positions, for simultaneous action upon two separately-retained pieces of leather by one operation of the jack mechanism.

4. In a leather-stretching machine, the combination, with a stretcher head and jack slide mounted to work in guides on the supporting-frame, and provided with carriers or lugs adapted for seating jaws thereon; of the removable clamps or holding-jaws comprising the pairs of parallel transversely-curved bars eccentrically journaled in bearing-blocks, said bearing-blocks fitted with recesses or surfaces adapted to match said seat-lugs or carrier-surfaces on the head or jack-slide, and to receive working support for said jaws thereon during the stretching action, substantially as set forth.

5. The stretcher-head provided with tilting carrier-arms, in combination with the jack-slide, and leather-holding jaws at front and rear of said head and slide, for the purpose set forth.

6. In combination with the stretcher-head, the jack-slide, and detachable clamps or holding-jaws; the jaw-supports or carrier-arms laterally adjustable within said head and jack-slide, and adapted for sustaining said detachable jaws of various widths, and the right and left threaded screw-shaft or means for effecting adjustment of said carrier-arms, substantially as set forth.

7. In a leather-stretching machine, the combination with the stretching-jack and leather-holding jaws, of the movable jaw-supporting head, its suspending-links, the rocker-shaft supporting said head, the ratchet-connected plate on said shaft, the pivoted balance-arm connected therewith, and the poise or weight adjustable on said arm, for the purpose set forth.

8. In a leather-stretching machine, the combination, of the stretcher-jack C and jack-operating shaft provided with a ratchet-wheel G', the actuating-pawl *h* and the swinging guard-piece J, the stretcher-head B, the rocker-shaft M supporting said head, the shaft head-plate N, its connecting-ratchet 13 and pawl 12, the balance-arm P linked to said plate, and the rod J' connecting said plate with the swinging guard that controls the jack-actuating mechanism, and means for retaining the ends of the leather strip in connection with the stretcher head and jack, all substantially as and for the purpose set forth.

Witness our hands this 29th day of July, 1897.

GEORGE H. NOBLE.
FRANK A. NOBLE.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.