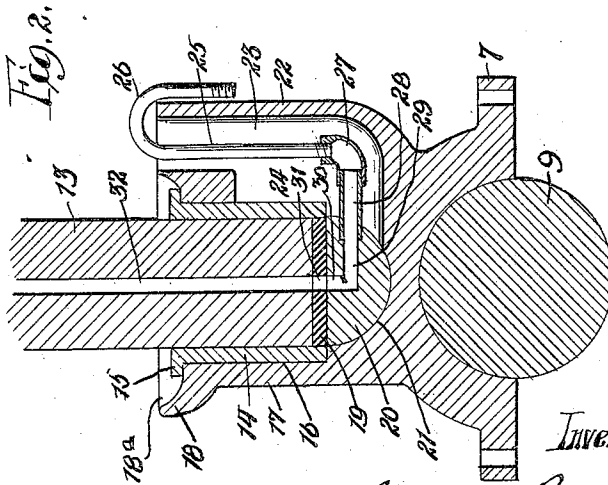


MECHANISM FOR OPERATING WIRE BLOCKS.

944,345.

2 SHEETS--SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

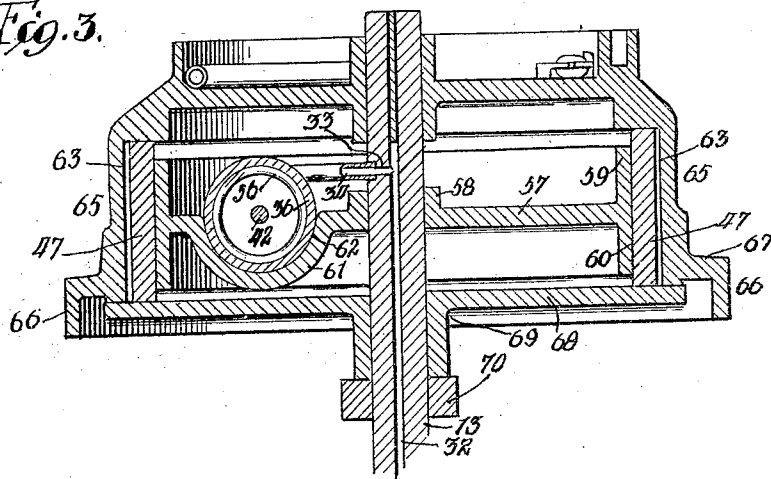
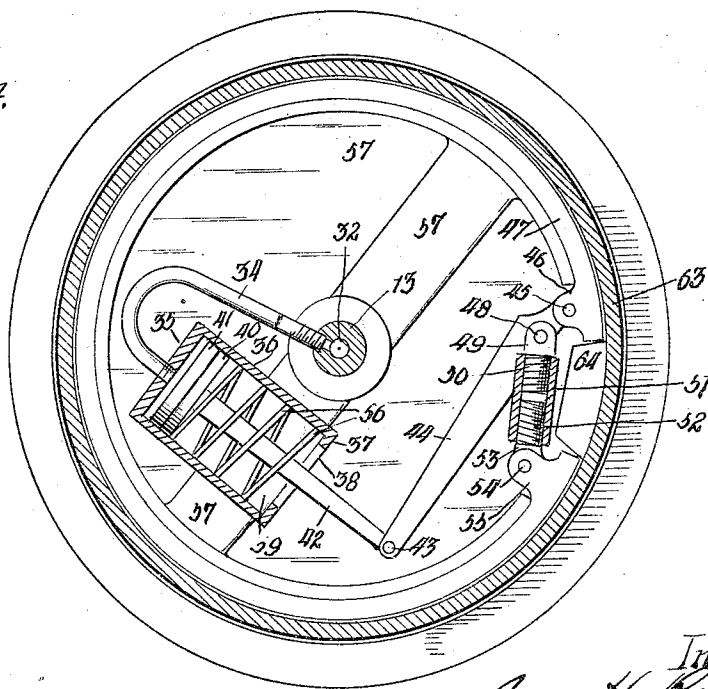


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING WIRE-BLOCKS.

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To all whom it may concern:

Be it known that I, JUAN H. REECE, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Mechanism for Operating Wire-Blocks, of which the following is a specification.

It is a desirable and necessary feature, in the operation of wire blocks, that the block should be started under a slow revolution gradually increasing in speed so as to cause a draw on the wire by which the liability of breaking the wire is decreased, and to a great extent overcome, thereby obviating the objection heretofore found in the revolving of wire blocks in which the speed is not graduated, but is the same at the start, and by which the rapid speed tends to place a strain or jerk on the wire, causing the wire to break and a consequent repointing of the wire rod in again starting the drawing operation.

The objects of the present invention are to initially start the revolution of the block under a reduced speed and gradually increasing the speed to the limit, and employing, for the purpose, a medium under pressure for operating the friction drive or clutch by means of which the wire block is driven or revolved; to utilize, in the driving of a wire block, a medium under pressure supplied through the driving shaft of the block in such manner as to operate a driving or friction clutch, engaging the wire block and carried by or from the driving shaft; to furnish a step bearing for the lower end of a driving shaft, having therein a passage for a medium under pressure, and by which the medium under pressure is discharged through the driving shaft to operate a driver for the wire block; to construct a step box, for a driving shaft having an axial passage for a medium under pressure, said box consisting of a casing or shell having a side passage for receiving a tube or pipe for a medium under pressure, a semi-spherical chamber, a semi-spherical bearing block in the chamber, and a packing between the bearing block and the end of the driving shaft; and to improve generally the construction and operation of the mechanism by means of

which a medium under pressure is utilized for driving a wire block.

In the drawings, Figure 1 is an elevation of a wire block, the driving shaft therefor, the gearing and the main driving shaft, showing also an end elevation of a supporting frame; Fig. 2 a detail in sectional elevation, showing the step box for the lower end of the driving shaft of the wire block; Fig. 3 a sectional elevation of the wire block and its driving shaft, showing a construction of friction drive or clutch for driving the block; and Fig. 4 a sectional plan view of the construction and arrangement of elements shown in Fig. 3.

The wire block and its driving shaft, driving gear and main driving shaft, are supported in any suitable frame, which can be a frame of the construction shown, having an upper, front and rear longitudinal beam 1, vertical standards 2, and front and rear longitudinal beams 3, constituting a frame-work. A cross support 4 of metal is attached at each end by suitable bolts to the lower beams 3, and this cross support 4 carries one-half 5 of a journal box or bearing. A companion half 6 of a journal box or bearing is located above the half journal box or bearing 5, and the two half journal boxes or bearings 5 and 6 each have ears 7, by means of which, and suitable bolts 8, the two half boxes or bearings are secured together so as to furnish a full journal box or bearing for the main driving shaft 9, which extends longitudinally of the bench or frame, as usual in the construction of wire drawing blocks.

The main driving shaft 9 has fixedly mounted thereon a bevel gear 10 in the construction shown, which gear meshes with a bevel gear 11 having a hub 12, by means of which the gear 11 is connected with the driving shaft 13 for the wire block.

The lower end of the driving shaft 13 is encircled by a sleeve 14, of antifriction metal, in the construction shown; and the sleeve 14, at its upper end, has a flange or rim 15, and is located in a chamber 16 of a casing or shell 17, formed integral with the wall of the half box or bearing 6 in the arrangement shown. The shell or casing 17, at its upper end, has an outwardly flaring

- rim or flange 18, forming a concave depression 18^a around the driving shaft 13 and the rim or flange 15 which rests upon the upper end of the wall of the shell or casing 17, as shown in Fig. 2; and the depression 18^a forms a receptacle for containing oil, or other lubricant, for lubricating the bearing at the lower end of the driving shaft 13, so as to reduce the friction.
- 10 The lower end of the driving shaft 13 abuts against the upper face of a packing 19; and the packing 19 rests on the upper face of a semi-spherical bearing block 20, entered into a semi-spherical chamber 21 within the casing or shell of the step bearing, as shown in Fig. 2. The shell or casing 17 of the step bearing, on one side, has a wall 22 laterally extending, and this wall 22 has a passage 23 which extends to the chamber 21 of the bearing block 20; and, as shown, the wall proper of the shell or casing 17 has an opening 24 between the passage 23 and the chamber 16 of the shell or casing 17, which passage is for the purpose of entering a supply pipe for a medium under pressure into position, in the construction shown. A supply pipe 25, having a gooseneck 26, is entered into the passage 23, and this pipe or tube 25 is connected by an elbow coupling 27 with a short tube or pipe 28, threaded into the bearing block 20 so as to be in communication with the horizontal section 29 of a passage in the block, having a vertical member 30 which is in communication with a port or hole 31 in the packing 19, which port or hole is in line with a passage 32 extending longitudinally of the driving shaft 13, as shown in Figs. 2 and 3. The gooseneck 26, of the supply pipe 25, is connected with a main supply pipe, not shown, for a medium under pressure, such as air, steam, or other suitable medium, so that the medium under pressure can flow through the pipe 25, elbow coupling 27, pipe or tube 28, passage 29, 30, and port 31, into the passage 32, for discharge, at the upper end of the passage 32, and operate a suitable friction drive or clutch for revolving the wire block.
- 50 The construction shown, in assembling the elements for supplying a medium under pressure, has the tube 28 and elbow coupling 27 entered into the bearing block 20, and the bearing block 20, with the tube and elbow coupling, is entered into position for the bearing block to rest in the chamber 21, for which purpose the opening or slot 24 is provided in the wall of the shell or casing 17, and after the bearing block, with the tube 28 and elbow 27, is entered into position, the supply pipe 25 and its gooseneck 26, can be connected with the elbow coupling. The packing ring 19 and the sleeve 14 are entered into position and the lower end of the shaft 13 entered into the sleeve so as to rest upon the packing 19 at its lower end; and when the parts are assembled the oil, or other lubricant, in connection with the packing 19, seals the step box against the escape of the medium under pressure, in operating the friction drive or clutch for revolving the wire block.
- The driving shaft 13, for the wire block, has a lateral port or passage 33 communicating with the longitudinal passage 32, for escaping the medium under pressure; and, as shown, the lateral port or passage 33 communicates with a tube or pipe 34 threaded into the side of the driving shaft 13, as shown in Fig. 3. The tube or pipe 34 is entered into a head 35 of a cylinder 36, the opposite end of which has a rim or flange 37, inwardly extending and surrounding an opening 38 leading from a chamber 39, into which the tube or pipe 34 discharges the medium under pressure. The chamber 39 has located and operative therein a piston formed, as shown, of a disk 40 and a cup leather packing 41; and from the disk 40 a piston stem 42 extends through the opening or hole 38 of the cylinder. The piston stem 42 is connected by a pin or pivot 43, with the end of an arm or lever 44, the other end of which is connected by a pin or pivot 45 with ears 46 on a band 47, made of a suitable yieldable material, such, for instance, as spring steel. The arm or lever 44, carries a pin or pivot 48, which passes through ears 49 of a threaded plug or stem 50, entered into a tube 51; and a threaded plug or stem 52 is also threaded into the tube 51 so as to form, with the tube and the plug or stem 50, an adjustable connection for the arm or lever with the other end of the yieldable rim or band 47 of the driving or friction clutch. The stem or plug 52 has an eye or ear 53, connected by a pin or pivot 54, with ears 55 projecting inwardly and from the end of the rim or band 47, as shown in Fig. 4, so that the two ends of the yieldable rim or band 47 are connected together by the arm or lever 44 and the adjustable coupling, for the operation of the piston to move the arm or lever 44 and expand and retract the band. The arm or lever 44 is moved to expand the rim or band 47, by the advance of the piston in the cylinder 36 with the admission of pressure from the tube 34 into the chamber 39 of the cylinder or casing 36; and the rim or band 47 will be held expanded, or forced outwardly, so long as pressure is maintained back of the piston. The withdrawal, or venting, of the medium under pressure, from the casing or cylinder 36 back of the piston in said cylinder or casing, releases the force exerted on the rim or band 47, and for retracting or returning the rim or band 47 to normal position, in the construction shown, a coil spring 56 is located in the chamber 39, one end abutting against the

disk 40 of the piston and the other end against the rim or flange 37, at the end of the cylinder or casing as shown in Fig. 4.

A spider or plate 57 is attached to the driving shaft 13 by a hub 58, so as to revolve with the shaft; and this spider or plate 57, around its periphery, has an upwardly extending flange 59 and a downwardly extending flange 60, furnishing a bearing face against the inner face of the expansible rim or band 47, and holding the band in position to be outwardly forced or pressed. The plate or spider 57, in the construction shown, has a depressed section 61, forming a semi-cylindrical recess, which receives and supports the cylinder or casing 36, for the cylinder or casing and the parts connected therewith to revolve with the driving shaft in the operation of the mechanism.

A friction pad or band 63 encircles the expansible band or rim 47, and, as shown, this friction band or pad 63 has attached thereto, or suitably connected therewith, a block or head 64, which projects into the space between the ends of the expansible band or rim, as shown in Fig. 4, and furnishes a backing or shoulder by which the expansible band or rim is held at one end so as to insure the expansion or outward forcing thereof in use. The wire block can be of any usual and well known form of construction, having a side wall 65 inclosing an annular chamber, in which is located the driving or friction clutch, formed by the expansible rim or band 47 and the friction rim or pad 63, with the parts so arranged that as the friction or driving clutch is forced outwardly for the friction rim or pad 63 to engage the inner face of the wall 65, the wire block will be slowly revolved, and the speed of the revolution will increase as the clutch or driving means becomes more firmly engaged with the face of the wall of the block.

The wire block, as shown, has, at the lower end, an annular rim 66, the upper face of which forms a rest or shoulder 67 for the wire. The construction shown has a plate or spider 68 with a hub 69, resting on a collar 70 encircling and secured to the driving shaft 13, which spider or plate furnishes a support for the expansible rim or band, the friction band or pad and the wire block, as shown in Fig. 3.

The present invention relates to the mechanism for revolving the wire block through force exerted by a medium under pressure, and for this reason the operation is confined to the elements by which the medium under pressure is utilized, but briefly is as follows: The medium under pressure, when it is desired to revolve the wire block, is admitted from the source of supply into the tube or pipe 25, and flows, through the connection

of said pipe with the passage in the bearing block and the port in the packing into the passage 32, and from the passage 32 flows through the tube 34 into the power cylinder back of the piston in said cylinder, causing the piston to be forced forward, carrying with it the piston stem, and, through the arm or lever 44, expanding the rim or band 47 and forcing the friction band or pad into engagement with the wire block; and, as the plate 57 revolves from the shaft 13, carrying with it the power cylinder and the arm or lever, the revolution of the shaft will be transferred to the wire block. The release of the pressure back of the piston allows the spring 56 to act and return the arm or lever 44 to normal position, releasing the engagement of the friction drive or clutch with the wire block and stopping the revolution of the block. It will thus be seen that, with this invention, a medium under pressure is admitted through the driving shaft and is utilized in supplying power to revolve the wire block, and the application of the power will be a gradual increasing force, starting the block slowly and giving an increase of speed after starting, thus enabling the wire block to be revolved so as not to exert a sudden draw or pull on the wire that would produce breaking.

The semi-spherical bearing block provides for compensation in any irregularity produced by the revolution of the driving shaft; but it is to be understood that other types of bearing blocks can be utilized for supplying a medium under pressure to the longitudinal passage in the driving shaft for the pressure to operate a friction clutch or driver, or other type of driver revoluble with the driving shaft for revolving the wire block, it being understood that the essential feature of the present invention is utilizing a medium under pressure supplied to the driving shaft, for operating a driver by which a wire block can be revolved from the driving shaft.

What I claim as new and desire to secure by Letters Patent is:

1. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage therein, means for supplying a medium under pressure to the passage of the driving shaft, and a driver for actuating the wire block operated by the medium under pressure, substantially as described.

2. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage therein, means for supplying a medium under pressure to the passage of the driving shaft, a pipe leading from the passage in the shaft, a cylinder into which the pipe leads, a piston in the cylinder, a piston stem, a lever

pivottally connected with the piston stem, an expansible band, and a coupling connecting the lever with the expansible band for expanding the band and driving the wire
5 block, substantially as described.

3. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage therein, means for supplying a medium under
10 pressure to the passage of the driving shaft, a pipe leading from the passage in the shaft, a cylinder into which the pipe leads, a piston in the cylinder, a piston stem, a lever pivottally connected with the piston
15 stem, an expansible band, a coupling connecting the lever with the expansible band for expanding the band and driving the wire block, and a spring within the cylinder for returning the piston and lever to normal
20 position and retracting the expansible band, substantially as described.

4. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage
25 therein, means for supplying a medium under pressure to the passage of the driving shaft, a pipe leading from the passage in the shaft, a cylinder into which the pipe leads, a piston in the cylinder, a piston stem, a lever
30 pivottally connected with the piston stem, an expansible band, and an adjustable coupling connecting the lever with the expansible band for expanding the band and driving the wire block, substantially as described.

5. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage therein, means for supplying a medium under
35 pressure to the passage of the driving shaft, a pipe leading from the passage in the shaft, a cylinder into which the pipe leads, a piston in the cylinder, a piston stem, a lever pivottally connected with the piston stem, an
40 expansible band, an adjustable coupling connecting the lever with the expansible band for expanding the band and driving the wire block, and a spring operating to return the piston and lever to normal position and
45 retract the expansible band, releasing and stopping the wire block, substantially as described.
50

6. In a wire block operating mechanism, the combination with a wire block of a driving shaft having a longitudinal passage therein, means for supplying a medium under
55 pressure to the passage of the driving shaft, a plate carried by and revoluble from the driving shaft, and mechanism supported upon the plate and operated by a medium under pressure supplied by the passage in
60 the driving shaft for actuating a driver and revolving the wire block, substantially as described.

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