

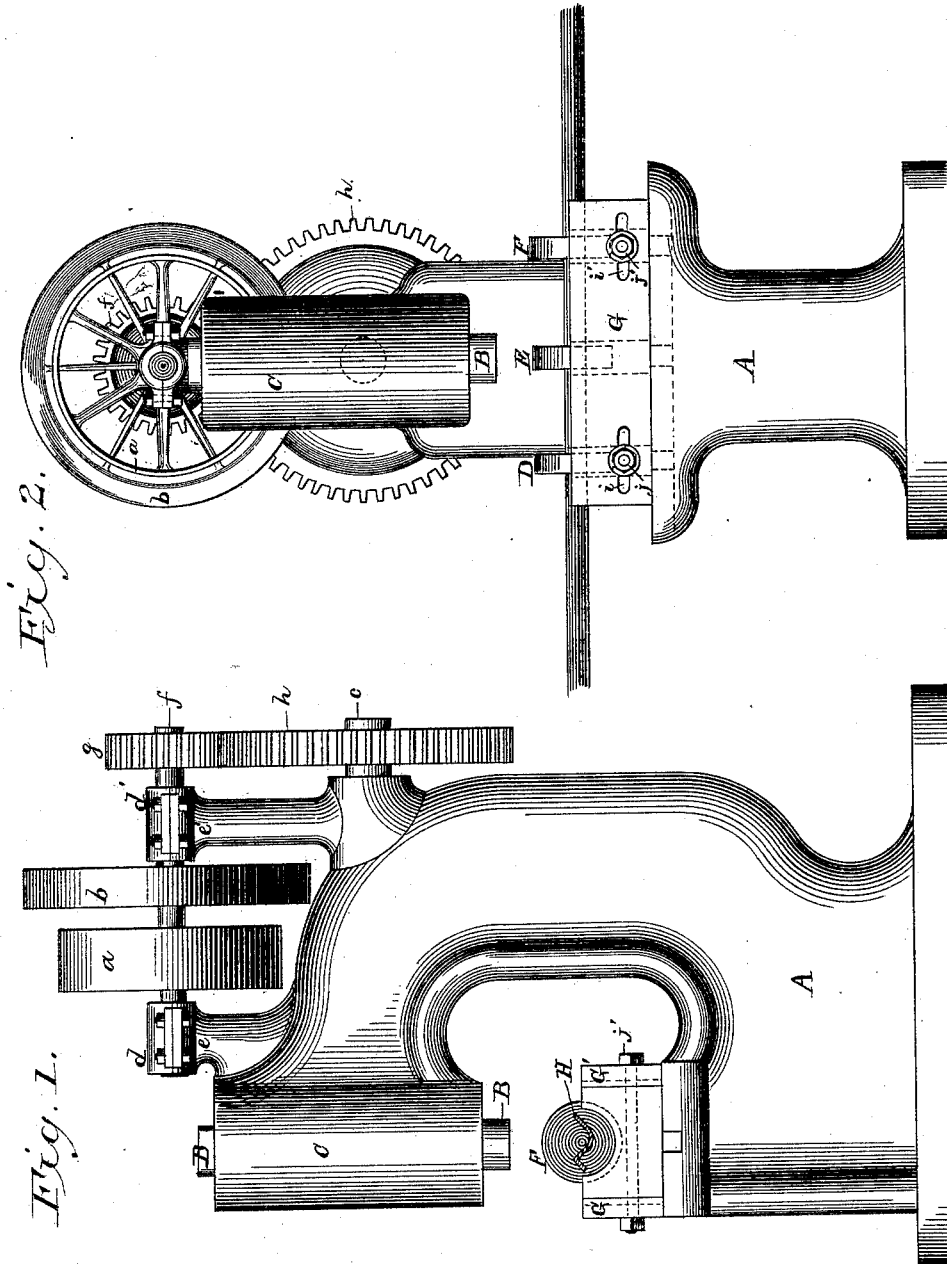
(No Model.)

3 Sheets—Sheet 1.

J. N. SHORT.
METAL STRAIGHTENING PRESS.

No. 489,102.

Patented Jan. 3, 1893.



Witnesses

H. C. Newman,
Geo. E. Shackray

Inventor

John N. Short
By *L. H. Elders* Attorneys

(No Model.)

3 Sheets—Sheet 2.

J. N. SHORT.
METAL STRAIGHTENING PRESS.

No. 489,102.

Patented Jan. 3, 1893.

Fig. 3.

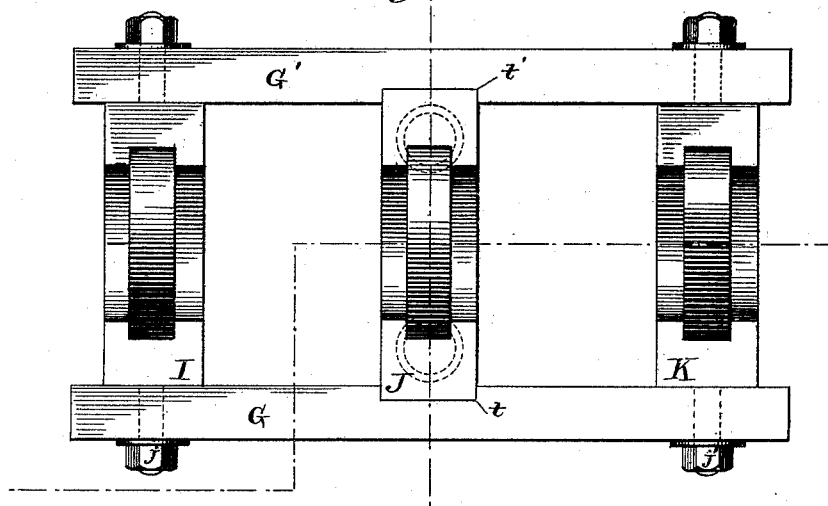


Fig. 4.

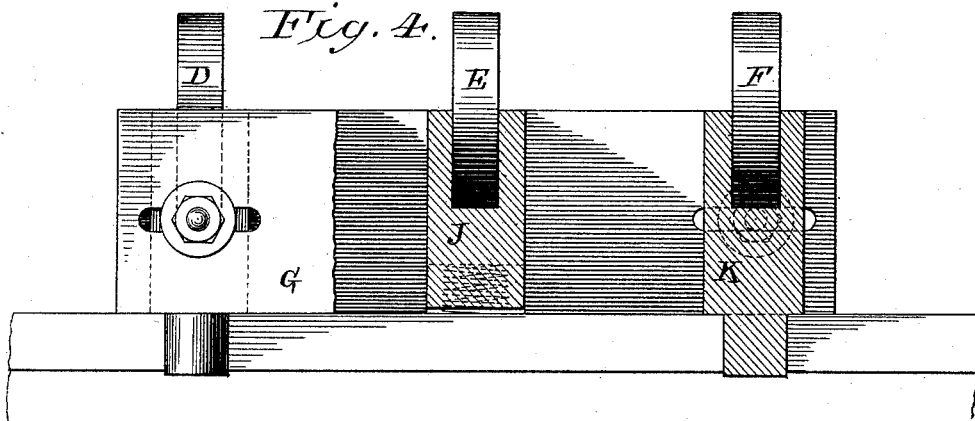
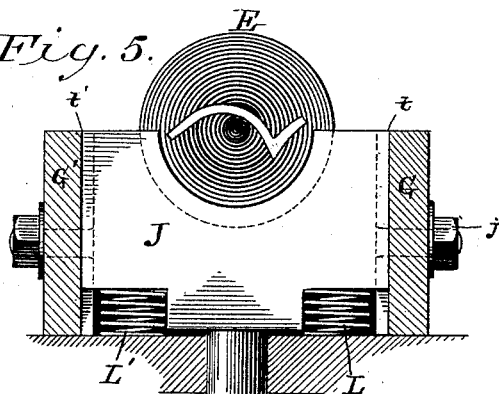


Fig. 5.



Witnesses

H. L. Newman,
Geo. E. Shackray

Inventor

John N. Short
By his Attorneys
Lyons & Elder

(No Model.)

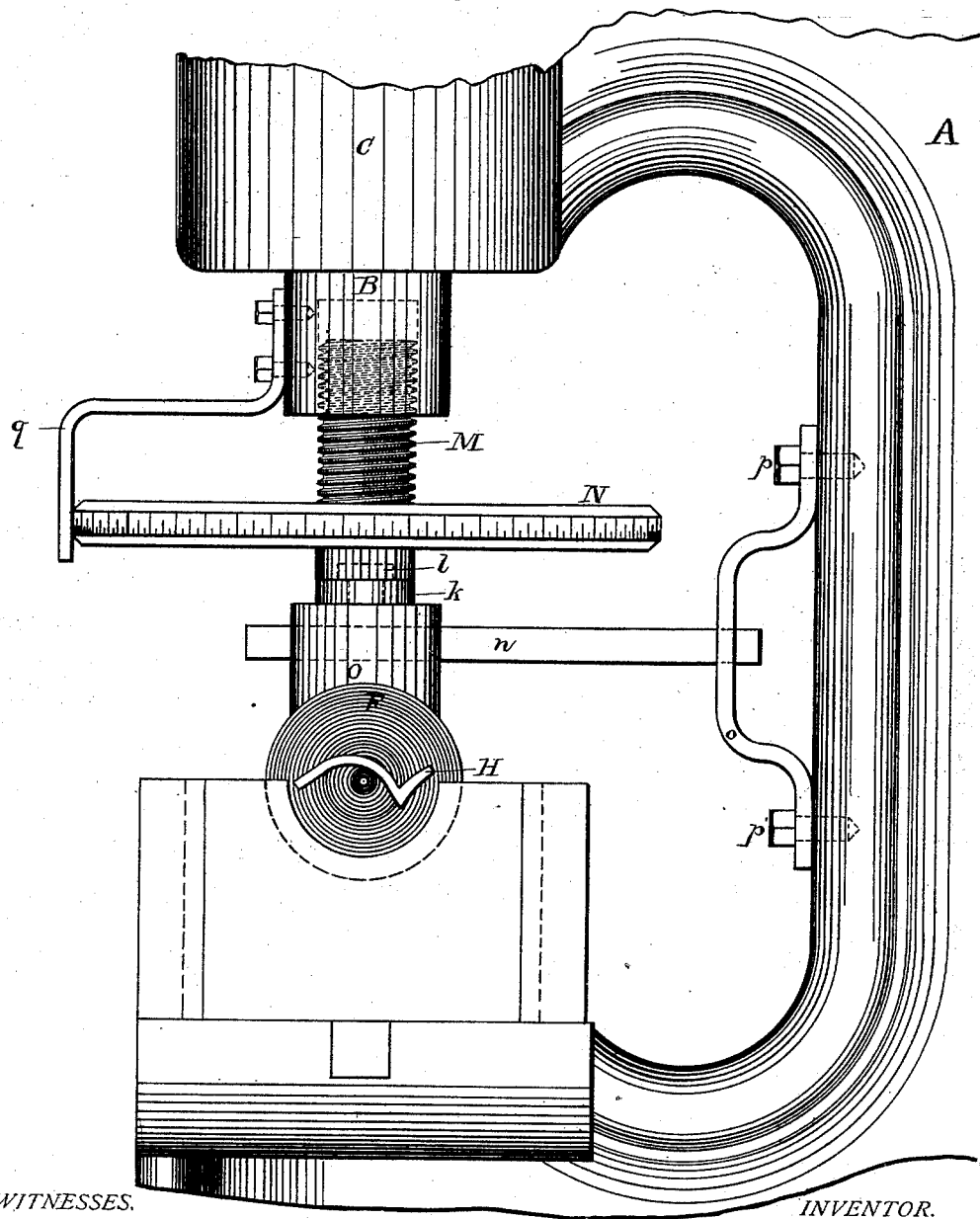
3 Sheets—Sheet 3.

J. N. SHORT.
METAL STRAIGHTENING PRESS.

No. 489,102.

Patented Jan. 3, 1893.

Fig. 6.



WITNESSES.

Ed R. Buchanan
Geo. E. Thackray

INVENTOR.

John N. Short
by Lyman Elder
his ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN N. SHORT, OF JOHNSTOWN, PENNSYLVANIA.

METAL-STRAIGHTENING PRESS.

SPECIFICATION forming part of Letters Patent No. 489,102, dated January 3, 1893.

Application filed May 7, 1890. Serial No. 350,965. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. SHORT, a citizen of the United States, residing at Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Straightening-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the process of straightening rolled bars of iron or steel it has been the practice to use a straightening press. These presses have a reciprocating plunger actuated by a crank, cam or eccentric. These plungers usually have a short and unvarying stroke. In the use of the ordinary form of press, the bar to be straightened is placed under the plunger with a suitable portion of its length between two solid supports upon which it rests. The height of these supports is so adjusted that the plunger itself at the end of its downward stroke, does not touch the bar to be straightened. In order that the crooked bar may receive pressure from the plunger, a gag is used. This gag is a piece of metal of suitable form and thickness with a convenient handle attached. The bar being placed in position, a crooked portion of it, with its convex side upward is brought under the moving plunger. At the proper time a gag is placed on top of bar in such a way that the plunger in its downward motion, presses the gag against the bar and bends that part of it which is between the supports in such a way as to make it more nearly straight.

The entire bar may be straightened by repetitions of the above described operation at the necessary points along the bar. The above described method has its objections, as in practice but one gag is used and it is manifestly impossible to combine in this one piece of metal all the sizes necessary to produce best results in straightening different bars, even though they be of the same cross-section. A gag may have the proper effect on one bar while on the next one it may produce either too much or too little "set" to have the best results; the amount of set produced being in part governed by the elasticity of the bar. This will be readily understood by those skilled in the art. In fact, the same gag may

produce a different set in different parts of the same bar, due in part to the difference in elasticity of different parts of the bar and to the amount of crookedness.

The ordinary straightening press as described above with reciprocating plunger and a gag can be used for straightening bars whose cross-section is symmetrical or regular, but it is found impossible to straighten with it, bars having a cross-section that is unsymmetrical or irregular, or bars which have thin webs or flanges, as the pressure of the gag causes a local distortion of cross-section; besides which it is almost impossible to hold the bar in a proper position to receive pressure in the directions needed at various points. This will be readily understood by those skilled in the art.

The object of my invention is to provide a press capable of straightening bars of any form of cross-section in such a way as to preserve the original form of section and to do this in a speedy, economical and convenient manner.

My device may be used in connection with any suitable form of press having a reciprocating plunger. The press may be so placed or constructed that the plunger moves in any convenient direction, vertical, horizontal or inclined, but for convenience in description, I will consider my devices to be attached to a press, the plunger of which moves vertically, and acts upon the bar at the end of its downward stroke.

A general description of my improved straightening press is as follows: A frame of any suitable form carries a reciprocating plunger the motion of which may be caused by any suitable means. Below this plunger on the frame of the press is carried a supporting frame having the form of a rectangular box with ends and top removed. In the inside of this box near its center are two vertical grooves in its sides so formed as to hold a rectangular block while allowing it to slide up and down. Contained in the box are two other rectangular blocks, one near each end. These blocks have their longer axes horizontal and at right angles to the horizontal axis of the box. These two end blocks are held in place by bolts passing through them and the sides of the box, the box having horizon-

tal slots near its ends to receive the bolts and to allow the blocks to be adjusted and held at different distances from the sliding block above referred to. These end blocks rest
5 solidly upon the bottom of the box containing them.

The center block above referred to, has its two bottom corners cut away in such a manner as to form two rectangular notches, one at each end. In the space made by these
10 notches are two spiral springs, their bottoms resting on the bottom of the box above referred to, while their tops rest against the center block and support it. The tension of
15 these springs is such as to keep the top of the block which they support in line with the tops of the two end blocks. This center block has its bottom cut away to allow it to move downward when pressed upon.

All three blocks above referred to have their top sides cut away so as to form semi-cylindrical grooves, the axes of which are perpendicular to the longer axes of the blocks and parallel to the axis of the box containing the
25 blocks. Resting in the grooves in the three blocks are three cylindrical disks, the construction of which and the bearing blocks is such that the disks may be easily revolved on their axes. These disks are made in sets of
30 three, each of which has near its center an orifice to receive and support a rolled bar. These orifices in each set of three disks have the same form of cross-section as that of the bar which they are designed to hold, and are
35 made with a small clearance so as to allow the bar to slide backward or forward through them. The holes in these disks may be varied in different sets of three disks to suit any form of cross-section of a rolled bar, as will
40 be readily understood. The box with end blocks, central sliding block, and disks is so placed and held that the center of the central disk is in line with the axis of the reciprocating plunger of a press. If a bar be placed in
45 the holes in the three disks, it will be readily seen that by the use of a gag between the end of moving plunger and top of central disk, the bar may be pressed upon and straightened as before described while the disks support it and prevent local distortion of its
50 cross-section.

My devices above described may be used with good results in connection with the ordinary plunger and gag; but in order to overcome the objections, I have stated, to the use
55 of a gag, the press may be fitted with the following device:

The bottom of the reciprocating plunger of the press is provided with an axial bore, threaded for a large screw. In this threaded
60 bore works a bar having a suitable thread at its upper end. The central portion of this bar has firmly attached to it a hand wheel, the rim of which may be graduated. Projecting below this hand wheel is a prolongation of the bar which carries at its lower end
65 a presser-head so attached that the screw may

be revolved without revolving the presser-head. The bottom of this presser-head has a curved form such as to fit the surface of the
70 central cylindrical disk upon which it acts. This presser-head has an arm attached to it, the other end of the arm resting in a slot or slotted bracket attached to some stationary
75 part of the press frame. This arm serves to prevent the presser-head from revolving as the screw is revolved by the hand-wheel, while it does not interfere with the upward or downward motion of the presser-head.

Attached to the bottom of the reciprocating
80 plunger is a pointer, the edge of which is against the graduated edge of the hand-wheel. This pointer serves as a guide to the operator in moving the presser-head up or down by means of the hand-wheel and screw.
85

It will be seen that by the use of this device the bar to be straightened may be bent more or less at the will of the operator, and without the use of a gag.

Having given this general description of my
90 invention, I will now to make my invention more clear, refer to the annexed three sheets of drawings which form a part of this specification, and in which like letters refer to like
95 parts.

Figure 1 is a side elevation showing my device for holding a bar, attached to a straightening press of ordinary form. Fig. 2 is front elevation of same. Fig. 3 is a plan showing my device for holding the bar to be
100 straightened. Fig. 4 is side elevation of the same with part of the side of the box broken away to show the bearing blocks in central section. Fig. 5 is cross-section at one side of the center of my device for holding the
105 bar, showing in elevation the central sliding bearing block and its cylindrical disk the latter in this case having a hole to receive a bar of unsymmetrical section called a J bar. Fig. 6 is an elevation showing my substitute for a
110 gag in connection with my devices for holding a bar to be straightened in a press.

In the different figures, A is the frame of the straightening press, carrying the pillow blocks *ee'* with caps *dd'*. These pillow blocks
115 carry the driving shaft *f* which has the belt pulley *a*, the fly-wheel *b* and at its end the driving pinion *g*, which pinion meshes with and drives the spur-wheel *h*, which latter in turn, imparts its motion to the eccentric shaft
120 *c*. This eccentric shaft has upon it at a point within the frame, an eccentric which imparts a reciprocating motion to the plunger B, which plunger moves in suitable guides in that part of the frame marked C.
125

G G' are the sides of a rectangular box, with the slotted holes *i i'* to receive the bolts
130 *jj'*, which bolts hold the bearing blocks I and K in place of the box G G'.

The sides of the box G G' have on their inside at their centers the vertical slots *tt* as shown in Fig. 3. The bearing-block J slides in these slots and is supported by the springs
135 L L'. These springs are so adjusted as to al-

low the block J to move downward when pressed upon, and at other times to hold it with its upper surface in line with the upper surfaces of the stationary blocks I and K.

5 Each of these bearing blocks I and J and K has a semi-cylindrical groove on top. In these grooves rest three cylindrical disks, D, E and F. These disks can revolve on their axes while supported by their bearing blocks. As
10 shown in the drawings, the disks are shown with holes for receiving and supporting the piece to be straightened, which in the illustration is what is called a J bar and marked H, the form of which is best seen in Figs. 5
15 and 6.

Referring now to Fig. 6, to constitute my adjustable device used in the place of the ordinary plunger and gag, the plunger B is bored and threaded to receive the screw M which
20 has the hand-wheel N firmly attached thereto. This hand-wheel has a graduated rim. Fastened to the plunger B is the pointer q with its edge against the graduated rim of the wheel N. This pointer in connection with the
25 graduated rim of the hand-wheel N serves to indicate to the operator the amount of upward or downward motion communicated to the presser-head O by the revolution of the wheel N. Below the hand-wheel the screw-bar M is
30 bored out to receive the end of the presser-head O. This end is cylindrical with a collar l at its top. The collar k is screwed to the bottom end of bar M, thus keeping the presser-head O in place while allowing screw M to re-
35 volve.

The bottom of presser-head O is so formed as to properly bear upon the upper surface of the central cylindrical disk E. The head O has a rectangular hole in which the lever n is
40 fastened. The other end of this lever is held from moving laterally by the slotted bracket o which is fastened to the frame A by the bolts p p'. This lever thus keeps presser-head O from revolving with the screw M, while allow-
45 ing it to move vertically. H is the bar to be operated upon, shown in elevation in Fig. 2 and in section in Fig. 1.

Having now described my invention, I will show how it is operated. A set of disks hav-
50 ing orifices of the proper cross-section to receive the bar to be operated upon, are placed in position as shown. The bar, indicated in the drawings as of the form H is slid endwise through the holes in the disks D, E and F, until
55 the part to be operated upon is at the central disk E, and is turned, the disks turning with and supporting it, to present any side or edge to the gag or presser-head that may be desired. The machine is started causing the plunger B
60 to move up and down, when by a proper movement of the hand-wheel the presser-head O may be made to move downward from the plunger in such a way that at the completion of a downward stroke of this plunger, the
65 presser-head O will come in contact with the

top of the disk E pressing it and its contained bar downward in the direction desired for straightening. The presser-head or plunger being retracted and its motion stopped, the bar may now be moved backward or forward,
70 or may be revolved in such a way as to bring any part of it under the plunger when the pressure is applied as before. By a proper repetition of this operation, the various parts of the bar may be straightened without dis-
75 tortion.

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

1. In a straightening press, the combina-
80 tion with a reciprocating plunger of a disk perforated to receive the bar to be operated upon, with springs supporting said disk, and yielding to pressure, and two supports for
85 said bar, one on each side of the said disk, substantially as set forth.

2. In a straightening press, the combina-
90 tion with a reciprocating plunger of two revoluble disks adjusted to resist pressure, placed one on each side of the line of thrust of the
95 plunger, and having orifices to receive and support the bar to be operated upon of a like section to that of the bar, substantially as set forth.

3. In a straightening press, the combina-
95 tion with a reciprocating plunger of a revoluble center disk perforated to hold and support a bar and yielding to pressure, with supporting revoluble disks, arranged on each
100 side, and adjusted to resist pressure, substantially as set forth.

4. In a straightening press, the combina-
105 tion with a reciprocating plunger of a set of disks perforated to receive the bar to be operated upon, and revoluble with the bar, sub-
stantially as set forth.

5. In a straightening press, the combina-
110 tion of a reciprocating plunger with a set of three revoluble disks perforated to hold the piece to be operated upon, the two outer disks
presenting a firm resistance to downward pressure, and the central disk being adjusted to yield to downward pressure, substantially
as set forth.

6. In a straightening press, the combina-
115 tion of a reciprocating plunger having an adjustable plunger-head with a set of revoluble disks perforated to support the bar to be operated upon, substantially as set forth.

7. In a straightening press, the combina-
120 tion of a reciprocating plunger with a set of revoluble disks perforated to support the bar to be operated upon, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN N. SHORT.

Witnesses:

CHAS. H. PRICE,
HENRY FOX.