

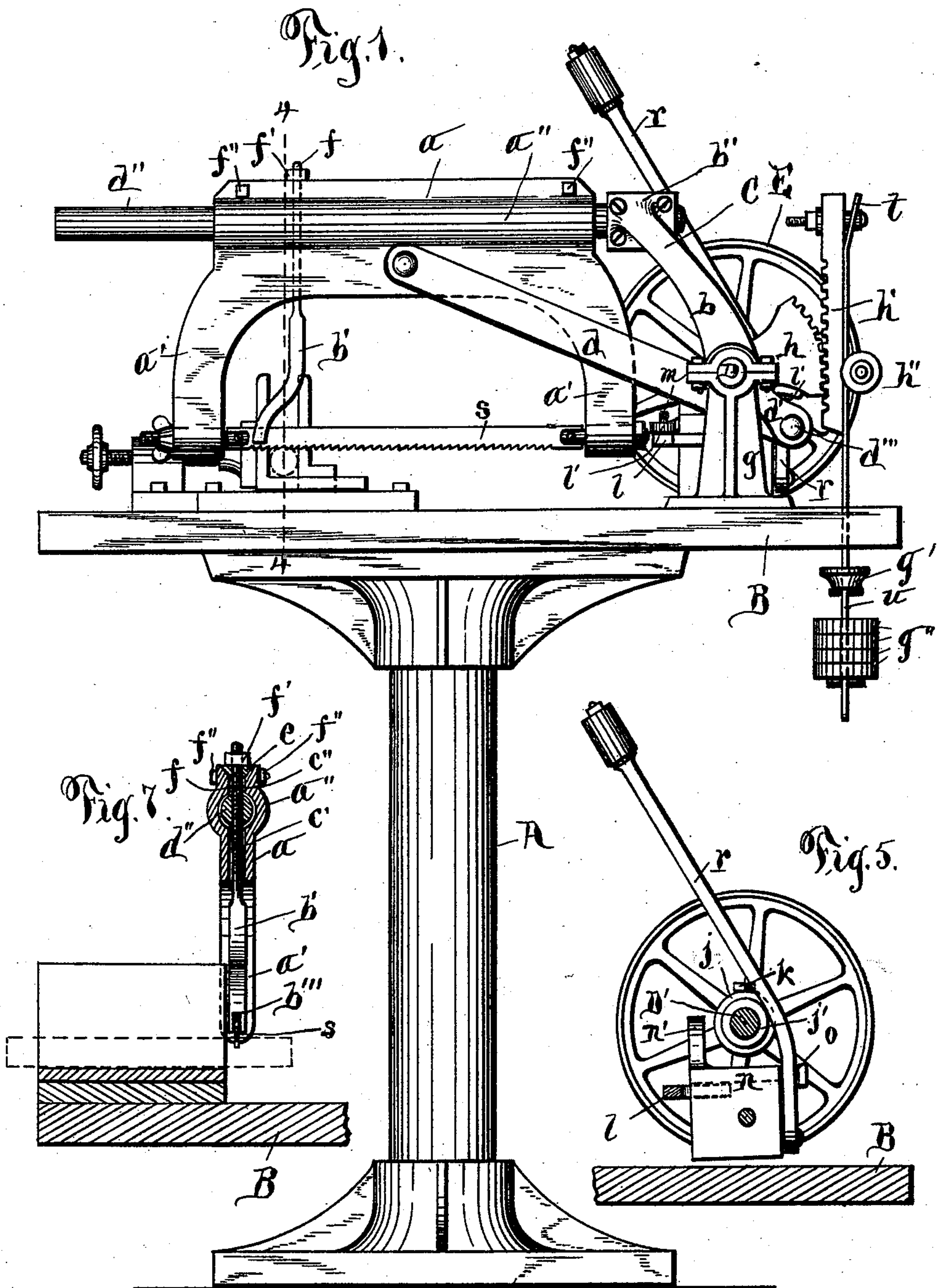
(No Model.)

3 Sheets—Sheet 1.

J. & R. J. BALZ.
METAL SAWING MACHINE.

No. 539,246.

Patented May 14, 1895.



WITNESSES:

C. L. Bendixen

J. J. Laass

INVENTORS:

John Balz
and Robert J. Balz
By C. Laass
their ATTORNEY

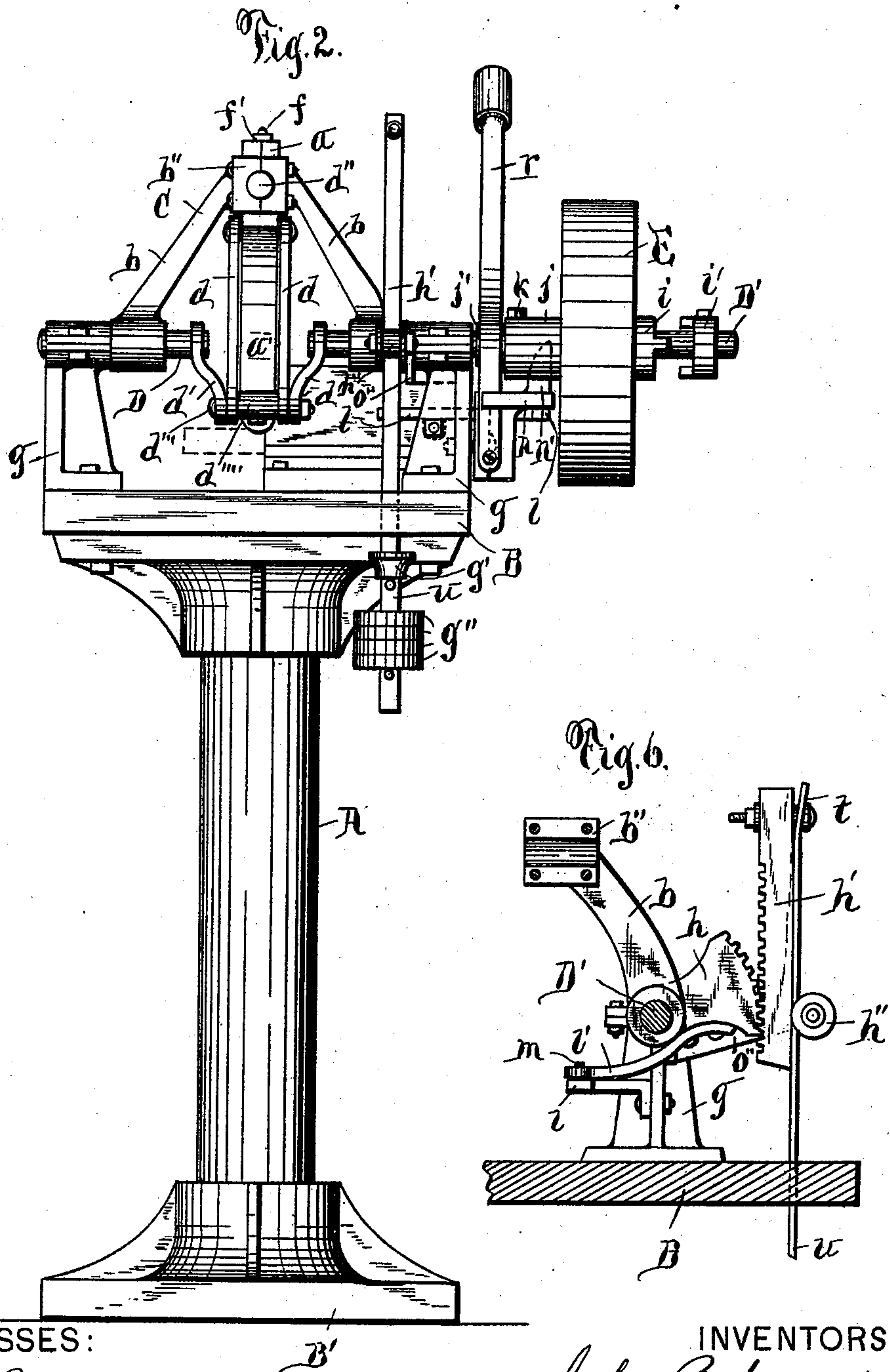
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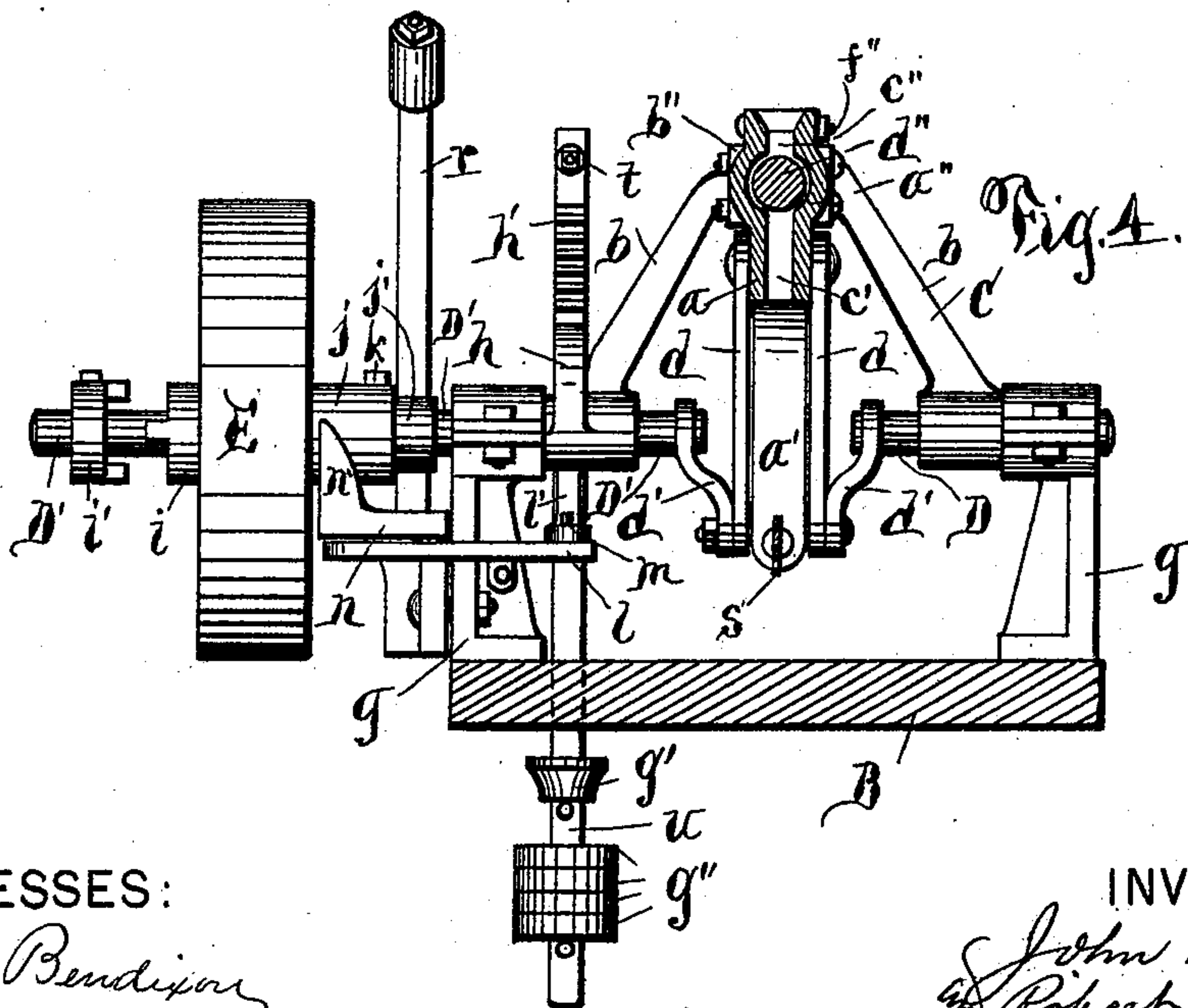
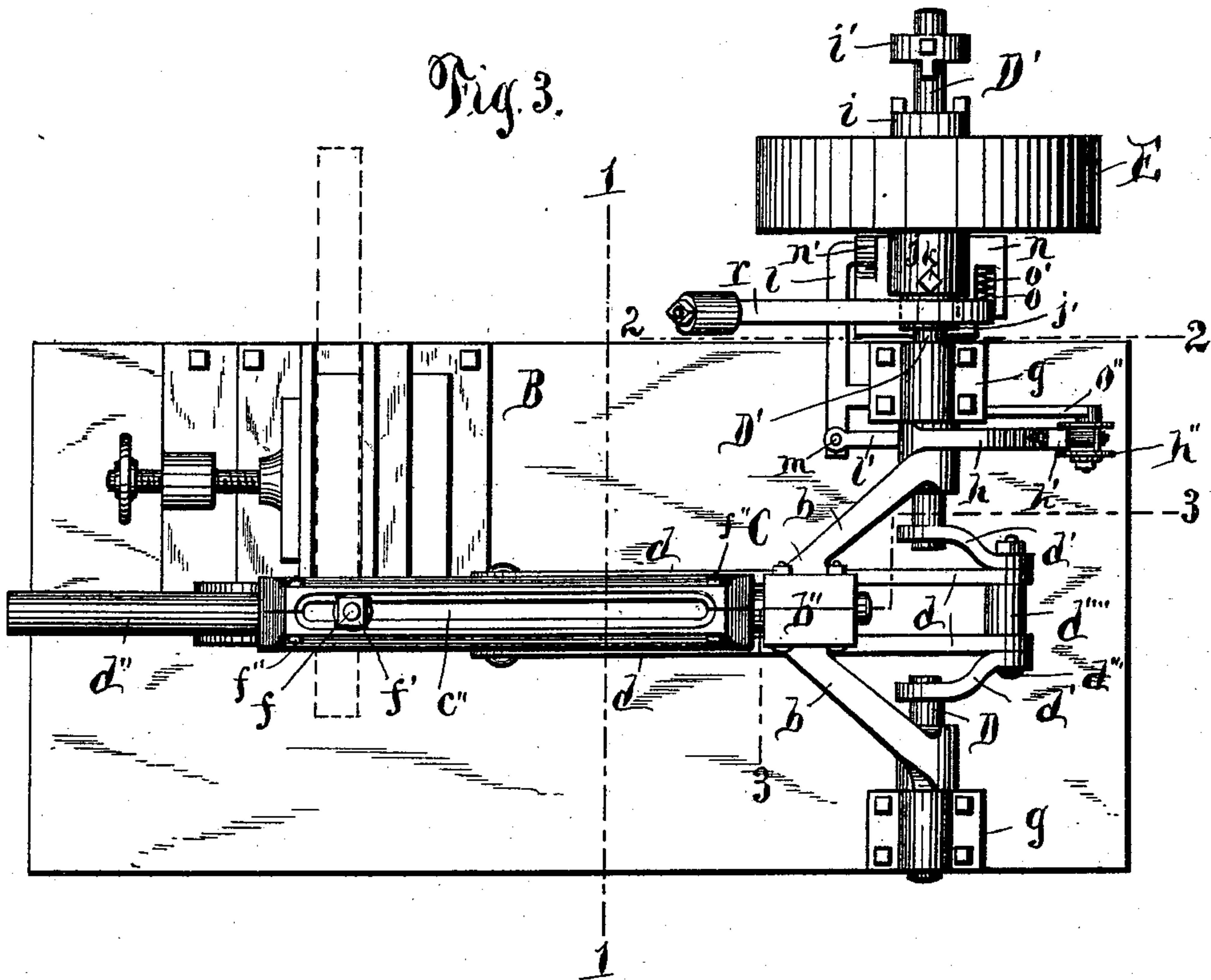
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UNITED STATES PATENT OFFICE.

JOHN BALZ AND ROBERT J. BALZ, OF SYRACUSE, NEW YORK.

METAL-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 539,246, dated May 14, 1895.

Application filed October 3, 1894. Serial No. 524,777. (No model.)

To all whom it may concern:

Be it known that we, JOHN BALZ and ROBERT J. BALZ, of Syracuse, in the county of Onondaga, in the State of New York, have
5 invented new and useful Improvements in Metal-Sawing Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to the class of sawing machines which have a reciprocating saw termed drag-saw and designed more specially for sawing metal.

15 The object of the invention is to produce a machine which shall be simple in construction, efficient in its operation, easily controlled and which shall automatically cease to operate when the material is sawed through.

20 The invention consists in providing a suitable supporting frame (which in this case is of the form of a table) with a suitable pair of shaft supports, two shafts axially in line, one in each support, a bracket mounted loosely on the inner ends of said shafts, a pulley
25 loosely mounted on one of said shafts, a reciprocating saw-carrying frame sliding on said bracket and suitable connections between said parts; and the invention also consists in the improved details of the construction of the machine as hereinafter described
30 and shown in the annexed drawings, in which—

Figure 1 is a front view of the improved machine. Fig. 2 is an end view of the same.
35 Fig. 3 is a plan view. Fig. 4 is a sectional view taken on line 1 1 in Fig. 3. Fig. 5 is a view taken on line 2 2 in same figure. Fig. 6 is a view taken on line 3 3, also in Fig. 3; and Fig. 7 is a view taken on line 4 4 in Fig.
40 1, showing the construction of the saw-carrying frame and saw-guide hereinafter described.

Referring by letter to the several parts of the improved machine: —A— is a post or
45 pillar of a table having the cap or table —B— on its top and provided with the base —B'— by which it is sustained upright, said parts forming the main-supporting frame of the machine. The cap of said frame has mounted
50 upon it the usual pillow-blocks —g—g— in which are journaled respectively the shafts —D—D'— which are axially in line and are

connected at their inner ends by means of two cranks —d'—d'— secured together by a crank-pin —d'''— or said connection may be
55 made by a double crank. Upon said shafts is loosely mounted a bracket —C— having a rod —d''— extending therefrom over the line of sawing and upon said rod slides the reciprocating saw-carrying frame —a— having
60 two downwardly extending arms —a'—a'— in which the saw —s— is held. Said bracket is formed of two upwardly converging arms —b—b— forming two braces terminating at their junction with a box —b''— in which is
65 held the aforesaid rod —d''—.

The saw-carrying frame —a— is formed with a cylindrical portion —a''— in its main portion for the reception of the rod —d''—,
70 guides —c''—c'— extending respectively from the upper and lower edges thereof to said cylindrical portion through which the saw-guide —b'— passes and is screw-threaded in its upper portion by which it is secured to
75 the rod —d''—.

In the upper portion of the upper guide —c''— which is preferably V shaped slides a correspondingly shaped block —e— through which the screw threaded portion —f— of the
80 saw-guide passes and a nut —f'— on the upper end of said saw guide and bearing on said block holds the same in the V shaped portion of the guide —c''— as shown in Fig. 7 of the
85 drawings, and the upper portion of said saw-carrying frame is split longitudinally and is provided with screws or bolts —f''— to take
up the wear on the aforesaid cylindrical portion thereof. The lower end of said saw-guide
90 is provided with a vertical slot or notch —b'''— through which the saw slides as clearly shown in Fig. 7 of the drawings.

To the main frame is secured a vise which may be of any well known form to hold the material to be sawed, and it is therefore not
95 necessary to describe the same. It is also unnecessary to describe the manner in which the saw is held in the saw-frame as this is also a well known construction and any suitable means may be employed for the purpose.

Pivoted to opposite sides of the saw-carrying frame —a— and extending rearward to the aforesaid cranks —d'—d'— are two parallel bars or pitmen —d—d—, by means of which bars and cranks reciprocating motion

is transmitted from the shafts to said frame, said cranks and bars being firmly held together by means of a block —*d''''*— between said bars and crank-pin —*d'''*— passing through all of said parts as clearly shown in Figs. 2 and 3 of the drawings.

—*E*— represents the driving pulley which is loosely mounted on the shaft —*D'*— and has affixed to it a clutch-member —*i*— adapted to engage a companion clutch-member —*i'*— secured to said shaft. The throwing of said pulley and its clutch-member into and out of engagement with the shaft clutch-member is performed by the following mechanism: Below the hub —*j*— of said pulley and pivoted to the pillow-block —*g*— is a plate —*n*— having formed thereon the cam —*n'*— and adapted to be tilted toward and from said hub as hereinafter described, and in said plate is a guide or slot —*o*—. Said hub is provided with a lug —*k*— on its periphery and a collar —*j'*— of smaller diameter than the hub is formed thereon. Pivoted to said cam-plate is a weighted lever —*r*— which passes through said guide *o* and by gravity lies on the collar —*j'*— and bears against the hub proper when the pulley with its clutch-member is out of engagement with the shaft-clutch member and by pushing the lever rearward, the pulley-clutch member is brought in contact with the shaft-clutch member and the machine is in its operative position. The lever is forced back to its normal position, but lying on the shaft and against said collar to hold the pulley in said position by a spring —*o'*— seated in the guide or slot —*o*— and bearing against said lever as clearly shown in Fig. 3 of the drawings. By raising the lever when the pulley is in said position the plate —*n*— with its cam —*n'*— thereon is tilted toward the hub —*j*— of the pulley and the aforesaid lug —*k*— on the hub striking the cam throws the pulley away from the shaft clutch member thereby stopping the operation of the machine, and the lever is forced back as aforesaid to its normal position and again by its gravity lies on the collar and the pulley is free to turn on the shaft —*D'*—.

The stopping of the machine automatically when the material is sawed through is performed by the following mechanism: To one of the arms —*b*— of the bracket —*C*— is secured a toothed segment —*h*— engaging a vertically movable ratchet-bar —*h'*— having a downward extension —*u*— extending through a slot in the top of the main frame on the lower portion of which are secured weights —*g''*— to regulate the pressure of the saw on the material to be sawed, and an adjustable stop —*g'*— thereon bearing against the under side of the top —*B*— of the main frame to limit the downward movement of the saw-carrying frame —*a*— supported on the rod —*d''*— of said bracket. Pivoted to the aforesaid pillow-block —*g*— is a short lever —*l*— bearing

with its rear end under the aforesaid cam-plate —*n*— and secured to the aforesaid segment is a bar —*l'*— having an adjusting pin or screw —*m*— by which it bears on the opposite end of said lever, and when the saw-carrying frame —*a*— has reached a certain point in its downward movement (regulated by the stop —*g'*—) the bar pushes said end down and the rear end bearing on the under side of the plate —*n*— with its cam —*n'*— as aforesaid, thereby tilting the same toward the hub —*j*— and said cam in the path of the lug —*k*— on the hub and the lever —*r*— is thereby raised from the shaft by reason of its being pivoted to said cam-plate as aforesaid and by said lug striking the cam, the pulley —*E*— with its clutch-member —*i*— is thrown away from the shaft-clutch member —*i'*— and the collar —*j'*— on the hub of said pulley is permitted to slide under the lever as shown in Fig. 3 of the drawings. By raising the saw-carrying frame which thereby moves the bracket —*C*—, the segment —*h*— and the bar —*l'*— secured to said segment, the plate —*n*— is relieved from pressure of the lever —*l*— and the weighted lever —*r*— pivoted to said plate by its gravity falls into its normal position lying on the collar —*j'*— and thereby tilts said plate with its cam away from the hub of the pulley —*E*— and out of the path of the lug —*k*—, and the pulley with its clutch-member is free to again be thrown toward the shaft-clutch member to again start the machine.

To any suitable portion of the main frame is secured a suitable support —*o''*— on which is a roller —*h''*— forming a bearing for the ratchet-bar —*h'*— and bears against the side thereof opposite the segment. On the upper end of said bar is another stop —*t*— which may be of any suitable form and is adapted to come in contact with the roller —*h''*— to limit the upward movement of the saw-carrying frame more clearly shown in Fig. 1 of the drawings.

What we claim is—

1. In a metal sawing machine, the combination with the main supporting frame, of the driving shaft mounted thereon, a pulley on said shaft, an upright bracket loosely mounted on said shaft, a rod extending from said bracket a reciprocating saw-carrying frame sliding on said rod, a saw-guide extending through said frame and secured to said rod and suitable connections between the shaft and saw-carrying frame as set forth and shown.

2. In a metal sawing machine, the combination with the main supporting frame, of supports thereon, two shafts axially in line, one journaled in each support, a pulley on one shaft, a movable upright bracket loosely mounted on the inner end portions of said shafts, a rod extending from said bracket a reciprocating saw-carrying frame sliding on said rod, a saw-guide extending through said

frame and secured to the rod and suitable connections between said shafts and frame as set forth and shown.

3. In a metal sawing machine, the combination with the main supporting frame, of a pair of supports thereon, two shafts axially in line, one journaled in each support, a pulley on one shaft, an upright bracket loosely mounted on the inner end portions of said shafts, a rod extending from said bracket, a reciprocating saw-carrying frame sliding on said rod, a saw-guide passing through said saw-frame and secured to the rod, and suitable connections between said shafts and saw-carrying frame as set forth and shown.

4. In a metal sawing machine, the combination with the main supporting frame, of a pair of supports thereon, two shafts axially in line, one journaled in each support, an upright bracket loosely mounted on the inner end portions of said shafts, a rod extending from said bracket, a reciprocating saw-carrying frame sliding on said rod, cranks connecting the inner ends of said shafts and pitmen connecting the saw-carrying frame to the cranks, and a saw-guide extending vertically through the saw-carrying frame and secured to the aforesaid rod inside of the frame as described and shown.

5. In a metal sawing machine, the combination with the main supporting frame, of a driving-shaft, a pulley loosely mounted thereon, a suitably supported saw-carrying frame, suitable connection between said frame and shaft, a manually operated lever to throw the pulley in operative position with the shaft and means to automatically throw the pulley out of said position as set forth.

6. In a metal sawing machine, the combination of two shafts axially in line suitably supported on the main frame, a pair of upwardly converging arms loosely mounted thereon, a box substantially as shown formed at their junction, a rod extending from said box, a reciprocating saw-carrying frame sliding on said rod, and suitable connections between said frame and shafts, as shown.

7. In a metal sawing machine, the combination with the main supporting frame, of supports thereon, a pair of upwardly converging arms loosely mounted thereon, a box substantially as shown formed at their junction, a rod secured in said box and extending therefrom over the line of sawing, a reciprocating saw-carrying frame sliding on said rod, a saw-guide secured to said rod, and suitable mechanism to operate said saw-carrying frame substantially as set forth and shown.

8. In a metal sawing machine, the combination with the main supporting frame, of a pair of supports, two shafts axially in line, one journaled in each support, a pulley on one shaft, a pair of upwardly converging arms on the inner end portions of said shafts, a rod extending from their junction, a reciprocating saw-carrying frame sliding on said rod and suitable connections between said frame

and shafts substantially as described and shown.

9. In combination with the main supporting frame, two shafts mounted thereon axially in line with each other, a pulley on one shaft, a bracket mounted loosely on the inner end portions of said shafts, a rod extending from said bracket, a reciprocating saw-carrying frame sliding on said rod, guides in said frame, a cylindrical portion in said frame for the reception of the aforesaid rod, a saw-guide extending through said guides and secured to said rod, cranks connecting the inner ends of said shafts and pitmen extending from opposite sides of the said frame to said cranks as described and shown.

10. The combination of the driving shafts —D—D'—, the bracket —C— loosely mounted thereon and having a rod —d''— extending therefrom, the reciprocating saw-carrying frame —a— sliding on said rod, a guide —c'— formed in the lower portion of said frame, a corresponding guide —c''— in its upper portion having the V shaped portion —e'— and correspondingly shaped block —e— sliding therein, a saw-guide —b'— screw-threaded in its upper portion extending through the saw-frame and through said lower guide and through the aforesaid rod —d''— and secured to the same, thence through the upper guide —c''— and through the aforesaid block —e—, and a nut —f— on its upper end as shown for the purpose set forth.

11. The combination with the main supporting frame, of two shafts axially in line supported thereon, a pulley on one shaft, an upwardly extending bracket mounted loosely on the inner end portions of said shafts, a rod extending from said bracket, a reciprocating saw-carrying frame sliding on said rod, suitable connections between said shafts and frame, a segment secured to said bracket and mechanism connected to said segment to counterweight the saw-carrying frame and limit the downward movement thereof as set forth and shown.

12. The combination with the main supporting frame, of supports thereon, two shafts axially in line journaled in said supports, a pulley on one shaft, a pair of upwardly converging arms extending from the inner end portions of said shafts, a box substantially as described and shown, formed at their junction, a rod extending from said junction, a reciprocating saw-carrying frame sliding on said rod, suitable connections between said frame and shafts, a toothed segment secured to one of said arms and a vertical ratchet-bar engaging said segment to counter weight the saw-carrying frame and limit the downward movement thereof as set forth and shown.

13. The combination with the main supporting frame, of supports thereon, two shafts axially in line journaled in said supports, a pulley on one shaft, a pair of upwardly converging arms extending from the inner end portions of said shafts, a box substantially as described

and shown formed at their junction, a rod secured therein and extending therefrom over the line of sawing, a reciprocating saw-carrying frame sliding on said rod, cranks connecting the inner ends of said shafts, pitmen extending from opposite sides of said frame to said cranks, and secured thereat, a saw-guide extending through said frame independently thereof and secured to the aforesaid rod, a toothed segment secured to one of said arms, a vertically movable ratchet-bar engaging said segment, a roller forming a bearing for said bar suitably supported on the main frame, weights on said bar a stop on its lower portion to limit the upward movement thereof, and a stop at its top portion to limit the downward movement for the purpose set forth.

14. The combination with the main supporting frame, of a driving shaft suitably mounted thereon, a bracket loosely mounted on said shaft and a pulley loosely mounted thereon, a reciprocating saw-carrying frame sliding on said bracket, suitable mechanism connecting said frame and shaft, and means to automatically throw said pulley out of gear for the purpose set forth.

15. The combination with the main supporting frame, of a pair of supports, two shafts axially in line, one in each support, a pulley on one shaft, a pair of upwardly converging arms mounted loosely on the inner end portions of said shafts, a rod extending from their junction, a reciprocating saw-carrying frame sliding on said rod, a saw-guide extending through said frame, independently thereof and secured to said rod, cranks connecting the inner ends of said shafts, pitmen connecting said saw-frame and cranks, and mechanism to automatically throw said pulley out of gear as described and shown for the purpose set forth.

16. The combination with the main supporting frame, of two shafts axially in line suitably supported thereon, a movable upwardly extending bracket substantially as described and shown loosely mounted on the inner end portions of said shafts, a rod extending therefrom, a reciprocating saw-carrying frame sliding on said rod, a saw-guide extending through said frame independently thereof and secured to said rod, a pair of cranks connecting the inner ends of the shafts, pitmen extending from opposite sides of said frame to the cranks and secured thereat, a toothed segment secured to or formed on said bracket, a suitably supported vertically movable ratchet-bar engaging said segment, an extension on the lower end of said bar, having weights thereon, stops respectively on the lower end of said extension and upper portion of the ratchet-bar to limit the upward and downward movement thereof, a pulley mounted loosely on one of said shafts and having a clutch-member thereon, a plate having a cam thereon pivoted to one of the shaft supports, and capable of being tilted toward and from the hub of the pulley, and normally away there-

from, a companion clutch-member secured to the shaft, and adapted to engage the aforesaid clutch-member, a lever pivoted to the same shaft support with one end bearing on the under side of said cam-plate, a bar secured to the aforesaid segment bearing on the opposite end of said lever to tilt said cam-plate toward the hub of the pulley, and a lug on said hub adapted to strike said cam to throw the pulley with its clutch-member out of engagement with the shaft clutch-member to automatically stop the operation of the machine as described and shown.

17. The combination of the driving shaft suitably mounted on the main supporting frame and having a clutch-member secured thereto, a pulley loosely mounted thereon having a companion clutch-member, a plate pivoted below said shaft and to its support having a cam formed thereon, a weighted lever pivoted to said cam-plate and holding the cam by its gravity normally away from the hub of said pulley, a collar formed on said hub and of smaller diameter than the hub and of greater diameter than the driving shaft, said lever being adapted to rest on the collar and against the end of the hub when the clutch-members are disengaged, and to rest on the shaft and bearing in the same manner against said collar when the said clutch-members are in engagement as shown for the purpose set forth.

18. The combination of the driving shaft having a clutch-member secured thereon and its support, a pulley loosely mounted on said shaft and having a companion clutch-member secured to its hub and a lug on the periphery of said hub, a plate pivoted to said support and having a cam formed thereon, and a guide therein a weighted lever pivoted to the lower portion of said plate and by gravity holding the cam away from the aforesaid lug on the hub, and movable sidewise in said guide to throw the pulley with its clutch-member into engagement with the shaft clutch-member to operate the machine, a spring in said guide to throw said lever back to its normal position, said lever being adapted to tilt the cam-plate toward the hub of the pulley in its rising movement by reason of its being pivoted as aforesaid, and the lug on said hub to strike the cam to throw the pulley and its clutch-member away from the shaft clutch-member as shown for the purpose set forth.

19. In a metal sawing machine, the combination of the driving shaft suitably supported on the main frame, a pulley thereon, a bracket substantially as described and shown loosely mounted on said shaft, and supporting the saw-carrying frame and adapted to swing thereon and carry therewith said frame, a toothed segment secured to or formed on said bracket, a plate pivoted to the shaft support and having a cam formed thereon and a guide therein, a lever pivoted to the lower portion of said plate holding the cam by its gravity normally away from the hub of the pulley, a

spring in said guide to hold said lever in its normal position, a lever pivoted to the shaft support with one end bearing on the under side of the cam-plate, a bar secured to the
 5 aforesaid segment and bearing on the opposite end of said latter lever, having an adjustment thereon as shown, a vertically movable ratchet-bar engaging said segment, a suitably supported roller bearing against said bar on
 10 the side thereof opposite the segment, a downward extension on said bar, an adjustable stop on said extension bearing against the underside of the top of the main frame, said extension extending through said top by
 15 means of a slot therein, a stop on the upper portion of said bar, and weights on the lower portion of extension as shown for the purpose set forth.

20 20. The combination of the support —g—, driving shaft —D'— journaled therein, a

plate —n— pivoted to said support having a cam —n'— formed thereon, a pulley —E— loosely mounted on said shaft, a lug —k— formed on the hub —j— of said pulley, a
 25 guide —o— formed in said plate, a weighted lever —r— pivoted to said plate and passing through said guide, a spring —o'— seated in said guide and bearing against the lever, a collar —j'— formed on the hub, a clutch-member —i— secured to said hub and a com-
 30 panion clutch-member —i'— secured to said shaft as shown for the purpose set forth.

In testimony whereof we have hereunto signed our names this 21st day of September, 1894.

JOHN BALZ. [L. S.]
 ROBERT J. BALZ. [L. S.]

Witnesses:

C. L. BENDIXON,
 J. J. LAASS.