

No. 673,408.

Patented May 7, 1901.

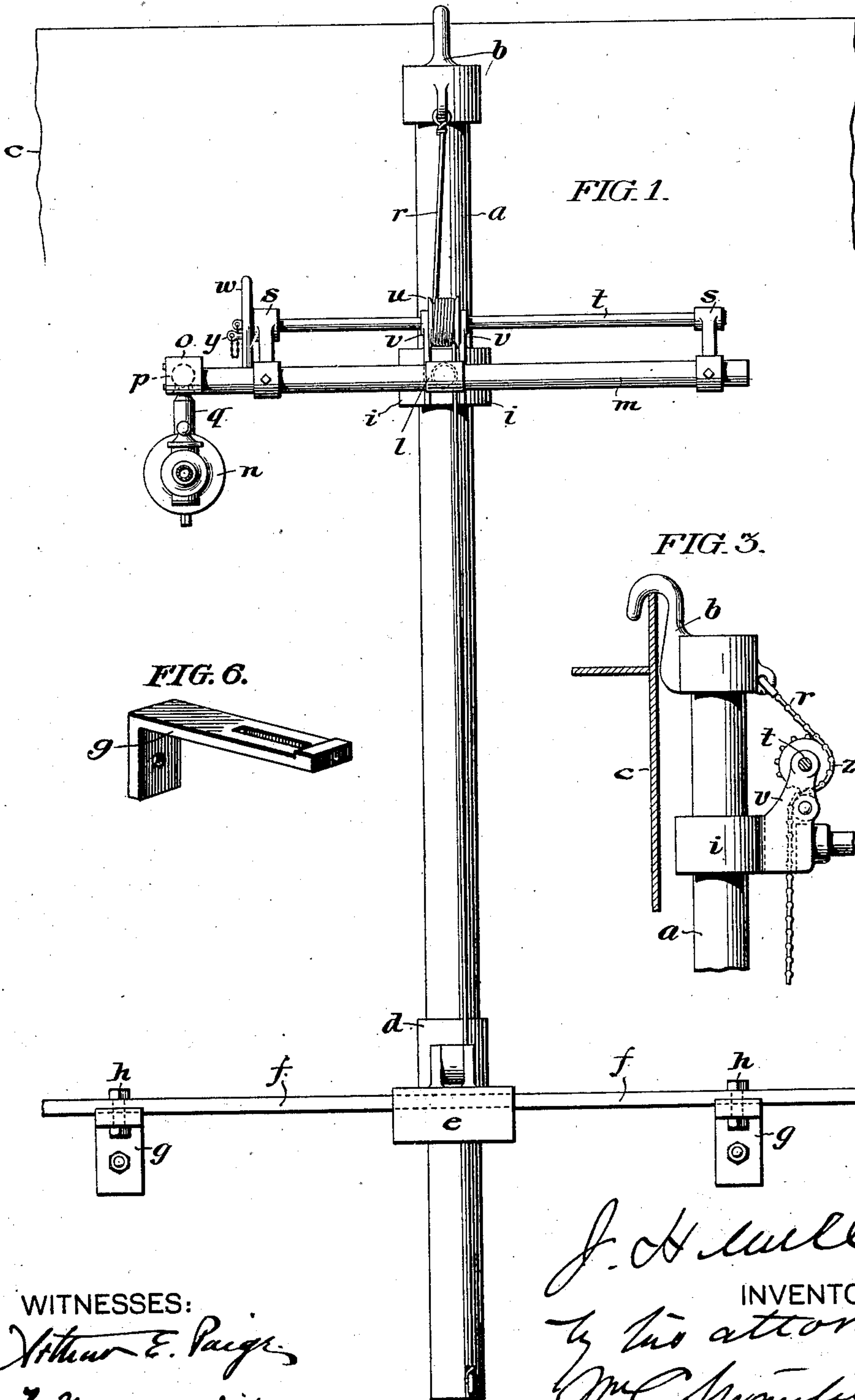
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APPARATUS FOR SUPPORTING RIVETING TOOLS.

(Application filed Mar. 27, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:  
Arthur E. Paige  
J. Norman Dixon

J. H. Mull  
INVENTOR:  
by two attorneys  
McMinn & Co.

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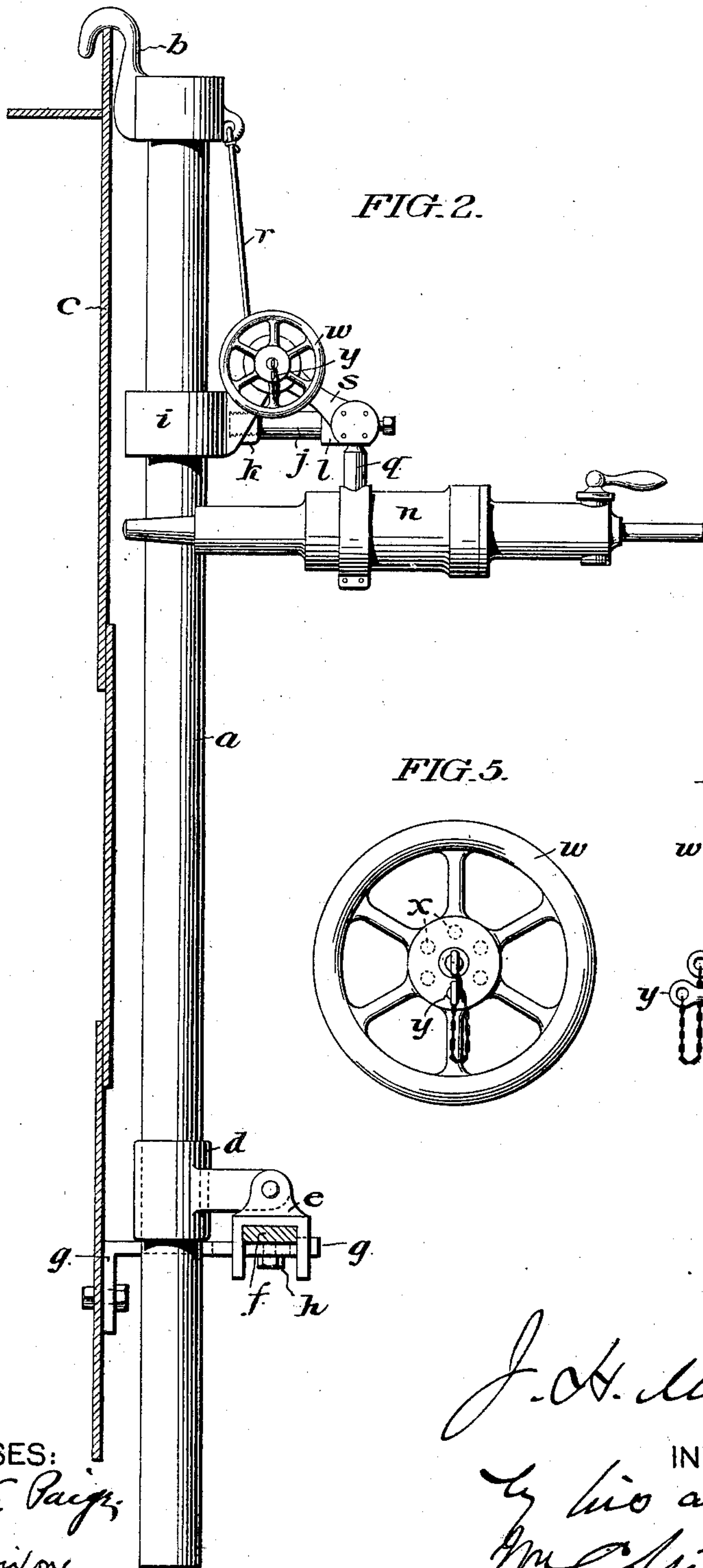
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WITNESSES:  
*Arthur E. Paige*  
*F. Norman Dixon*

*J. H. Mull*  
INVENTOR:  
*by his attorney*  
*McManis*



# UNITED STATES PATENT OFFICE.

JAMES HENRY MULL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
THE PNEUMATIC TOOL IMPROVEMENT COMPANY, OF SAME PLACE AND  
CAMDEN, NEW JERSEY.

## APPARATUS FOR SUPPORTING RIVETING-TOOLS.

SPECIFICATION forming part of Letters Patent No. 673,408, dated May 7, 1901.

Application filed March 27, 1900. Serial No. 10,333. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES HENRY MULL, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Riveting Apparatus, of which the following is a specification.

My improvements relate to supporting apparatus designed to be located on or in the vicinity of hulls of vessels, tanks, and kindred structures to serve as carriers for riveting or kindred vibratory power operated machines, and by manipulation or adjustment of which supporting apparatus a supported machine may be quickly and easily shifted from point to point within a given range,—and which apparatus may, after the machine has operated at all the required points within the range of movement of the parts, be moved bodily to another portion of the structure, so that the machine may be caused to operate upon the parts thereof not within reach with the apparatus in its first position.

In the accompanying drawings I show, and herein I describe, a good form of a convenient embodiment of my invention, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the accompanying drawings,

Figure 1 is a view in front elevation of an apparatus embodying a good form of my invention.

Figure 2 is a view in side elevation of an apparatus substantially the same as that shown in Figure 1.

Figure 3 is a fragmentary view in side elevation of an apparatus constituting a modified embodiment of my invention.

Figure 4 is a detail sectional view of a locking device.

Figure 5 is a face view of the hand wheel and the locking device.

Fig. 6, is a view in perspective of the bracket *g*.

Similar letters of reference indicate corresponding parts.

In the drawings,

*a* is what I term a supporting rail or mast,

located in any desired position or inclination with relation to the structure on which the machine which it carries is designed to operate.

In the drawings I show such rail or mast as supported in a vertical position by means of a hook or claw *b* at its upper end, engaged upon the upper edge of the structure *c* upon rivets in which the supported riveting machine is assumed to operate.

The lower end of the rail or mast is shown as provided with a collar *d* projecting from which is an arm to the outer end of which is pivotally connected a guide block *e* having a recess in its under face.

*f* is a horizontally disposed guide bar supported as to its respective ends upon brackets *g* secured to the structure *c*, outwardly extending arms of which brackets are provided each with a longitudinally extending slot.

*h h* are bolts one of which is mounted in each of said slots and passed through the adjacent end portion of the guide bar *f*.

By virtue of the arrangement described the guide bar *f* may be moved upon the brackets toward or from the structure *c* for a distance measured by the length of the slots in said brackets, and may by tightening up the nuts on the bolts *h* be secured in such position.

The guide block *e* straddles or receives said guide bar in its depression, and by its engagement with said guide bar, maintains the rail or mast *a* in predetermined relation with respect to the structure *c*.

Manifestly when the structure *c*, in connection with which my apparatus is employed, is not vertical, but is inclined in one direction or the other, the tendency of the mast to hang in a vertical position would cause the lower end of the mast to swing away from the lower part of the structure or else make contact with said structure, according to the inclination of the latter.

By means of the brackets and associated parts just described, however, the guide bar can be moved in and out along the brackets such distances as will compensate for any



curvature or inclination of the structure *c*, so that the lower end of the mast may be maintained at the same distance from the lower part of the structure as the upper part of the mast is from the upper part of the structure.

Manifestly the mast and the devices which it supports may be freely shifted bodily to the right or left a distance limited by the brackets *g*.

*i* is a traveler, being in the form shown an annulus encircling the rail or mast *a*, and adapted to have longitudinal and also rotative movement with respect to said mast.

Said traveler is, in the form of my apparatus shown, provided with a stud *j* the inner end of which is entered in a boss *k* projecting from the front of the traveler *i*.

The outer end of said stud is provided with a head *l* having a cylindric transverse opening.

*m* is a carrier bar, as I term it, happening in the form shown to be a cylindric bar extending through the cylindric opening in the head *l*, snugly fitting said opening and adapted for longitudinal movement through it as a slide bearing.

*n* is a power operated riveting machine connected by a universal joint to the carrier bar. Any preferred character of universal joint may be resorted to provided it affords the required flexibility to enable the machine to be properly manipulated with relation to the rivet operated upon.

In the form shown in the drawings the carrier bar or arm *m* is provided with an enlargement *o* in which is formed a spherical recess opening through the lower face of said enlargement.

*q* is a suspending link or hanger attached to the riveting machine and having a ball *p* at its upper end (Figure 1) engaged in the spherical recess, said ball and recess forming a ball and socket joint constituting the universal joint above referred to.

The especial object of my invention is to provide means for positively advancing the traveler, carrier bar, and associated parts, or such of these devices as may be employed, along the rail or mast.

I prefer to do this by attaching a chain, rope, or other flexible connection, *r* to a suitable eye or other fixed point of attachment in the vicinity of the upper end of the mast, and engaging the body of the said flexible connection upon a suitable drum or wheel connected with the traveler or carrier arm.

In the drawings *s s* are a pair of brackets mounted upon the respective ends of the carrier bar and serving to support a drum shaft *t* upon which is keyed a winding drum *u* confined against endwise movement by a pair of lugs or ears *v* erected from the body of the traveler, presenting against the respective ends of the drum, and incidentally encircling the shaft *t*.

An operating hand wheel *w* is mounted on

that end of the shaft adjacent to the riveting machine.

To secure the drum in position when the movable parts have been brought to the desired adjustment, I prefer to provide the wheel *w* with a suitable aperture adapted to register with a concentric series of apertures *x* formed in the outer face of the adjacent bracket *s* as shown particularly in Figure 4.

A locking pin *y* (Figures 4 and 5) passing through the opening in the hand wheel and engaged in any one of the openings *x* will lock said wheel and its shaft, and consequently the winding drum *u*, fast in whatever position they happen to be when said pin is inserted.

In the form of apparatus shown in Figure 1, the flexible connection *r* after passing around the winding drum a number of times extends down to a point in the vicinity of the foot of the mast and is made fast to any suitable keeper or fixed point of attachment.

In the arrangement shown in Figure 2 the flexible connection is except for that part of it between the drum and the upper end of the mast, all wrapped around the winding drum.

In the construction shown in Figure 1 rotation of the hand wheel *w*, occasioning the rotation of the drum *u*, will take up the rope on one side and pay it out on the other, thus positively advancing the traveler and its connected parts to one end or the other of the rail or mast according to the direction of such rotation.

In the form shown in Figure 2, the rotation of the hand wheel *w* in one direction will cause the winding of the flexible connection on the drum and consequently occasion the positive movement forward of the traveler and connected parts.

Rotation of said wheel in the opposite direction will pay out the flexible connection *r*, whereupon the traveler and its connected parts will descend the rail or mast by force or gravity.

In the construction described, the carrier bar may be shifted as described through the head *l* to the right or left to carry the riveting machine horizontally toward or away from the rail or mast, the shaft *t* of course sliding through the winding drum.

The movement of the carrier arm through its bearing is accomplished by the operator in charge of the machine *n*, who moving said machine toward and away from the rail or mast, occasions the corresponding sliding movement of the carrier arm which "follows," so to speak, said machine.

By virtue of the arrangement hereinbefore described, the traveler, its carrier arm, and connected parts, may be all together very conveniently and easily moved positively along the mast so that the riveting machine may, in addition to the right and left movement due to the shifting of the carrier arm through the head *l*, be moved in a direction in par-



allelism with the rail or mast to any point desired within the range of the apparatus.

By reason of the transverse movement of the carrier arm through the head *l* and by reason of the movement of the parts along the mast the machine may be carried to a position to operate upon any rivet within a given area determined by the dimensions of the parts.

10 In addition to the transverse movement of the carrier arm through its bearing, the mast as a whole, and all the parts supported by it, may be bodily shifted as hereinbefore explained to the right or left a distance determined by the length of the guide bar *f*.

15 The location of the wheel *w* in the vicinity of the riveting machine, enables the operator to occasion the positive movement of the apparatus along the mast without leaving his position by the machine.

20 In the modified form of my invention shown in Figure 3 I dispense with the drum *u* and employ instead a sprocket chain wheel *z* keyed on the shaft *t*.

25 The flexible connection will of course in this arrangement have links to correspond with the teeth of said wheel *z*, and the lower end of the flexible connection may hang free or may be made fast as desired.

30 Having thus described my invention, I claim—

1. A riveting apparatus, including, in combination, a carrier arm or bar, a riveting machine connected to said bar by a universal or flexible joint, a rail or mast, a connection between said bar and said rail or mast, a winding drum mounted on a shaft supported from said carrier arm, a flexible connection engaged with said drum and connected to a relatively fixed distant support and a hand wheel on said shaft, substantially as set forth.

2. A riveting apparatus, including, in combination, a carrier arm or bar, a riveting machine connected to said bar by a universal joint, a rail or mast, a connection between said bar and said rail or mast, a winding drum mounted on a shaft supported in parallelism with said carrier arm, a hand wheel on said

shaft, and means for locking said drum in various positions of rotation, substantially as set forth.

3. A riveting apparatus, including, in combination, a mast or rail, the traveler, the carrier bar mounted on said traveler and free for longitudinal movement in the direction of its own axis, a riveting machine secured to said carrier bar, a shaft mounted in suitable bearings erected from said bar, a drum keyed upon said shaft, and a flexible connection engaged with said drum and secured to the upper end of the mast, substantially as set forth.

4. A riveting apparatus, including, in combination, a mast or rail, the traveler, the carrier bar mounted on said traveler and free for longitudinal movement in the direction of its own axis, a riveting machine secured to said carrier bar, a shaft mounted in suitable bearings erected from said bar, a drum keyed upon said shaft, a flexible connection engaged with said drum and secured to the upper end of the mast, means for locking said drum in various rotative positions, substantially as set forth.

5. A riveting apparatus, including, in combination, a rail or mast, means for adjustably connecting a riveting machine through suitable intermediate mechanism to said mast, a support for the upper end of the mast, a guide block secured to the lower portion of the mast and engaged with a transversely extending guide bar, projecting brackets, detachably secured upon the structure upon which the apparatus is at work, said brackets each including a longitudinally extending slot, and bolts engaged in said slots and in the respective ends of the guide bar, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 21st day of March, A. D. 1900.

JAMES HENRY MULL.

In presence of—

F. NORMAN DIXON,  
THOS. K. LANCASTER.