

No. 750,477.

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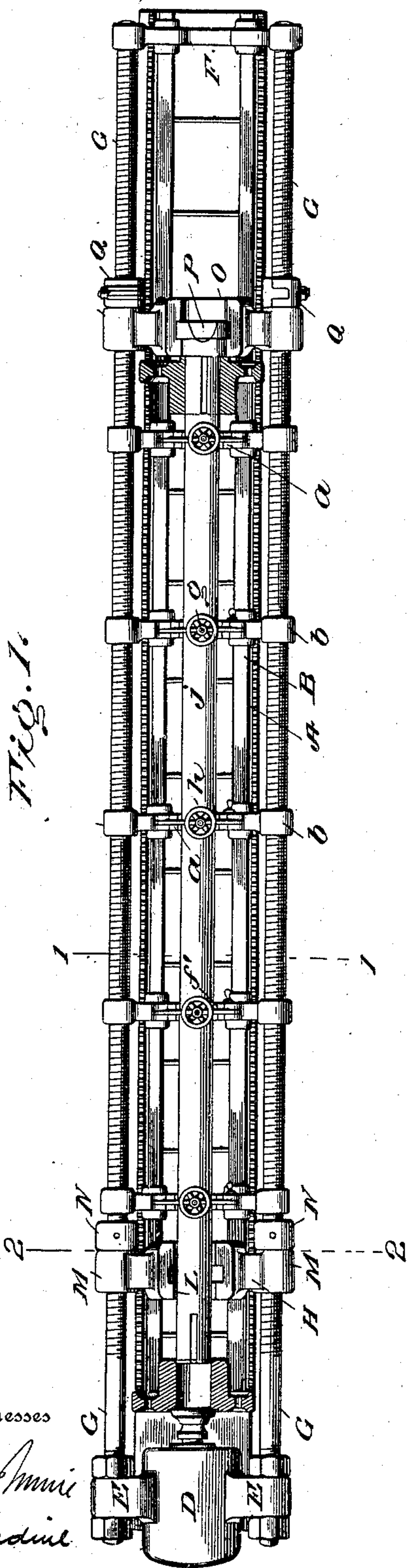
W. J. MUNCASTER.

APPARATUS FOR APPLYING COUPLINGS TO AND REMOVING COUPLINGS FROM SHAFTING.

APPLICATION FILED JAN. 25, 1902.

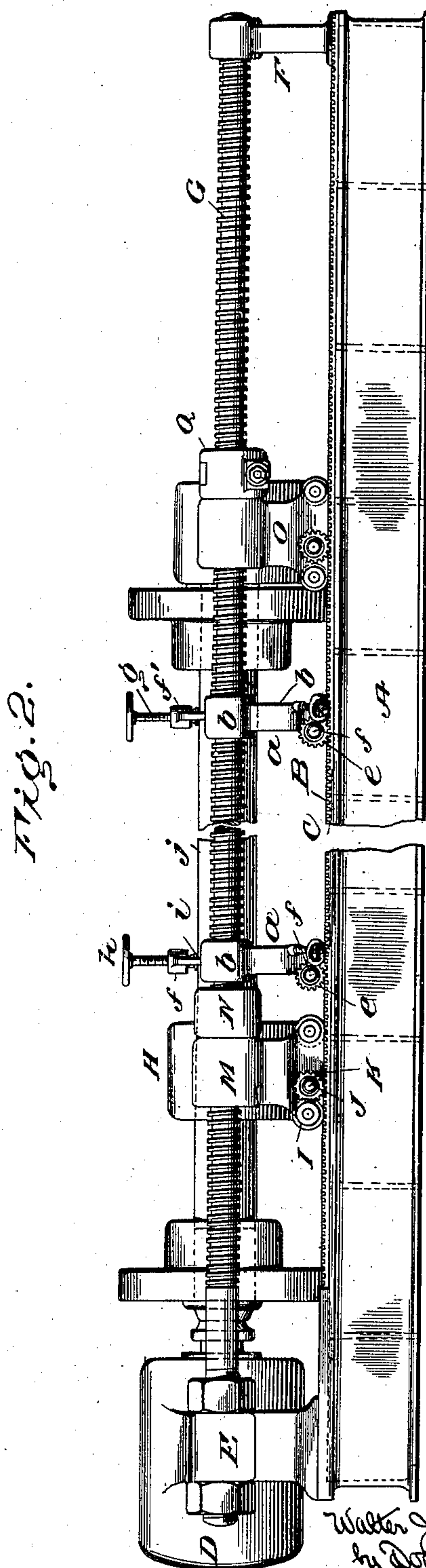
NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

Geo Annie
 D. Curdine



Inventor

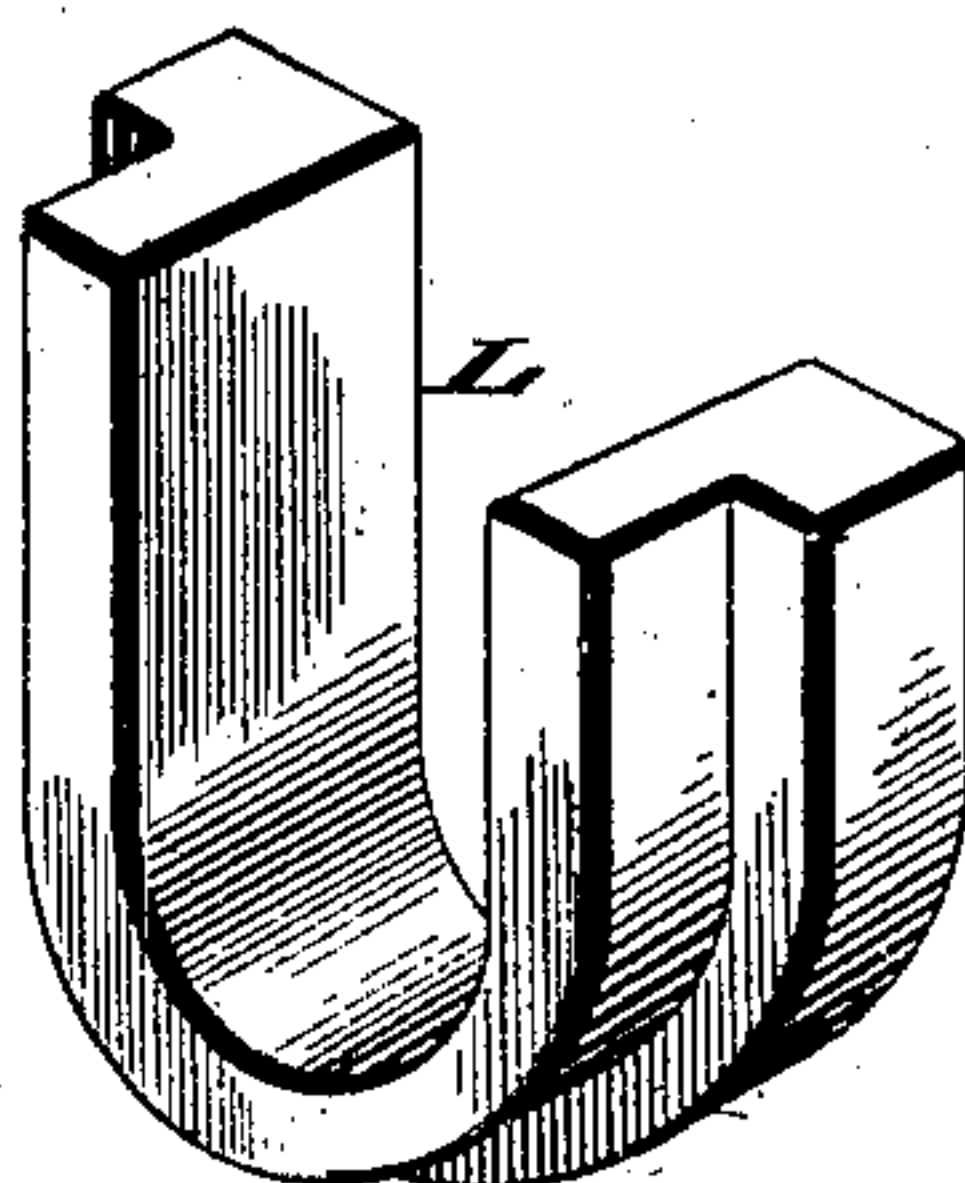
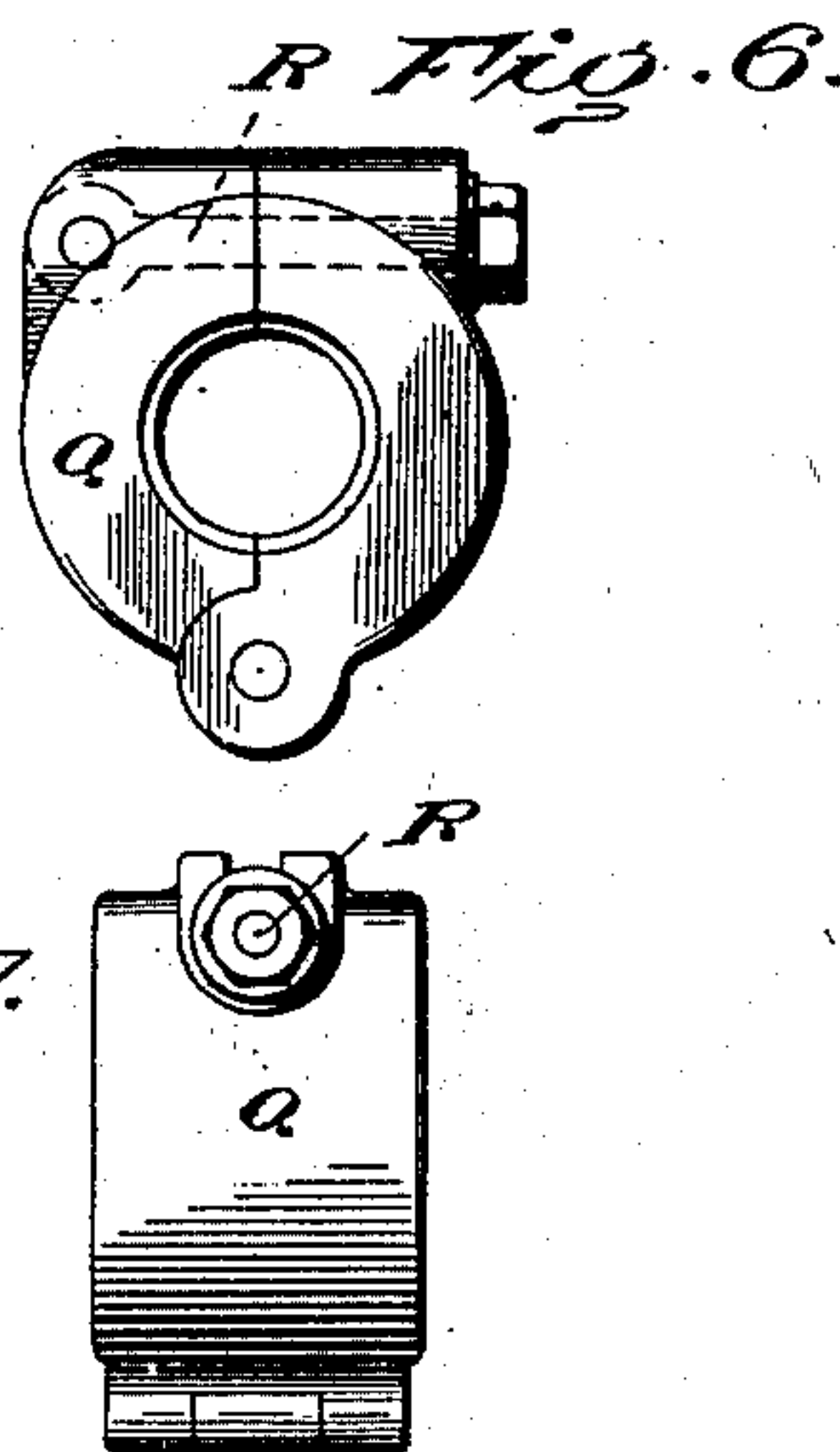
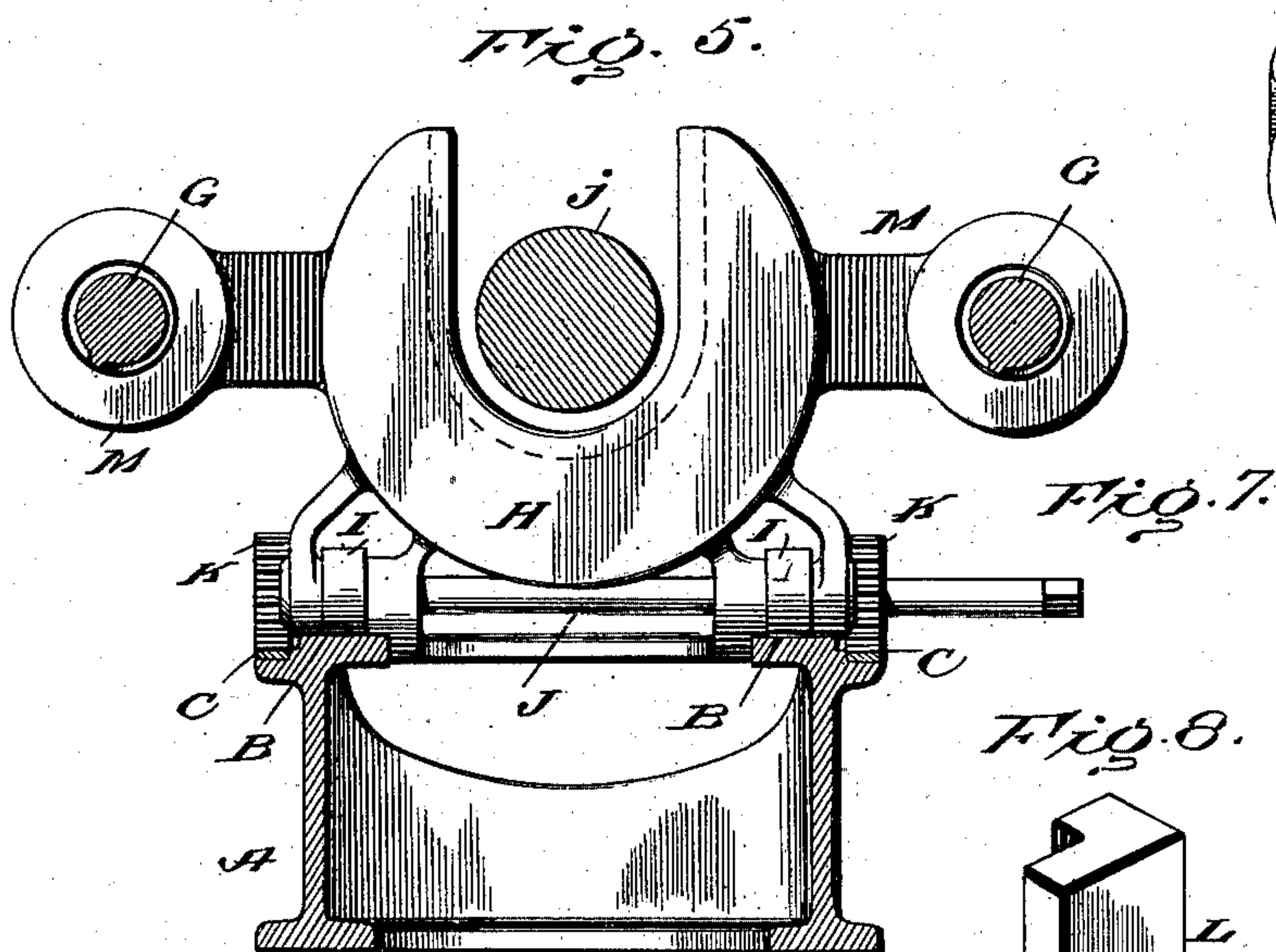
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

WALTER J. MUNCASTER, OF CUMBERLAND, MARYLAND, ASSIGNOR OF
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APPARATUS FOR APPLYING COUPLINGS TO AND REMOVING COUPLINGS FROM SHAFTING.

SPECIFICATION forming part of Letters Patent No. 750,477, dated January 26, 1904.

Application filed January 25, 1902. Serial No. 91,230. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. MUNCASTER, a citizen of the United States, residing at Cumberland, in the county of Allegany and State of Maryland, have invented certain new and useful Improvements in Apparatus for Applying Couplings to and Removing Couplings from Shafting, of which the following is a specification.

My present invention pertains to improvements in apparatus for applying couplings to and removing couplings from shafting.

The invention will be best understood upon reference to the annexed drawings, wherein—

Figure 1 is a top plan view of the machine as a whole; Fig. 2, a side elevation of the same; Fig. 3, a cross-sectional view on the line 1 1 of Fig. 1; Fig. 4, a side elevation of a portion of the apparatus on a somewhat enlarged scale, showing one of the shaft clamps or supports; Fig. 5, a cross-sectional view on the line 2 2 of Fig. 2; Figs. 6 and 7, face and side elevations, respectively, of the locking-nut, to be hereinafter referred to; and Fig. 8, a perspective view of a bushing or yoke used in conjunction with certain portions of the apparatus for removing collars from shafting.

In applying couplings or collars to shafting, especially where the shaft is of any considerable length, the shaft will, unless restrained, tend to buckle or twist, thereby destroying its utility to a greater or less extent as a line-shaft.

The object of the present invention is therefore to provide a suitable apparatus for supporting and holding a shaft of any desired length against endwise movement in opposition to the hydraulic ram or other motor which is employed for forcing the collar or coupling on the end thereof, at the same time supporting and holding the shaft against lateral deflections.

In the accompanying drawings, A indicates the bed of the apparatus, preferably composed of a series of separate sections bolted together. The upper face of the bed is provided with two longitudinal tracks or ways B, adjacent to which are formed or secured racks C. At

the forward or head end of the bed and surrounding the same there is secured a hydraulic ram or equivalent press D, the casing or shell of which is provided with laterally-extending lugs or arms E, one upon each side. At the tail end of the bed there is secured a frame F, and mounted between said frame and the arms E are rods G, which, as shown, are threaded throughout the major portion of their length. These rods are, so to speak, truss or tension rods and take all or nearly all of the strain to which the apparatus is subjected. Mounted on the bed next to the hydraulic ram or press is a frame or member H, having rollers I, resting on the ways or tracks B. A shaft J extends through the lower projecting portions of the frame, and pinions K, secured to the shaft, mesh with the racks C, whereby the frame may be moved back and forth on the bed, as desired, toward and from the hydraulic press. The upper central portion of the frame or support is provided with a U-shaped depression, into which may be placed a yoke or bushing L of the form shown in Fig. 8 for a purpose which will presently appear.

Arms M extend out from each side of the main body of the frame, and the rods G pass through openings formed therein, making a somewhat close fit therewith. Mounted on the rods G in rear of the support or frame H are nuts N, which serve to hold the frame against retrograde movement when it is brought to its desired position, the nuts of course being screwed up against the rear face of the frame. A similar frame O is mounted on the tail of the bed and forms the abutment for the end of a shaft when a collar is to be forced thereon. Said frame is provided with a removable core or center piece P for a purpose which will presently appear.

In rear of the frame upon the rods G are mounted nuts Q, preferably of the form illustrated in Figs. 6 and 7. As will be seen upon reference to said figures, the nut is a divided one, comprising two halves hinged together, and is held in position upon the rods by a bolt pivotally connected to one member and adapted to be swung over and to interlock with the

other. This construction permits of a quick adjustment of the nuts, thereby facilitating the positioning of them back of the abutment-frame after said frame is brought to the desired point on the bed.

Mounted on the bed intermediate the frames is a series of shaft supporting and clamping members designed to hold the shaft against lateral deflections when the collar is being forced on the same. These members are all alike, and a description of one will therefore suffice.

Surmounting the bed and bearing directly upon the upper and inner faces of the ways thereof is a frame or casting *a*, formed with a semicircular recess in its upper face and with openings in the outwardly-extending arms *b* thereof, through which the tension-rods *G* pass. The rods make a close fit with the openings; but there is no threaded connection between the parts. A bolt *c* extends downwardly through the frame or casting and is connected to a cross plate or bar *d*, the ends whereof bear against the under face of the ways and serve when the nut is tightened to clamp the structure as a whole firmly to the bed.

Suitable pinions *e*, splined or keyed to a shaft *f*, mesh with the racks on the bed, and by rotating the shaft the frame may be traversed along the bed to any desired point.

Pivotaly connected to the upper portion of the frame to one side of the semicircular recess or depression is a yoke or strap *f'*, the free end thereof extending to the frame on the opposite side of the depression, at which point the parts are detachably connected together by a pin or the like. Mounted in the yoke is a threaded shaft *g*, carrying at its upper end a hand-wheel *h* and at its lower end a head *i*, adapted to bear upon the shaft *j* when the same is in place.

The semicircular recess formed in the upper face of the member *a* is truly cylindrical, and inasmuch as each of the frames or "steady-rests," as they may be termed, is alike in form and dimensions these semicircular depressions or recesses are in exact alinement throughout the entire series.

Two rests *k*, adjustably mounted on the frame at approximately one hundred and twenty degrees to each other and to shaft *g*, project upwardly from the frame and serve to support the shaft. The rests *k* in the form illustrated are simply sliding plates or bars which at their lower ends bear against the ends of threaded shafts *l*, suitably mounted in the frame *a*. By using a stepped gage the rests *k* may be readily projected inwardly beyond the curved upper face of the frame *a* to the desired extent throughout the entire series, or, if preferred, the rests *k* may have an index or scale formed on one face thereof, by which the extent of projection or elevation of the rests may be readily determined. From this it will be seen that the rests *k* through-

out the entire series of the frames mounted on the bed may be quickly brought to the same elevation or extent of projection beyond the curved face, so that a shaft of any given diameter when placed thereon will be evenly supported throughout its length, with the axial center thereof in proper alinement with the head of the ram.

This apparatus is designed to be used with shafts of varying diameters, and it is therefore essential that some ready means be employed whereby the rests for the shafts may be quickly and accurately brought to position. The means above described accomplishes this end.

After the rests *k* are adjusted in the manner set forth a shaft, as *j*, is lowered into place and rests squarely upon the members *k* throughout its length. The yokes *f'* are then swung over the shaft and locked in position, after which the hand-wheels *h* are operated to cause the heads or bearing members *i* to impinge against the upper side of the shaft. The abutment-frame *O* will then be brought to position against the end of the shaft, the block *P*, carried by said frame, bearing directly against the end of the shaft. The nuts *Q* are then brought directly up against the rear of the frame *O* and prevent any retrograde movement of the frame. A collar or coupling is then put in position in front of the shaft and forced thereon through the action of the hydraulic press.

As aboved noted, any lateral deflection of the shaft will be prevented by the clamping or supporting members, which, as before explained, are securely held to the bed and are likewise prevented from bending by the tension-rods *G*, which pass through the arms *b* thereof. It will readily be seen that inasmuch as the tension-rods *G* are connected to the abutment-frame *O* at one end and to the press or ram at the other end and that as each of the rests or shaft-supports is likewise in operative relation with the tension-rods any lateral deflection or bending which might take place in the shaft owing to the pressure exerted by the ram will be prevented. Should any one of the rests or clamping members tend to bend, it will be prevented from so doing by the tension-rods. Thus it will be seen that any lateral deflection of the shaft is prevented.

Should it be desired to remove a coupling from a shaft, the shaft is lowered upon the rests *k*, but not clamped in position. Before the shaft is lowered to place a bushing *L* of suitable dimensions will have been placed in the frame *H*. The size of the bushing should be such that the rear face of the collar or coupling will have a fair bearing against the same, though it is not essential that the shaft should in any manner rest upon said bushing. With the parts in such position the head or plunger of the press is forced against the end

of the shaft, so that the shaft is moved endwise out of the coupling, while the coupling is held against movement by the bushing L. It will be understood that a head for the ram of suitable size will be employed at this time. When thus operating, the clamps would of course be loose and the shaft resting upon the rests k.

When it is desired to remove a coupling from a shaft longer than the bed of the press, the block P will be removed from the abutment-frame O, so that the shaft may be extended through said abutment-frame. Ordinarily, however, the block P will always remain in position.

The construction of the apparatus is of course susceptible of modifications in detail, and I do not, therefore, desire to limit myself to the precise construction shown and described. For example, it will be readily seen that while the form of support and clamp shown and described is highly efficient it may be modified in detail and yet accomplish the same result. It is necessary, however, to the quick manipulation and operation of the apparatus in connection with shafts of varying diameters and lengths that means be provided whereby the rests may be readily brought to the necessary elevation and in proper alinement and also that the parts may be traversed rapidly along the bed.

Having thus described my invention, what I claim is—

1. In an apparatus of the character described, the combination of a suitable bed; a press mounted at one end thereon; a frame at the opposite end of the bed; truss-rods connecting said frame and the body of the press; an abutment mounted upon the bed intermediate the press and the frame; a series of shaft-supports mounted on the bed; connections intermediate said supports and the truss-rods; and means for centering and clamping shafts of varying diameters on said supports, substantially as described.

2. In an apparatus of the character described, the combination of a suitable bed; an abutment for the end of a shaft, mounted on the bed and movable lengthwise thereon; means for securing the abutment in place; a press secured to the bed at the opposite end thereof; and means mounted on the bed intermediate the press and the abutment for clamping and centering shafts of varying diameters and holding the same against lateral deflection.

3. In an apparatus of the character described, the combination of a suitable bed; a press secured to the bed at one end thereof; truss-rods extending from the press in line with the bed; an abutment adjustably mounted on the bed; connections intermediate said abutment and the rods; a series of adjustable clamping-supports for the shaft mounted on the bed intermediate the press and the abutment; and con-

nections intermediate said supports and the truss-rods.

4. In an apparatus of the character described, the combination of a suitable bed; a press secured to the bed at one end thereof; a frame secured to the opposite end of the bed; truss-rods mounted intermediate said frame and the press; a movable abutment mounted on the bed; adjustable connections intermediate the abutment and the rods; and a series of adjustable shaft supporting and clamping devices mounted on the bed, said devices embracing the truss-rods, substantially as described.

5. In an apparatus of the character described, the combination of a suitable bed; a press mounted on one end thereof; an abutment mounted on the bed; truss-rods extending longitudinally of the bed; a series of shaft supporting and clamping devices mounted on the bed, said devices embracing the truss-rods; and means for securing the supporting and clamping devices to the bed.

6. In an apparatus of the character described, the combination of a suitable bed; a press mounted on one end thereof; a series of shaft-supports also mounted on the bed for centering and clamping the shaft being operated upon; a member mounted on the bed adjacent to the press, said member having a recess formed therein; and a bushing seated in said recess, substantially as and for the purpose described.

7. In an apparatus of the character described, the combination of a suitable bed; a press mounted on one end thereof; a series of shaft-supports mounted on the bed for centering and clamping the shaft being operated upon; a member mounted on the bed adjacent to the press; truss-rods extending outwardly from the press and in operative connection with said member; and a removable U-shaped bushing mounted in the member, substantially as and for the purpose described.

8. In an apparatus of the character described, the combination of a suitable bed; a press mounted on one end thereof; a fixed frame secured to the opposite end of the bed; threaded truss-rods extending from the press to said frame; an adjustable abutment mounted on the bed and embracing the truss-rods; means acting in conjunction with said threaded rods for securing said abutment in its adjusted position; a series of shaft supporting and clamping devices mounted on the bed and embracing the rods; and means for securing said devices to the bed in their adjusted positions.

9. In an apparatus of the character described, the combination of a suitable bed; a press mounted on one end thereof; a fixed frame secured to the opposite end of the bed; a pair of threaded truss-rods extending from the press to the frame; an abutment adjustably mounted on the bed and embracing the rods; nuts mounted on the rods in rear of said abut-

ment; a series of shaft supporting and clamping devices adjustably mounted on the bed and embracing the rods; and means for securing said devices to the bed, substantially
5 as described.

10 10. In an apparatus of the character described, the combination of a suitable bed, a press mounted thereon; a frame fixed to the opposite end of the bed; threaded truss-rods
15 mounted intermediate the press and said frame; an adjustable abutment mounted on the bed and embracing the rods; means for moving said abutment longitudinally of the bed; nuts mounted on the rods in rear of said
15 frame; a series of frames α mounted on the bed and likewise embracing the rods; adjust-

able shaft-supports mounted upon and carried by said frames; a yoke secured to the upper portion of each frame; clamps carried by said yokes arranged to bear upon the upper face 20 of the shaft; means for securing said frames to the bed; and means for traversing said frames along the bed to secure their initial adjustment.

In testimony whereof I have signed my name 25 to this specification in the presence of two subscribing witnesses.

WALTER J. MUNCASTER.

Witnesses:

HORACE A. DODGE,
J. B. MALNATI.