

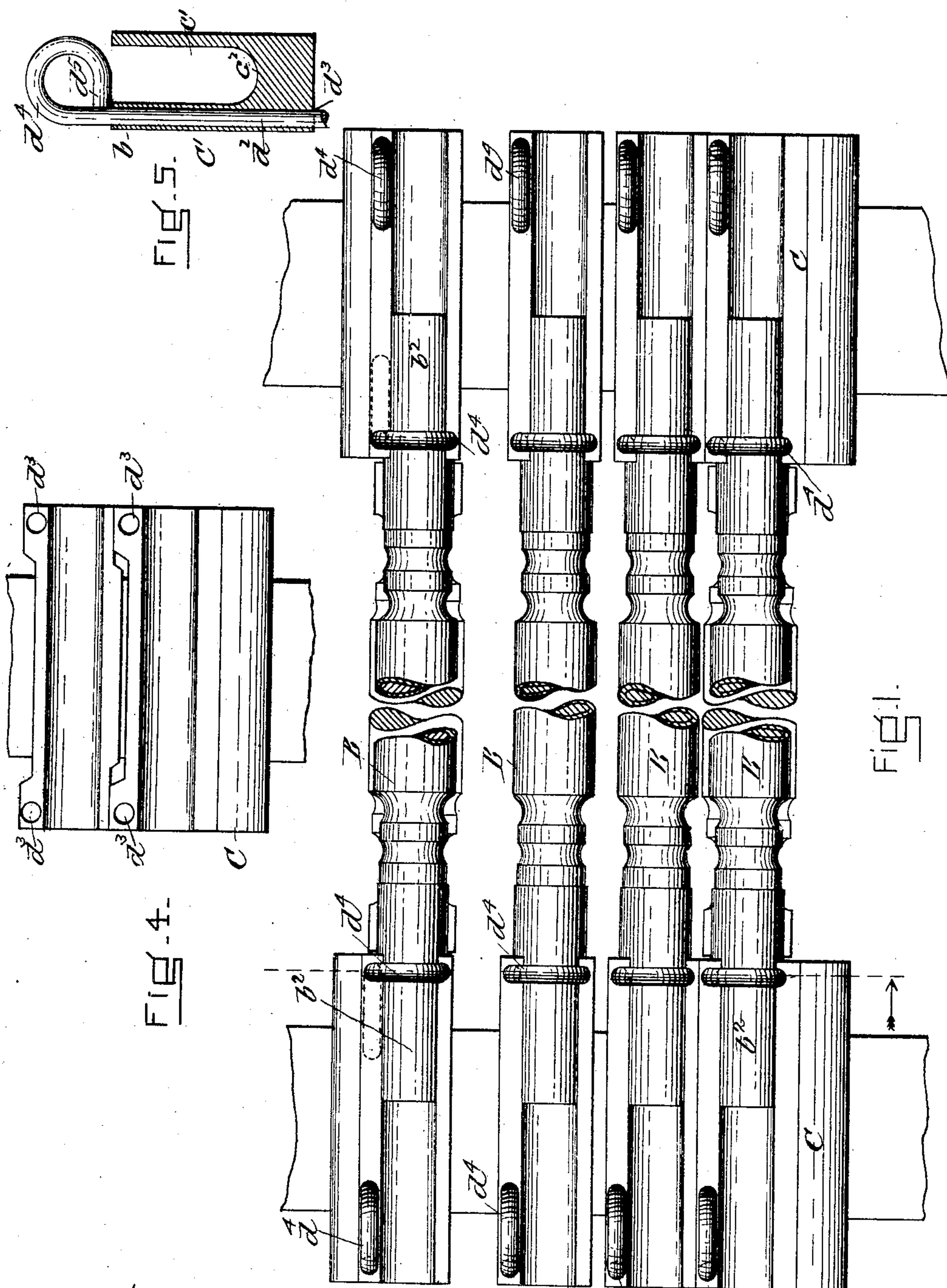
No. 779,799.

PATENTED JAN. 10, 1905.

L. W. PENNEY.  
DRAWING FRAME.

APPLICATION FILED JULY 18, 1903.

3 SHEETS—SHEET 1.



WITNESSES:

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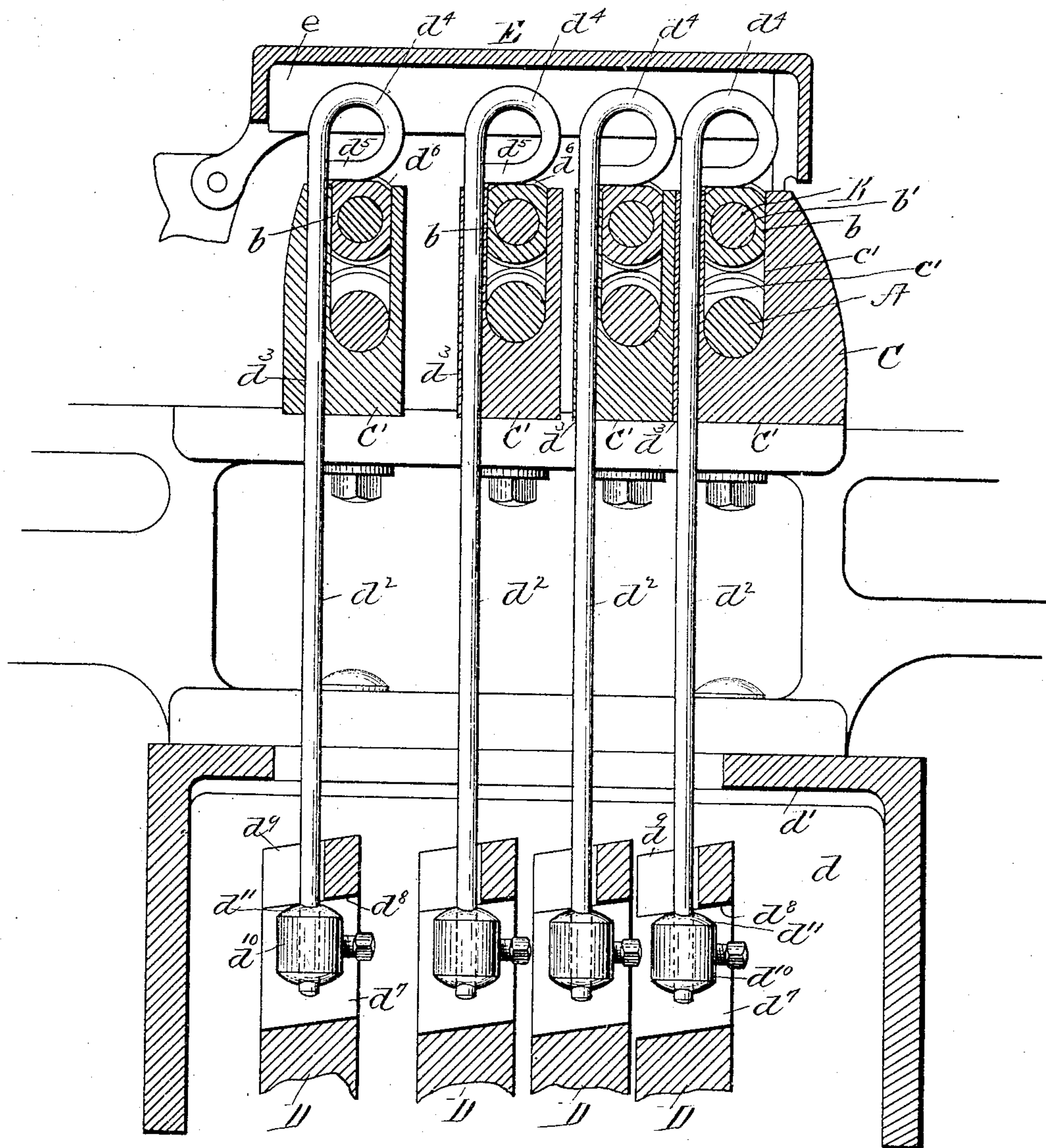


Fig. 2.

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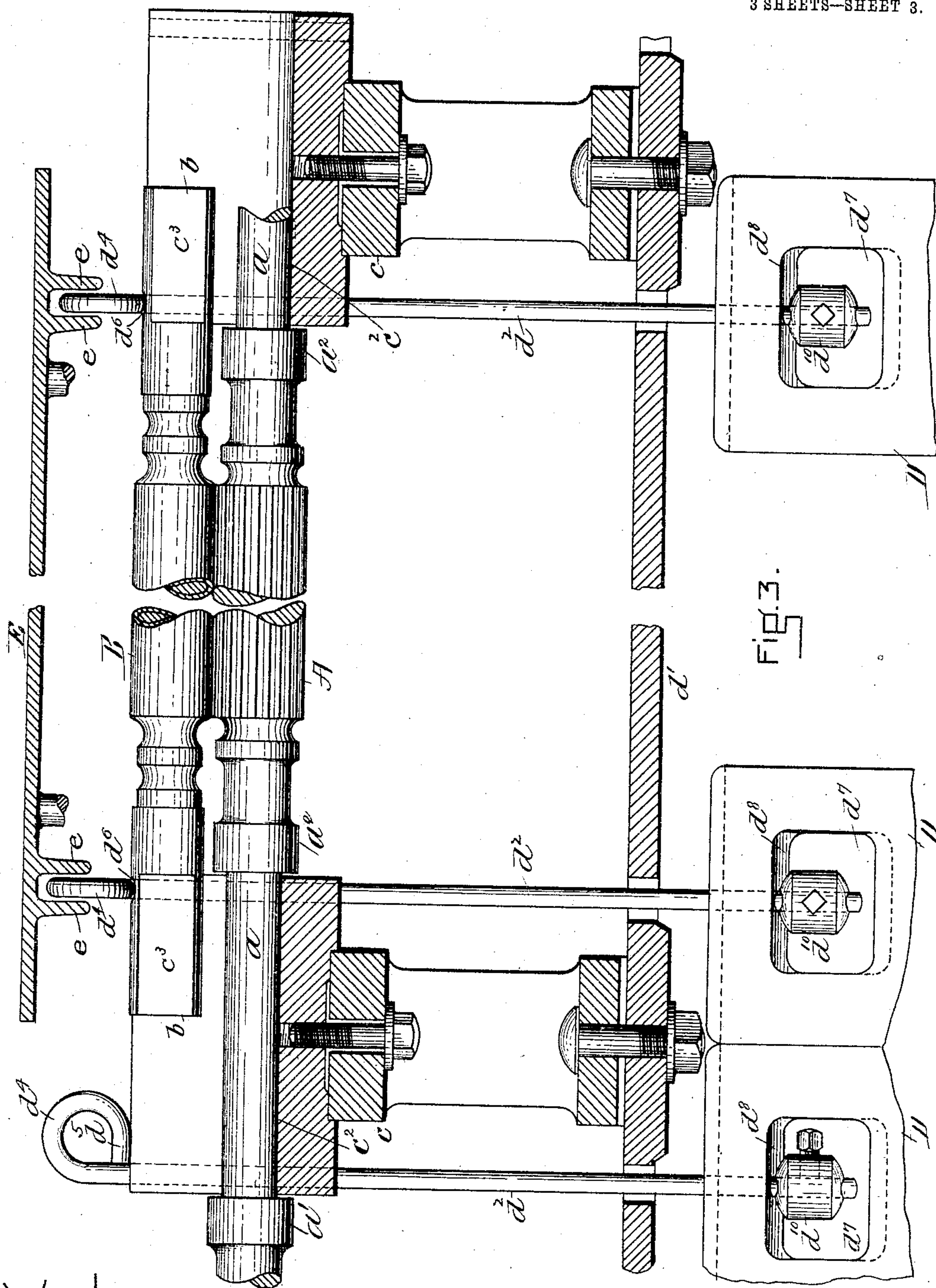
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3 SHEETS--SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## DRAWING-FRAME.

SPECIFICATION forming part of Letters Patent No. 779,799, dated January 10, 1905.

Application filed July 18, 1903. Serial No. 166,121.

*To all whom it may concern:*

Be it known that I, LOREN W. PENNEY, a citizen of the United States, and a resident of Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Drawing-Frames and Similar Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

Heretofore the rolls of drawing-frames and similar machines have been yieldingly held together by means of weights which have been so coupled or attached to the upper rolls as to require that the weights be lifted and disengaged from their couplings and that the couplings when thus released from the weights be lifted from the rolls in order to permit of the removal of the upper roll or of both the upper and lower rolls from the stands.

As it is necessary to quite frequently remove one or both rolls from the stands and as the weights and their couplings are so arranged within the machine as not to be readily reached, handled, and moved and as the weights are also heavy, it followed that the release of the rolls from their weights or their adjustment to varying lengths of staple was a somewhat arduous and slow undertaking, and it is to overcome the objection caused by this unhandy and undesirable construction and to save time in the adjustment and operation of the machine that the present invention has been made.

The invention consists in so connecting the weights with the rolls and their stands that the rolls, or any of them, may be disengaged from their weights and from the stands by a movement of each weight coupling or connection which shall not require that the weights be lifted with regard to the rolls or that they be disconnected from their couplings and which shall also so connect the roll-blocks with the weights that such of the blocks as may require to be moved horizontally upon their supports for the purpose of varying the distance between the rolls to adapt them to

work upon varying lengths of staple may be so adjusted without disconnecting their respective weights from them—that is, the various blocks and their respective weights are adjustable together without changing in any way the relation of the weights to the blocks or of the weight-couplings to either.

In the form of the invention as hereby disclosed the blocks form a part of each stand and contain bearings for the lower rolls and holders for the boxes of the upper rolls. They are made longer than has heretofore been customary and so as to extend beyond their supports, and excepting the first one in order they are horizontally adjustable with respect to each other and lengthwise the support. Each of the blocks, including the stationary one, is combined with one or more weights by means of a weight-coupling attached to the block in such a manner as to be capable of a turning movement in it, a slight vertical movement in it, and a horizontal movement with it and with the weight it supports. Each coupling may also be so combined with the box as to prevent undue rocking or chattering of the upper roll.

The vertical movement of the coupling is for the purpose of permitting the upper roll to be lifted from the lower roll by the staple or roving which passes between the rolls. The turning movement of the coupling is for the purpose of permitting its offset upper end above the block and roll-box and which acts as a foot and also as a handle and as a turning device to either actively rest upon the box of an upper roll or to passively rest upon the roll-block at one side of the upper roll-box when it is desired to remove the upper roll and its boxes from their holding-blocks and also the lower roll, if necessary. This turning movement of the coupling is a quarter-revolution in extent and enables the rest to either extend across the upper roll-box or to be moved upon the block to be lengthwise it and to be then in that position so held as not to overlap upon the outer side of the block or upon its box-holding recess. This is essential, because the space between the box-hold-



ing recesses of the boxes, which are close to each other when short staple is being worked upon, is so narrow as not to afford any other disposition of the coupling handle and foot.

5 The surface of the box upon which the coupling-rest bears and the surface of the block upon which the coupling-rest also bears should be of substantially the same level, so that the rest may be easily and readily turned from one  
10 to the other.

The combining of the weight or weights of each block with the block by means of a coupling which connects the weight or weights with the block permits the simultaneous movement in the adjustment of the blocks and rolls  
15 for variations in length of staple of the block, the weight or weights, and the coupling or couplings without changing their operative relation to each other.

20 The provision for preventing the rocking of the upper roll consists in so arranging the coupling-foot that a portion thereof when it projects over the roll-box shall upon a downward movement of the roll-box caused by a  
25 rocking movement of the roll-shaft come into contact with a stop on the block, thus relieving the upper roll and its box from the stress or effect of the weight while the end of the roll is depressed lower than is desirable because  
30 of said rocking motion, and this release of the roll from the weight tends to reduce the rocking movement and also to prevent it from being unduly worn by said rocking movement.

By causing the weight-couplings to pass  
35 through the blocks of the roll-stands the couplings are also protected by the stands from accumulating deposits of grease and other matter, so that they do not require cleansing as often as they do with the constructions now  
40 in use, the roll-stands acting in the nature of a housing for the couplings.

I will now describe the invention in conjunction with the drawings forming a part of this specification, where—

45 Figure 1 is a view in plan of enough of a drawing-frame to show the construction and operation of my invention. Fig. 2 is a view in cross vertical section thereof. Fig. 3 is a view in elevation thereof. Fig. 4 is a view in  
50 plan of a modified form of the construction of the roll-blocks of the rolls, which are placed closely together and so that they may be made sufficiently wide in parts to contain the holes required for the connections between the  
55 weights and the rolls. Fig. 5 is a detail view of a roll-block and a portion of a coupling to illustrate the use of the block as a stop in preventing the coupling from following the downward movement of the roll-box beyond a given  
60 point and when the roll is rocking.

The drawing-frame shown in the drawings may have the common complement of lower rolls A and upper rolls B, and they may be of the usual construction. They are mounted in  
65 the roll-stand C, as hereinafter stated. The

lower rolls may be continuous throughout the frame, and they are positively driven. The upper rolls are preferably in short sections of a length to span two stands only, and they rest upon the lower rolls or the roving which  
70 passes between them and are driven by the lower rolls through the roving.

A usual construction of the lower and upper rolls showing their working and bearing sections is represented in Fig. 3. 75

The stand comprises in part a number of blocks C'. They are mounted upon a support c and have, with the exception of the first in order, horizontal adjustment thereon independently of each other in order that the rolls  
80 may be horizontally adjusted with respect to each other according as the length of staple which they work upon varies. The usual manner of mounting these blocks upon their supports, of adjusting them horizontally thereon, and of locking them thereto may be used. Each block is of a length to extend beyond each side of the support, excepting, of course, the end ones of the stand, to provide a part through which the weight-couplings may extend, as hereinafter stated, (see Fig. 3,) and so that the couplings may extend through the blocks, but not through the supports for the blocks. Each block has opening from its upper surface a deep box-holding recess c',  
95 the rounded bottom of which forms a bearing c<sup>2</sup> for the lower rolls, which are reduced in size at a, where they rest in the bearing, and between the shoulders a' a<sup>2</sup> upon each side of the block. (See Fig. 3.) The upper  
100 rolls are mounted in the boxes b, (see Fig. 2,) and the boxes are squared to fit their recesses c' and to be held from lateral movement by the sides c<sup>3</sup> thereof; but they are free to have restricted vertical movement therein. The  
105 box-holding recesses c' are open at the top to permit the ready removal from the stand of the upper rolls and their boxes and also, when desired, of the lower rolls. Each box has a longitudinal bearing b' extending through it,  
110 into which an end section b<sup>2</sup> of the upper roll extends. These ends are reduced in size as compared with the size of the working sections, and the boxes are sufficiently short in height to not come into contact with the sections a of the lower rolls. With this organization in mind I will now describe the means employed for yieldingly holding the working portions of the upper rolls in contact with the working portions of the lower rolls and  
120 in a manner to have such pressure as may be required immediately applied to them or immediately removed from them, and so that the rolls may be quickly disengaged from the stands and be replaced. 125

The most convenient way of applying pressure to the rolls of which I have knowledge is the manner now in use—viz., weights. Two weights are employed for each upper roll, one near each end thereof, and this brings  
130



two weights adjacent to each stand, excepting, of course, the end stand.

D represents the weights. (See Figs. 2 and 3.) They are contained in the space  $d'$  below the bed  $d'$  and in the central and lower part of the frame, which is their usual location. Each weight is connected with a box  $b$  of an upper roll by means of a coupling-rod  $d^2$ . The rod is attached to the weight in a manner to permit it to be turned therein without turning the weight, and each rod extends upward through a long hole in the beam provided for them and through the vertical hole  $d^3$  in the overhanging end of each roll-block, which hole is arranged closely to one side of the box-recess, (see Fig. 2,) and so that the rod shall pass up through the block at one side of the box and also outside of the block-supports. The rod projects above the block and is of sufficient length to be there formed into an eye, button, or handle  $d^4$ , the lower part  $d^5$  of which forms a rest which is adapted to bear either upon the upper surface of the box  $b$  or upon the wall of the block, according as the rod may be turned. When the rod is turned to release the box, its overhanging eye or handle will still support the weight, which will then rest directly upon the top of the block instead of upon the box, and the upper roll and its box and the lower roll are then free to be detached from the stand by an upward movement.

The box may have a slight depression or seat  $d^6$  extending across it to receive and hold the seat  $d^5$  of the rod and in a way to prevent it from being jarred out of engaging position with it, the slight shoulder upon each side of the recess serving as a stop. The same result is secured by forming the cover E (see Figs. 2 and 3) with the lugs or plates  $e$ , which close upon each side of the handles or eyes  $d^4$  when the rods engage a box and hold them from turning.

A convenient way of attaching the weight to each rod is represented in Fig. 2, where the weight is represented as having a hole  $d^7$  extending across it near its upper end, the upper surface  $d^8$  of which is slightly inclined and from which extends upward the recess  $d^9$ , open at one side. The hole  $d^7$  is of a size to receive the adjustable collar  $d^{10}$  on the lower end of the rod. The collar is detachably secured to the rod by a set-screw and has the rounded surface  $d^{11}$ , upon which the inclined surface  $d^8$  of the weight bears, and the rod extends through the recess  $d^9$ . This permits the rods to be readily placed in their box-holes or to be removed from them, the weight and the rod to be easily combined without detaching the collar, and it also hangs the weight upon the rod, so that jar will not serve to disengage or work the weight from the collar, such jar as there may be serving to maintain the weight centrally seated on the collar. The construction is also such as to permit the

turning of the rod and collar within the weight without turning the weight.

It will be understood that each upper roll is held to the lower roll by two independent weights, that each of these weights engage an end of the upper roll through its box by a rod, that each rod serves to connect a weight with or hang it upon the roll, that it also serves to communicate the slight vertical movement of the roll to the weight, and that it further serves as a means for disengaging the weight from the roll without disengaging it from the block. Consequently it has capacity for vertical movement in the block and capacity for turning upon it, so that the portion which engages the upper roll or its box may be moved from it to a position at one side of it. It will further be noticed that the rod serves also to hold the weight to the block when it is not engaged with the upper roll or its box. While these various functions are illustrated as contained in a single integral connection between the weight and the the roll-box, as this seems to be the best form in which the invention can be embodied; I do not, of course, confine myself to a structure employing a single integral rod, but may use any modification of the structure which shall insure a connection between the weight, block, and the roll-box which shall be capable of engaging the weight while coupled to the block with the roll-box or disengaging it therefrom and without disengaging the weight therefrom.

The coupling of the weights to the upper roll through the stand-blocks secures the weights to the stand-blocks and permits the stand-blocks to be used as a means for adjusting the horizontal position of the weights and of the weight-couplings when horizontal adjustment of the rolls with relation to each other is necessary, and either in the original putting together of the machine or later for exigencies of operation.

I prefer that the rest  $d^5$  of the coupling-rod be of sufficient length in its active position on the roll-box to extend from the box over the portion of the block between the straight part of the rod and the box, (see Fig. 5,) and this part of the rest, in connection with the block, serves to hold the weight from following downward the roll-box in case of the tipping of the roll in rocking to a position below the upper surface of the portion of the block referred to, and thus prevents an increase or continuation of the rocking movement of the upper roll and injury to it while rocking as well.

It is hardly necessary to describe specifically the operation of the invention, as the way in which the rods are operated by turning to make engagement between the weights and the roll-boxes and disengagement therefrom so that the rolls and roll-boxes may be removed has been sufficiently given. I would



add, however, that the arrangement which I have shown is very desirable, not only for the reasons already given, but because it is a cheap and simple construction and one that is also very compact and disposes of the means for engaging and disengaging the weights so that they are not in the way at any time, do not conflict with each other, and are equally unobjectionable in their position whether acting to hold the weights engaged to the roll-boxes or whether acting to simply suspend the weights from the stand when it is desirable to remove the rolls from the stand.

Some of the rolls require to be placed closely together—notably the first and second sets of the series—and where this is the case the bearing-blocks must be made narrow—so narrow, in fact, that unless provision is otherwise made the holes  $d^3$ , required for the connecting-rods, will pass through the edges of two blocks. This, of course, is not a desirable construction, and I therefore for such blocks so make them that the parts through which the holes  $d^3$  pass shall be of sufficient thickness to permit the entire holes to be formed in them, and this is accomplished by forming these blocks as represented in Fig. 4, where recesses are formed near each end of one block, which permit corresponding enlargements to be made near the end of the next adjacent block and in which enlargements the holes  $d^3$  are formed.

I prefer that the blocks be made relatively long and to have a considerable overhang from their supports, also that the boxes for the upper rolls extend laterally from the ends of the blocks an appreciable distance and that the coupling-rods be arranged to extend through the blocks as near their ends as possible and when in engagement with the boxes of the upper rolls to bear upon them near the center of their length. This construction provides longer bearings for the rolls than has been customary and applies the weights to the upper rolls at the best place to reduce their rocking action.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, separate means for yieldingly pressing the upper rolls upon the lower rolls, and a connection between each of said means and the upper rolls, movable in one direction without disengagement from said yielding means to release said upper rolls, each block having a surface adapted to receive a portion of said connection when said connection has been moved to release said upper rolls.

2. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, separate means for yieldingly pressing the upper rolls upon the lower rolls, and a connection between each of said means

and the upper rolls movable in a substantially horizontal plane to engage or release said upper rolls, and means adapted to engage and support said connection when it has been moved to release said upper rolls.

3. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, separate means for yieldingly pressing the upper rolls upon the lower rolls, and a connection between each of said means and the upper rolls arranged to be turned upon its longitudinal axis and having at its upper end a lateral extension, adapted in one position to engage the upper roll, or its box, and in another position to engage the bearing-block, and whereby the engagement or release of the roll is obtained by a turning movement of the connection, and whereby also the engagement and disengagement of the yielding means with the upper roll is effected without uncoupling said yielding means from its connection and without lifting said yielding means.

4. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, separate means for yieldingly pressing the upper rolls upon the lower rolls, and a connection between each of said means and each end of an upper roll, adapted to be turned on its axis in a horizontal plane, each of which connections has an extension above said upper rolls forming a foot and also forming means whereby it is adapted to be turned with respect to the rolls and with respect to said pressing means, each block having a surface adapted to engage and support said foot when said foot is turned with respect to said rolls, as described.

5. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, boxes for the upper rolls, rests upon the supporting-blocks substantially in line with the surfaces of the boxes, separate means for yieldingly pressing upon the boxes of the upper rolls whereby they are caused to bear against the lower rolls, and a coupling between said means and the boxes of the upper rolls and the rests upon the supporting-blocks, which couplings are adapted to engage the boxes or the rests, according as they may be turned and without disengagement from the said means for exerting pressure or movement thereof.

6. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, boxes for the upper rolls, a weight hung on each box, and a connection between the weight and the box consisting of a rod extending from the weight by one side of the box and turned at its upper end to provide a projection or foot to bear upon the upper surface of said box, which rod is adapted to be turned in the weight and with respect to the box from an engaging position therewith to a position at one side thereof, each block



being provided with means located at the side of its box to receive said foot when turned as set forth.

7. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, boxes for the upper rolls, an independent weight for each box, a rest for each weight, and means connecting each weight with a rest, adapted to be moved without being disengaged from the weight and without changing the position of the weight to connect the weight either with the box or with the rest.

8. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, boxes for the upper drawing-rolls, rests upon each side of said boxes, a weight for each box and rest, means for engaging the weight with the box, and further means for holding said connecting devices in engagement with the boxes.

9. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, and a weight coupled to the end of each upper roll by a coupling which is movable horizontally to engage said upper roll without being disengaged from the weight, and means for supporting said coupling when disengaged from said upper roll.

10. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, and a weight, and means whereby it is coupled to the end of each upper roll, said weight being adapted to turn independently of said coupling means, said coupling means being adapted to turn horizontally independently of said weight to release said upper roll as described, and a rest adapted to receive and support said coupling means when it has been turned from engagement with said upper roll.

11. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, a weight coupled to the end of each upper roll, and means connecting the weight with the coupling whereby the coupling may be turned in the weight and the weight moved horizontally to engage and disengage it.

12. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, a weight adapted to be coupled to the end of each upper roll, a weight-coupling, and an adjustable collar attached to the coupling within the weight, said weight-coupling being also adapted to be turned from engagement with said upper roll to a position out of engagement therewith, as described.

13. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, a weight adapted to be coupled to the end of each upper roll, and weight-coupling, each weight having a hole extending across it the upper surface of which is

slightly inclined and from which extends upward a recess open at one side as described.

14. In a drawing-frame or similar machine, roll-stands comprising a number of horizontal supports, roll-bearing blocks mounted upon said supports to be horizontally adjustable thereon, the said blocks being arranged to overhang their supports, one or more weights for each block, and couplings connecting said weights with said blocks and the rolls carried thereby, which couplings extend through the overhanging portions of the blocks.

15. In a drawing-frame or similar machine, roll-stands comprising a number of horizontal supports, independent blocks mounted upon said supports to be horizontally adjustable thereon, rolls supported by said blocks, weights coupled to said blocks to be movable vertically thereon and horizontally therewith, and also adapted to be connected with or disconnected from the rolls without removal from the blocks.

16. In a drawing-frame or similar machine, the roll-stands comprising a number of supports, independent blocks mounted upon said supports, each provided with overhangs, vertical holes in the overhangs of said blocks upon the back side thereof, weights below said blocks, rods extending from said weights through said holes and having locking extensions at their upper ends, and rolls carried by said blocks with which said locking extensions are adapted to be engaged or disengaged without removal of the rods from the blocks.

17. In a drawing-frame or similar machine, the blocks of the roll-stand, rolls mounted in said blocks, couplings carrying weights, said couplings passing up through said blocks and adapted to engage or disengage said rolls, each coupling being also adapted to engage the edge of its block upon any excess of movement of the upper roll, as described.

18. In a drawing-frame or similar machine, the blocks upon the roll-stand, rolls carried by the blocks, means for communicating pressure to the rolls, attached to the blocks, and a stop on the block to receive and hold the roll-pressure at given positions on the upper roll.

19. In a drawing-frame or similar machine, the roll-stands comprising horizontal supports, independent roll-blocks mounted thereon to be horizontally adjustable, rolls carried by said blocks, roll-pressure-applying devices mounted in said blocks to be movable therewith, and having a limited independent movement in relation thereto, and means horizontally movable with them, for preventing or lessening the rocking movement of the upper roll.

20. In a drawing-frame or similar machine, a roll-stand comprising a horizontal support, independent blocks mounted upon said stand and extending beyond the edges thereof to



provide a long bearing or support for the rolls, said extensions being provided with holes passing through their sides, the under roll supported by said blocks, boxes mounted in said blocks extending from the end of said blocks and providing long, independent bearings for the upper rolls, weight-coupling rods extending through the holes in the box extensions, weights attached to the rods, and means for connecting and disconnecting the coupling-rods with the roll-boxes.

21. In a drawing-frame or similar machine, the roll-blocks, the rolls carried thereby, the weight-couplings having ends above the blocks, movable to engage the rolls or the blocks, their weights, and movable locking bars or plates to engage and hold the ends of the couplings.

22. In a drawing-frame or similar machine, the roll-blocks, the rolls, the weights, the weight-couplings having ends extended above the rolls, a cover for the rolls, and locking means upon the under side of the cover to hold the weight-couplings from turning.

23. In a drawing-frame or similar machine, the roll-stand, the blocks upon the roll-stand extending laterally from the edge thereof, said extensions being provided with coupling-holes, rolls carried by the blocks, weight-coupling rods extending through the holes in the blocks and housed or protected by them and the stand, means to engage the couplings with the rolls, and means for exerting stress upon the coupling-rods.

24. In a drawing-frame or similar machine, the roll-stand, blocks upon the roll-stand arranged to telescope one within the other whereby thickened sections may be secured, said thickened sections having holes adapted to receive weight-couplings, the rolls, the weight-couplings passing through said holes, and the weights.

25. In a drawing-frame or similar machine, the roll-stands comprising a number of horizontal supports, roll-bearing blocks mounted upon said supports to be horizontally adjustable thereon and having extensions from the sides thereof, rolls supported by said blocks, boxes for the upper rolls which extend outward from the ends of said blocks, a roll-pressure-applying device attached to said blocks and adapted to engage said boxes at or near the center of their length, and means for applying pressure to the couplings.

26. In a drawing-frame or similar machine, the combination of the drawing-rolls, supports for the same relatively horizontal, adjustable means for applying pressure to and releasing it from the rolls combined with said roll-supports to be movable horizontally therewith without modifying either its engaged or disengaged relation with the drawing-rolls and without releasing it from said supports.

27. In a drawing-frame or similar machine, the roll-stands comprising a number of horizontal supports, a number of roll-bearing blocks mounted upon said supports to be horizontally adjustable thereon, the rolls carried by said blocks, weights, weight-couplings secured to said supports to be horizontally adjustable therewith and having extensions above the blocks adapted to be moved into engagement with the rolls, and means for preventing the couplings from becoming disengaged from the rolls whatever their horizontal position may be comprising two plates or flanges, one on each side of the coupling connections.

28. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, and weights each adapted to be coupled to the end of one of said upper rolls, each weight-coupler being adapted to rest on the upper roll-supporting block and be turnable in a horizontal plane to release said supporting-block and its roll and each weight being adapted to turn with relation to said coupling whereby said coupling may be turned to release the roll without vertical movement and without moving its weight.

29. In a drawing-frame or similar machine, the lower and upper drawing-rolls, their supporting-blocks, a weight adapted to be coupled to the end of each roll, and a weight-coupling, said weight resting upon a portion of said coupling and being slidably connected therewith, and said weight being chambered the upper surface of the chamber therein slanting from one edge to the other thereof and being slotted for a portion of the width of the weight whereby said weight-coupling will hold said weight centrally as described.

30. In a drawing-frame or the like, the roll-stand having blocks, an upper and an under roll, each mounted at each end in one of said blocks, weights and their couplings, each adapted to act on one end of said upper roll and free to move upwardly therewith, and means to limit the downward movement of each coupling whereby when said upper roll rocks the falling end may be relieved of any pressure thereon from its weight, and the rising end will receive the unbalanced pressure from its weight, as set forth.

31. In a drawing-frame or the like, a roll-stand, an upper and under roll, and means whereby they are supported, and means whereby each end of said upper roll is weighted, and means whereby each end of said upper roll when rocking is freed from the action of its weight when said end has fallen below a predetermined position, as set forth.

LOREN W. PENNEY,

In presence of—

CHARLES MILLS,

OSCAR E. NUTTER.