

(No Model.)

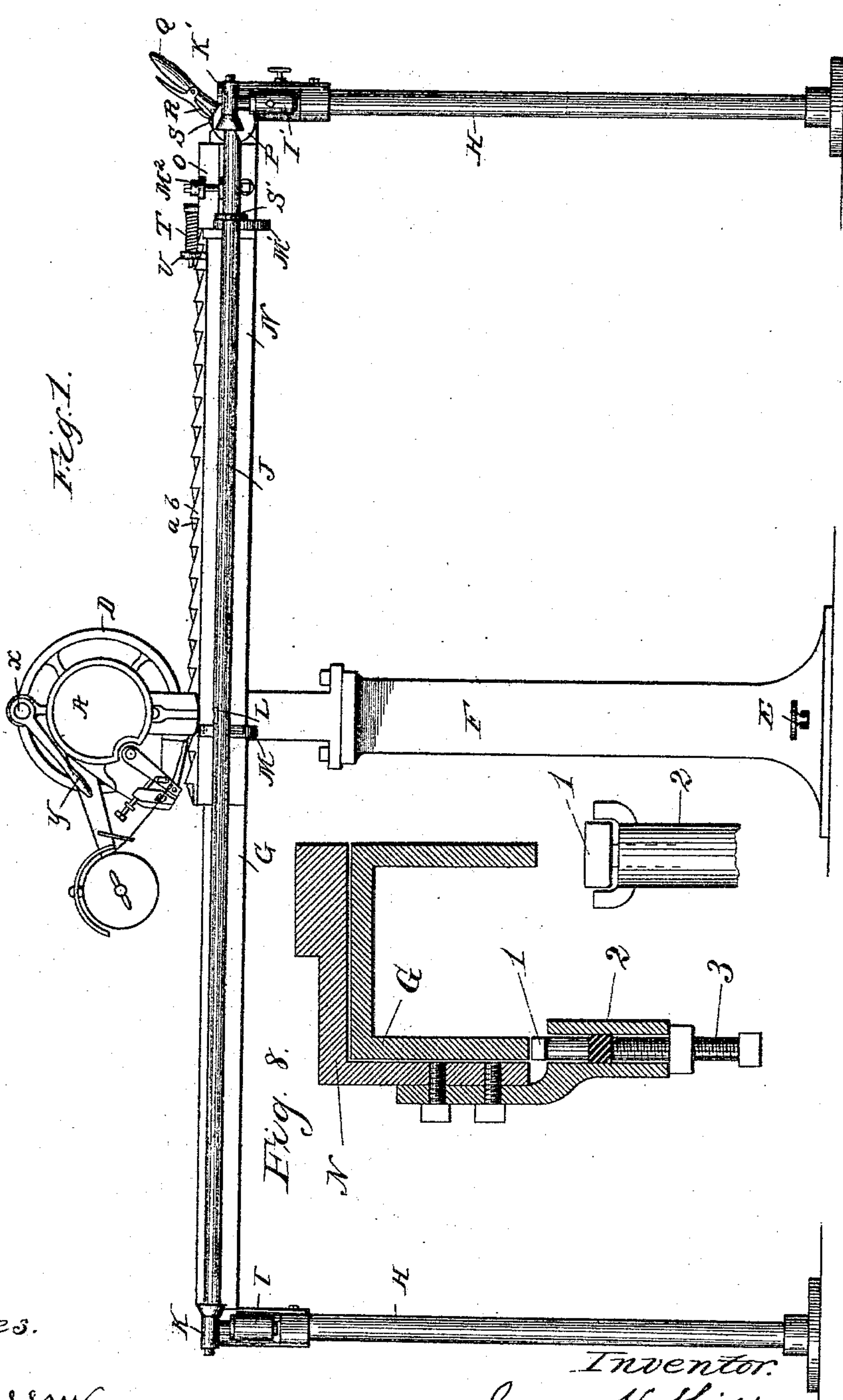
3 Sheets—Sheet 1.

J. H. SHIELDS.

MACHINE FOR STAPLING PIPE COVERINGS.

No. 412,129.

Patented Oct. 1, 1889.



Witnesses.
Wm. R. Rheim.
H. R. Brothman.

Inventor.
James H. Shields
By Jno. G. Elliott
att'y.

(No Model.)

3 Sheets—Sheet 2.

J. H. SHIELDS.

MACHINE FOR STAPLING PIPE COVERINGS.

No. 412,129.

Patented Oct. 1, 1889.

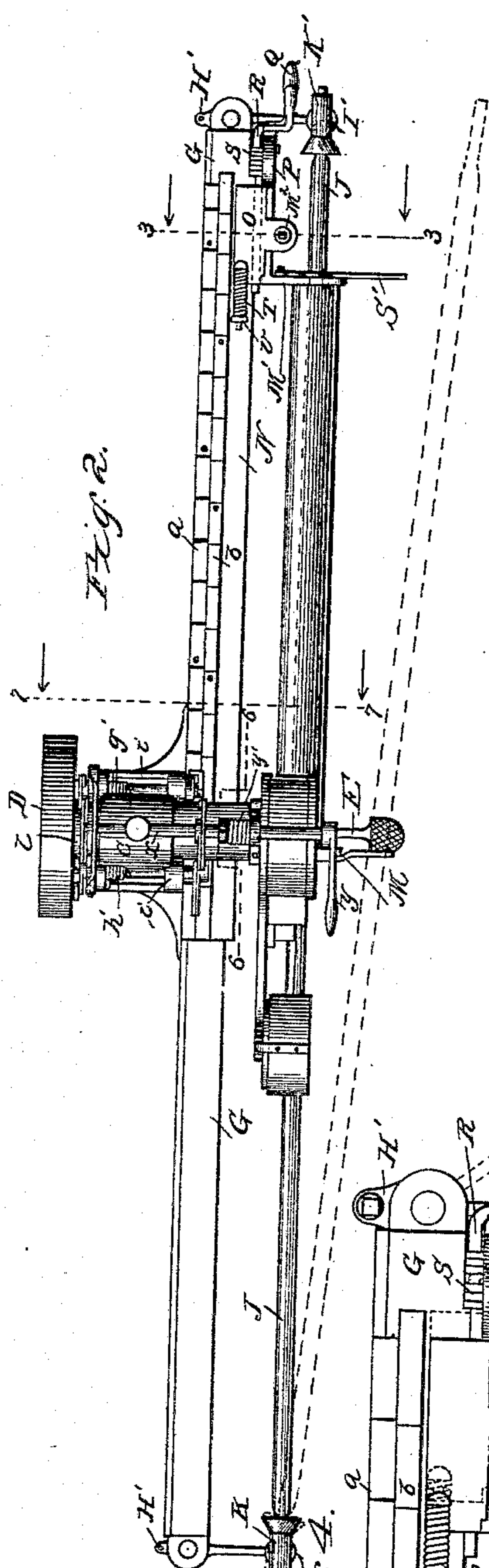


Fig. 2.

Fig. 3.

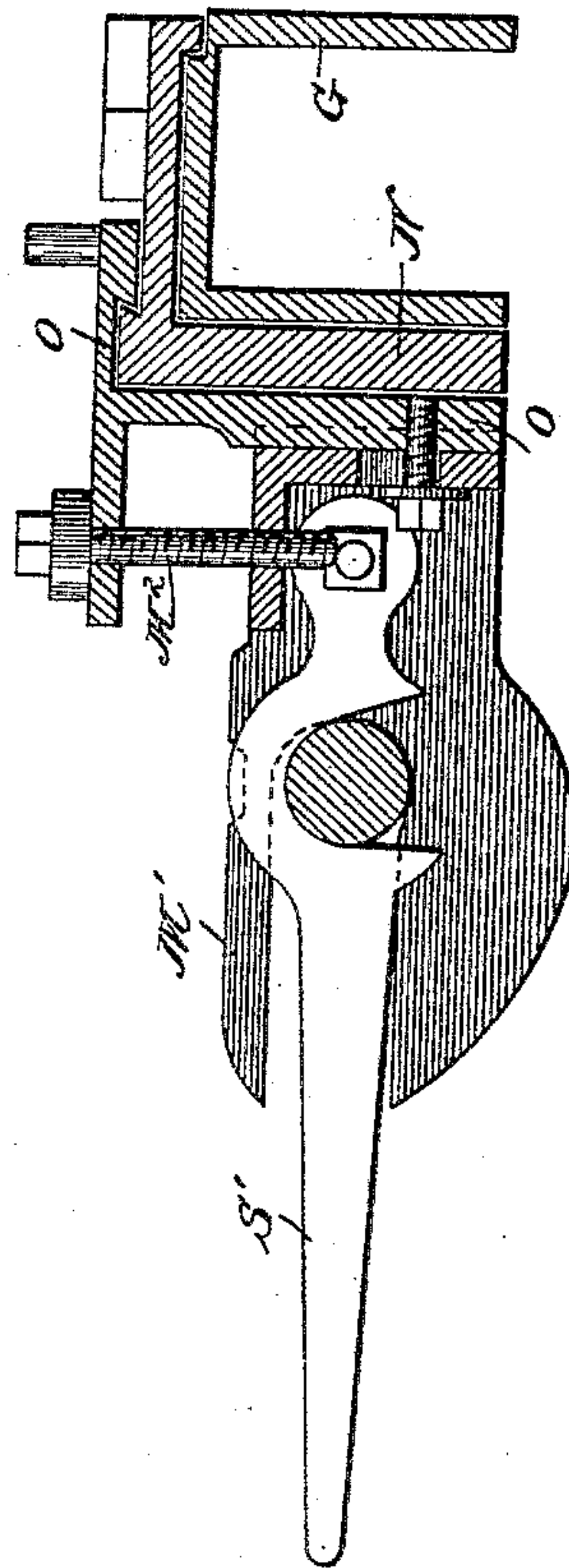
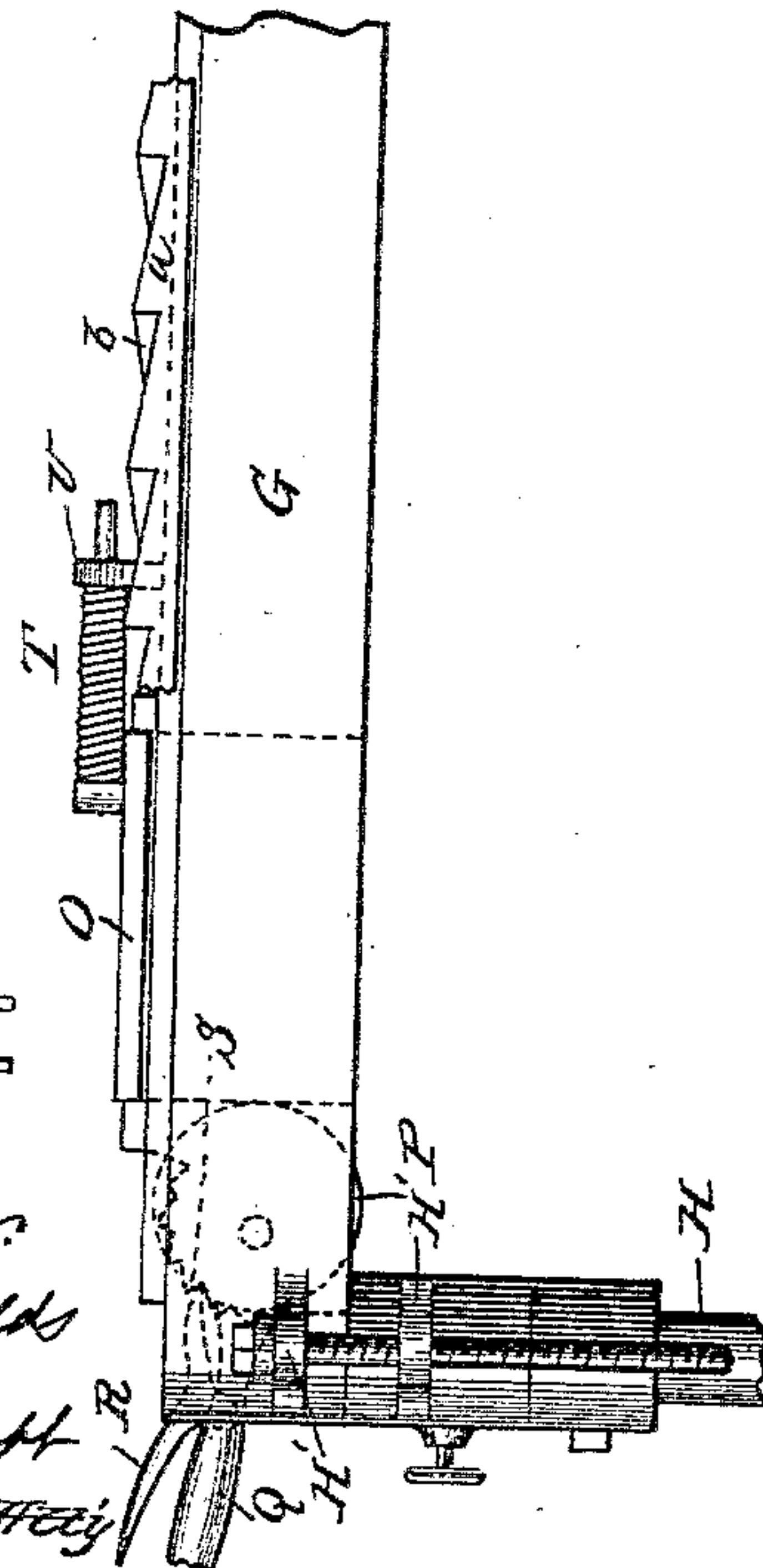


Fig. 5.



Witnesses.

Wm. J. Rheem.
H. R. Quokmudro.

Inventor.

James H. Shields

By Jno. S. Elliott

(No Model.)

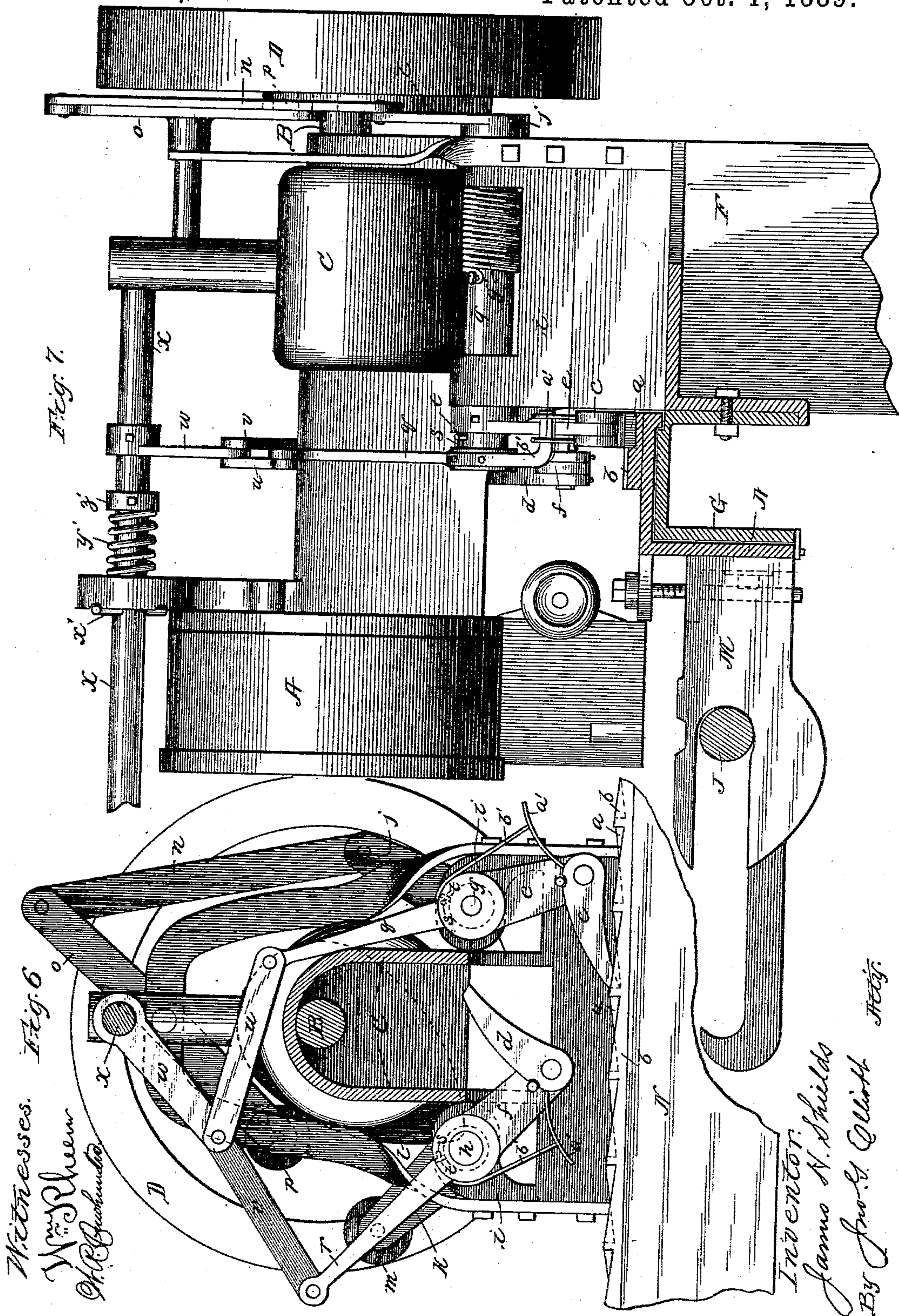
3 Sheets—Sheet 3.

J. H. SHIELDS.

MACHINE FOR STAPLING PIPE COVERINGS.

No. 412,129.

Patented Oct. 1, 1889.



Witnesses. *Fig. 6*
Wm. Cheam
Chas. B. Bunker

Fig. 7
Inventor.
James H. Shields
By Geo. E. Elliott

UNITED STATES PATENT OFFICE.

JAMES H. SHIELDS, OF CHICAGO, ILLINOIS.

MACHINE FOR STAPLING PIPE-COVERINGS.

SPECIFICATION forming part of Letters Patent No. 412,129, dated October 1, 1889.

Application filed November 19, 1888. Serial No. 291,224. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SHIELDS, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Stapling Pipe-Coverings, of which the following is a specification.

This invention relates to improvements in machines for uniting the adjacent edges of cylindrical pipe-coverings, which are generally composed of layers of paper or some fibrous, textile, or other flexible material, the meeting edges of which have heretofore been secured by fastenings of various kinds—such as pasted strips of fabric, by lacings, hooks and eyes, or hand-driven staples—all of which methods, however, are more or less objectionable because of the expense attendant upon the production of a necessarily-limited quantity and unsatisfactory, if not inferior, quality of work. My invention, however, relates more particularly to the devices for supporting the pipe-covering during the stapling operation, and is equally applicable to any form of wire stitching or stapling machines—that is, any form of machine adapted for forming and driving wire staples—the construction and operation of which form no part of my invention, excepting such operations thereof as necessarily co-operate with my devices; but for convenience of illustration I have shown my devices applied to a machine now upon the market, a general description of which will be sufficient for the purposes of this case.

The prime object of this invention is to economize in the fastening of pipe-coverings and effect the production of the maximum quantity at the minimum expense by enabling the fastening with wire-stapling machines.

Another object is to so support the covering while being stapled that it may be automatically and intermittently fed or advanced in the path of the stapling devices, whereby a fixed number of staples at a uniform distance apart may be inserted in the covering.

Another object is to have this automatic and intermittently-advancing support for the covering adjustable in such manner that the covering may be fed in either direction relative to the stapling devices and in the path thereof, whereby parallel rows of staples may

be driven without altering the position of the support.

A still further object is to maintain the covering in a fixed position relative to its support while being advanced thereby and during the stapling operation.

Other objects are to have the support of such a character that the movement thereof will be arrested immediately the impelling force ceases, to have the support adapted for operating upon coverings differing in diameter, and to provide certain details of construction in the carrying out of my invention, all as illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of a machine for stapling pipe-covering embodying my invention; Fig. 2, a plan view thereof; Fig. 3, an enlarged detail section on the line 3 3 of Fig. 2, looking in the direction indicated by the arrows; Fig. 4, an enlarged detail plan view of one end of the covering support and carriage, showing more clearly the mechanism for securing the covering in position while being operated upon; Fig. 5, a rear elevation thereof; Fig. 6, an enlarged detail vertical section on the line 6 6 of Fig. 2; Fig. 7, a transverse vertical section on the line 7 7 of Fig. 2, and Fig. 8, an enlarged detail section through the brake device for the support-carriage.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring first to the wire-stapling machine, which, as before stated, may be of any desired construction, the stapling devices thereof are concealed within the head A and preferably operated by the shaft B, journaled in the cast frame C of the machine, to which power may be applied by means of a belt-pulley D, loosely mounted upon the rear end of said shaft, the rotation of which is imparted at the will of the operator through the medium of a clutch device of some suitable character controlled by the foot-lever E, the latter being supported upon the standard F, or in any other convenient manner, such being the general construction and arrangement of the machine before referred to for the purpose of illustration.

Secured to the front of the standard, and

extending to either side thereof in a horizontal plane slightly below the head, is a frame or guideway G for the automatic carriage, heretofore described in detail, the ends of which guideway are preferably supported by posts or standards H, from the upper ends of which project forward arms I I', the latter of which has a pivotal connection with the post. Extending between these arms in a horizontal plane parallel with the guideway G and underlying the head A is a removable cylindrical bar J, constituting the direct support of the pipe-covering, and bearing in swivel-blocks K K', having pivotal support upon the arms I I', respectively, by which arrangement not only may the pipe-covering be slipped on and off at one end of the bar, preferably that toward the swivel-block K, by swinging the parts to the position shown in dotted lines in Fig. 4, but the said bar may be readily removed from the machine and substituted by another bar of greater or less diameter, according to the size of covering upon which it is designed to work.

By reference to Fig. 1 it will be observed that the bar J, immediately underlying the head A, containing the stapling devices, is recessed, as shown at L, which serves to clinch the ends of the staples in lieu of the regular bed of the machine provided for that purpose when other classes of material are to be operated upon. This bar is further supported near the center and toward one end thereof by arms M M', projecting from a carriage N. The central arm M' being elongated and upturned or hook-shaped at the outer end thereof, serves to furnish a guide or support for the bar when swung out into the position shown by dotted lines in Fig. 2 ready for reception of the section of pipe-covering.

It will of course be understood that the pipe-covering upon which this machine is designed to operate is manufactured in short lengths or sections and is designed to be confined upon the bar J between the arms M and M', the former of which is fixed upon the carriage N, while the latter is directly attached to the sliding block O, working upon the carriage and actuated by a cam P, pivoted directly to the carriage and provided with a hand-lever Q, having a spring-pawl R pivoted thereto and engaging a non-rotatable ratchet or segmental rack S, fixed upon the carriage and concentric with the axis of the pivot of the cam; hence when the covering is sleeved upon the bar and the latter thrown into its operative position, as shown by the dotted lines in Fig. 2, and locked by the drop-lever S, the depressing of the cam will cause the sliding block to advance along the carriage, carrying with it the arm M', which, bearing against the end of the pipe-covering, will clamp the latter firmly against the arm M, and when the lever is reversed a coil-spring T, sleeved upon the guide-rod and confined between said block and a lug U on the carriage, will cause the sliding block to retreat and thus release the covering.

From the foregoing description it will be readily understood that the bar J constitutes the direct support of and a guide for the pipe-covering during the stapling operation, and that the covering is slid and advanced along the bar past and in the path of the stapling devices by means of the carriage N, which is caused to be automatically and intermittently advanced in either direction by means of the devices now to be described, the intermittent advancement being for a fixed distance each time and the staples therefore inserted at a uniform distance apart. Along the top of the carriage are arranged two rack or toothed bars *a b*, lying parallel with each other, the teeth of which are preferably inclined in opposite directions in order that the carriage can be operated in one direction only by each set of teeth; but, if desired, ordinary square teeth may be employed and substantially the same result would follow. With these racks engage, respectively, pawls *c d*, opposing each other and pivoted to the lower ends of crank-arms *e* and *f*, fixed upon the ends of short shafts *g h*, journaled in a suitable frame or casting *i*, attached to the stapling-machine, said shafts lying at each side of the center of the machine and in a plane somewhat below the same. These shafts are caused to rock or oscillate in their bearings, so as to advance the pawls and thus operate the respective racks by means of crank-arms *j k*, attached to the opposite ends thereof, actuated by a cam *l*, fixed upon the shaft B between the belt-pulley and casing, with which the crank-arm *k* directly engages, having an anti-friction roller *m* on the outer end thereof for this purpose, while the arm *j* is indirectly actuated by the cam through the medium of a link *n*, attached at its ends, respectively, to said arm and to one end of a lever *o*, pivoted upon the casing, the opposite end of which carries an anti-friction roller *p*, engaging the cam. The shafts *g h* are actuated in the opposite direction, so as to retreat the pawls by means of springs *g' h'*, coiled upon the respective shafts attached at one end thereto and at their opposite ends to the casting *i*, or any other fixed portion of the machine, which springs also serve to maintain the anti-friction rollers *p m* in close relation with the cam when either of them is in its operative position.

The shaft *x* may be secured in either of its adjusted positions in any well-known and convenient manner, and as an illustration I have shown a simple form of device therefor, consisting of a transverse pin *x'* through said shaft, forced into recesses or depressions in the face of one of the shaft-bearings by means of a coil-spring *y'*, confined between the opposite face of said bearing and a coil *z'*, fixed on the shaft, which construction permits of the oscillation of the shaft from one operative position to the other without the necessity for manipulating any of the lock devices, it being obvious that only sufficient power need

be applied to overcome the force of the spring and ride the pin out of its sockets. It is intended, however, that only one of the pawls shall be in operative position at the same time, so as to actuate the carriage in one direction, and which, when the carriage reaches the end of its movement, will be thrown up out of its operative position and the other pawl simultaneously brought down into position for operating upon the other rack, so that when operated it will cause the carriage to travel back to its first position. To this end there is loosely mounted upon each of the shafts *g* *h* levers *q* *r*, having laterally-projecting pins *s*, adapted and arranged to engage radial pins *t*, projecting from the shafts *g* *h*, so that when the levers are forced downwardly, fulcruming upon said shaft, the pins thereon will engage the pins on the shafts and cause the same to oscillate upon their bearings, and not only lift the pawls clear of the racks, as shown in Fig. 6, but also move the crank-arms *j* *k* or their operating mechanism beyond the path of the revolving cam, so that the latter will have no effect upon the pawls so elevated. These levers at their opposite or upper ends are connected, respectively, by links *u* *v* with a crank-arm *w*, depending from a horizontal shaft *x*, located immediately above the main shaft *B*, to the forward end of which, as more clearly shown in Figs. 1 and 2, is attached a hand-lever or crank-arm *y*, by means of which the said shaft may be rocked or oscillated in its bearings; hence whenever the shaft is oscillated in one direction (see Fig. 6) the lever *q* will vibrate freely on the short shaft *g*, carrying the pin *s* with it, and simultaneously therewith the shaft *g*, by its spring *g'*, be caused to follow said lever and bring the pawl *c* down into position for engagement with the corresponding rack *a*, and the anti-friction roller *p* thereof brought into contact with and position for operation by the cam, while simultaneously therewith the shaft *h* will be oscillated in the opposite direction, elevating the pawl *d* clear of the rack *b*, and the anti-friction roller *m* thereof will be thrown out of the path of said cam. When the pawls are elevated out of their operative position, the free ends thereof are prevented from dropping by the rearwardly-projecting pins or arms *a'* engaging correspondingly-projecting arms or lugs on their respective crank-arms, or by any equivalent device for producing the same result, many of which will present themselves to the mind of a skilled mechanic. Obviously the oscillation of the shaft *x* in the opposite direction will cause a reversal of the position of all of these parts from that shown in Fig. 6 of the drawings, bringing the pawl *d* into an operative position and simultaneously elevating the pawl *c* out of the operative position, and hence the carriage may be caused at the will of the operator to travel intermittently in either direction during the continuous operation of the machine.

In operating upon coverings differing in diameter supporting-bars of different diameters are employed and the bearings of these bars are made adjustable upon the posts *H* by means of screw bolts or rods *H'*, working through suitable lugs upon said supports and posts, respectively, and the guides *M* *M'* are made correspondingly adjustable relative to the carriage by means of screw-bolts *M²*, as shown in Fig. 3, in order that the top or operating faces of the supporting-bars may always bear a fixed relation to the stapling devices—that is, remain at all times at a uniform distance therefrom, so that the staples may be properly driven and the ends clinched by the bar.

To prevent the carriage from sliding beyond the stroke of the pawls as a result of the impetus given to it by the pawls in their intermittent action, I employ a brake device similar to that shown in Fig. 8 of the drawings, in which is shown a cushioned or spring-seated brass or other metallic bearing-plate 1, guided and supported by a bracket 2, through which works a screw-bolt 3, bearing against the underside of the rubber cushion or spring in order to increase the tension thereof and thus cause the plate to bear with greater or less friction against the under side of the carriage-guideway *G*, which device acts as a brake upon the carriage and causes its forward movement to instantly cease when the pawl ceases its actuation thereof.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a supporting-bar underlying the stapling devices thereof and mechanism for automatically and intermittently advancing the covering along said bar past the stapling devices, substantially as described.

2. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a supporting-bar underlying the stapling devices thereof and mechanism for automatically and intermittently advancing the covering along said bar alternately in either direction relative to the stapling devices, substantially as described.

3. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a removable supporting-bar underlying the stapling devices thereof and mechanism for automatically and intermittently advancing the covering along said bar, substantially as described.

4. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a removable supporting-bar underlying the stapling devices thereof, vertically-adjustable bearings therefor, and mechanism for automatically and intermittently advancing the covering along said bar, substantially as described.

5. In a machine for stapling pipe-coverings,

the combination, with a wire-stapling machine, of a removable supporting-bar underlying the stapling devices thereof, a sliding carriage, a fixed arm and a movable arm projecting therefrom for holding the covering and supporting and guiding said bar, and mechanism for automatically and intermittently advancing said carriage, substantially as described.

6. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a removable supporting-bar underlying the stapling devices thereof, a sliding carriage, a fixed arm and a movable arm projecting from said carriage and supporting and guiding said bar, mechanism for actuating and locking said movable arm, and mechanism for automatically and intermittently advancing said carriage, substantially as described.

7. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a removable supporting-bar underlying the stapling devices thereof, adjustable bearings therefor, a sliding carriage, a laterally-fixed but vertically-adjustable and a laterally-movable and vertically-adjustable arm projecting therefrom and supporting and guiding said bar, mechanism for actuating and locking said movable arm, and mechanism for automatically and intermittently advancing said carriage, substantially as described.

8. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a supporting-bar underlying the stapling devices thereof, a sliding carriage, an arm projecting therefrom, a sliding block working on said carriage, an arm projecting therefrom opposing the arm on the carriage for holding the pipe-covering, a lever-cam pivoted to the carriage for actuating said block and a lock device therefor, and mechanism for causing said carriage to automatically and intermittently advance, substantially as described.

9. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, of a support for the covering, a carriage for advancing the covering along said support, having rack-bars thereon, pawls adapted to alternately and respectively engage said racks, spring-actuated shafts having crank-arms at each end thereof, one of which arms carries

the pawls, the main shaft of the stapling-machine, and a cam fixed thereon for actuating the other crank-arm, substantially as described.

10. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, a supporting-bar underlying the stapling devices thereof, and a carriage for advancing the covering along said bar, having racks *a b* thereon, of pawls *c d*, crank-arms *e f*, carrying said pawls, spring-actuated shafts *g h*, from which said crank-arms project, crank-arms *j k*, also projecting from said shafts, link *n*, lever *o*, cam *l*, anti-friction rollers *m p*, and mechanism for simultaneously oscillating the shafts *g h* in the same direction, so as to throw said pawls alternately in an operative position, substantially as described.

11. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, a supporting-bar underlying the stapling devices thereof, and a carriage for advancing the covering along said bar, having racks *a b* thereon, of pawls *c d*, crank-arms *e f*, carrying said pawls, spring-actuated shafts *g h*, from which said crank-arms project, crank-arms *j k*, also projecting from said shafts, link *n*, lever *o*, cam *l*, anti-friction rollers *m p*, levers *q r*, loosely mounted on said shafts, shaft *x*, crank-arm *w*, projecting therefrom, links *u v*, respectively connecting said levers with said crank-arm, a hand-lever for oscillating said shaft, and a lock device for holding the same in its adjusted positions, substantially as described.

12. In a machine for stapling pipe-coverings, the combination, with a wire-stapling machine, a supporting-bar underlying the stapling devices thereof, and a carriage for advancing the covering along said bar, having toothed racks fixed thereon, of a pair of pawls adapted and arranged to alternately and respectively engage said racks, and a revolving cam for alternately operating said pawls, substantially as described.

JAMES H. SHIELDS.

Witnesses:

W. R. OMOHUNDRO,
A. M. BENNETT.