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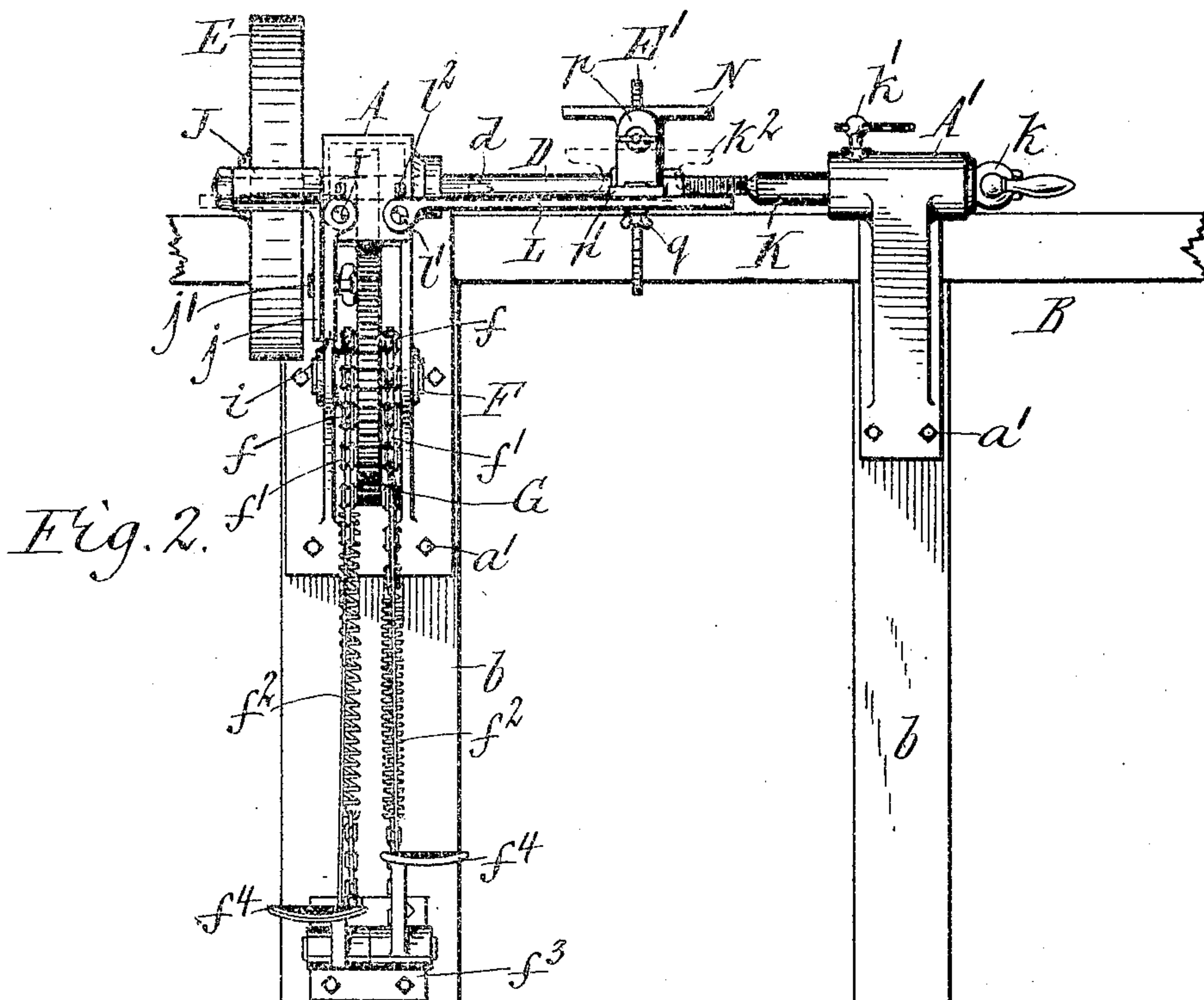
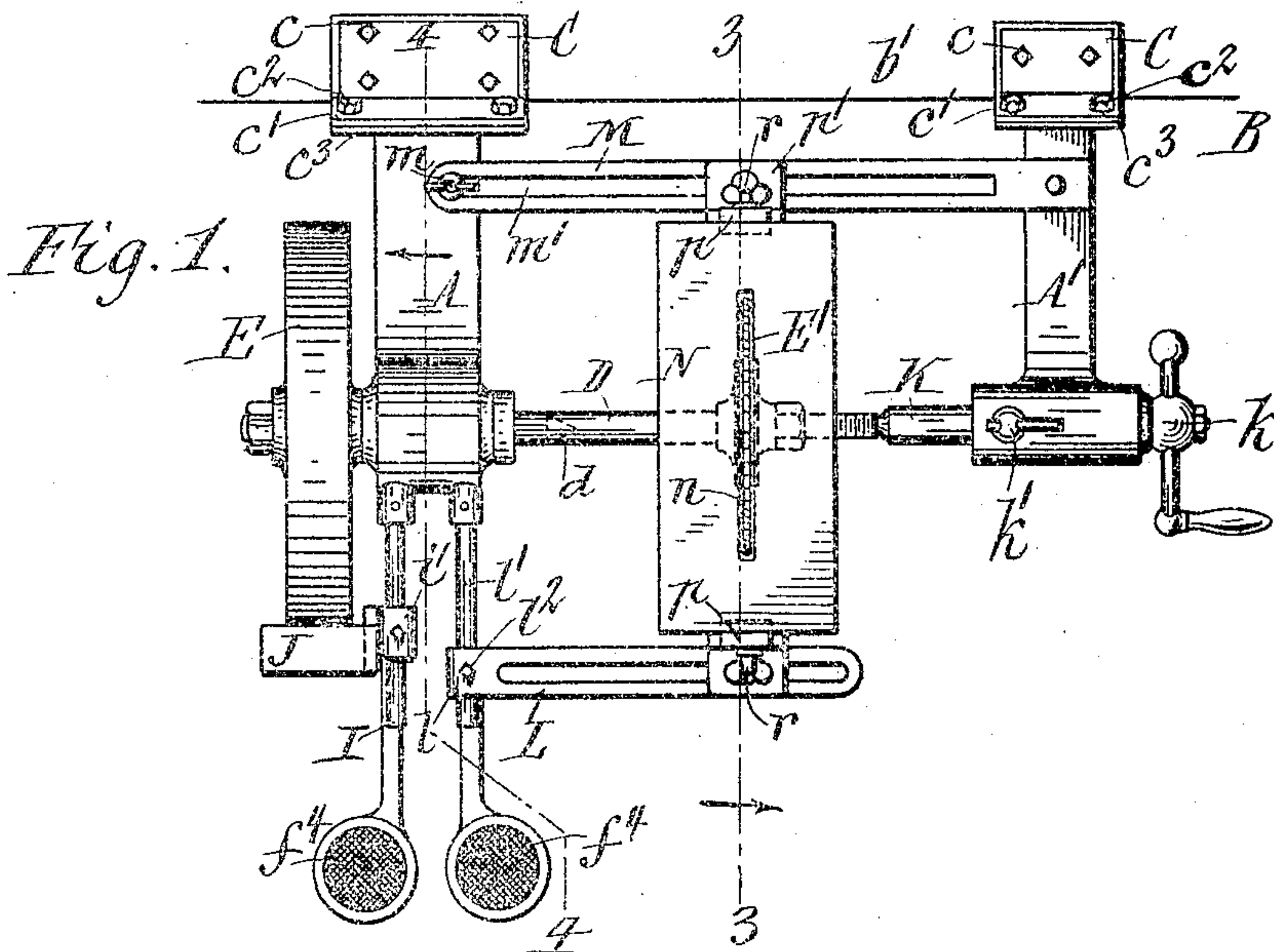
PATENTED JAN. 28, 1908.

H. E. O. SCHMIDT.

GRINDING, SAWING, AND TURNING MACHINE.

APPLICATION FILED APR. 6, 1905.

2 SHEETS—SHEET 1



Witnesses:
Louis W. Gratz
Emma M. Graham

Herbert E. O. Schmidt,
Inventor;
by Geyer & Popp
Attorneys.

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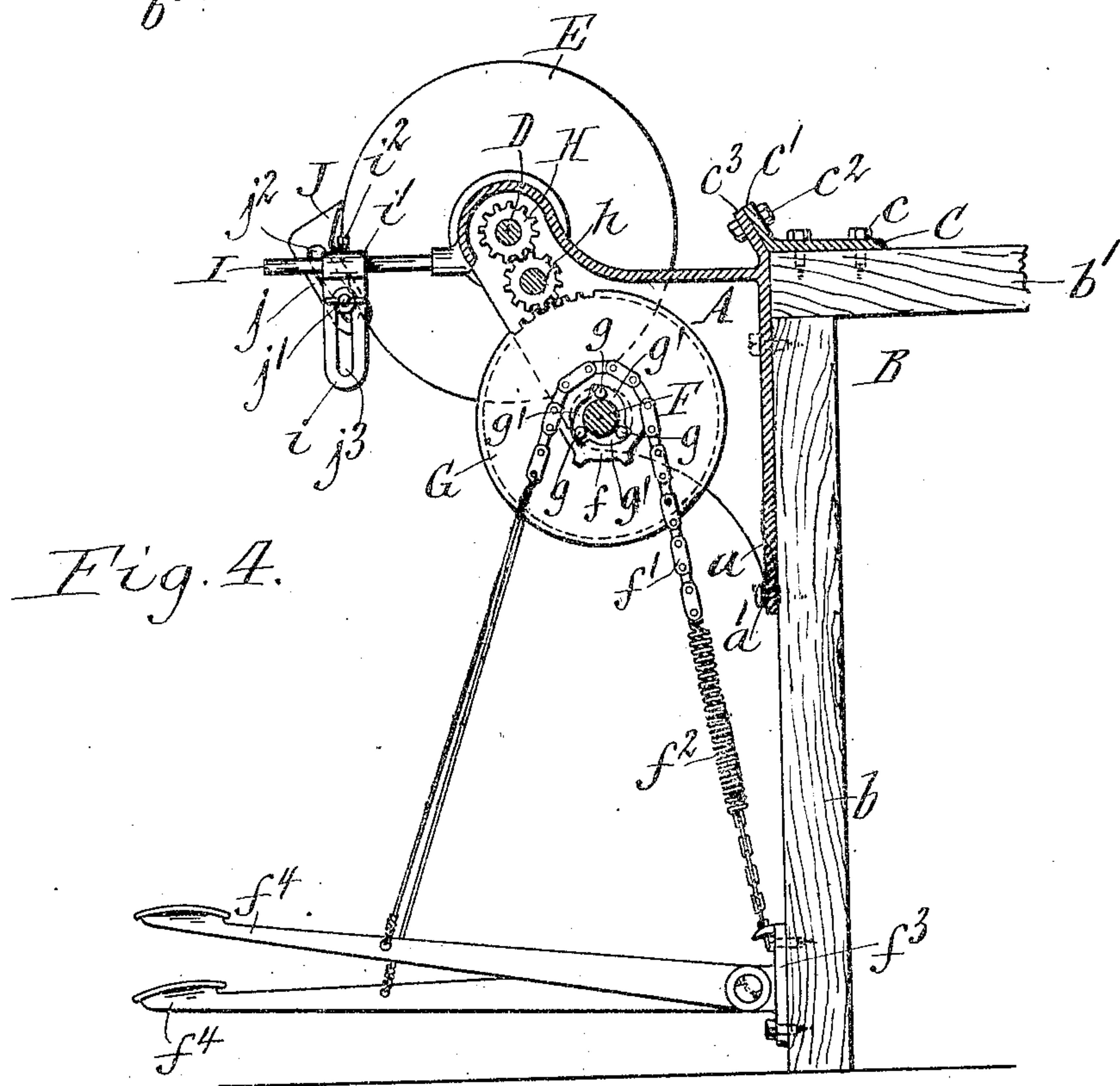
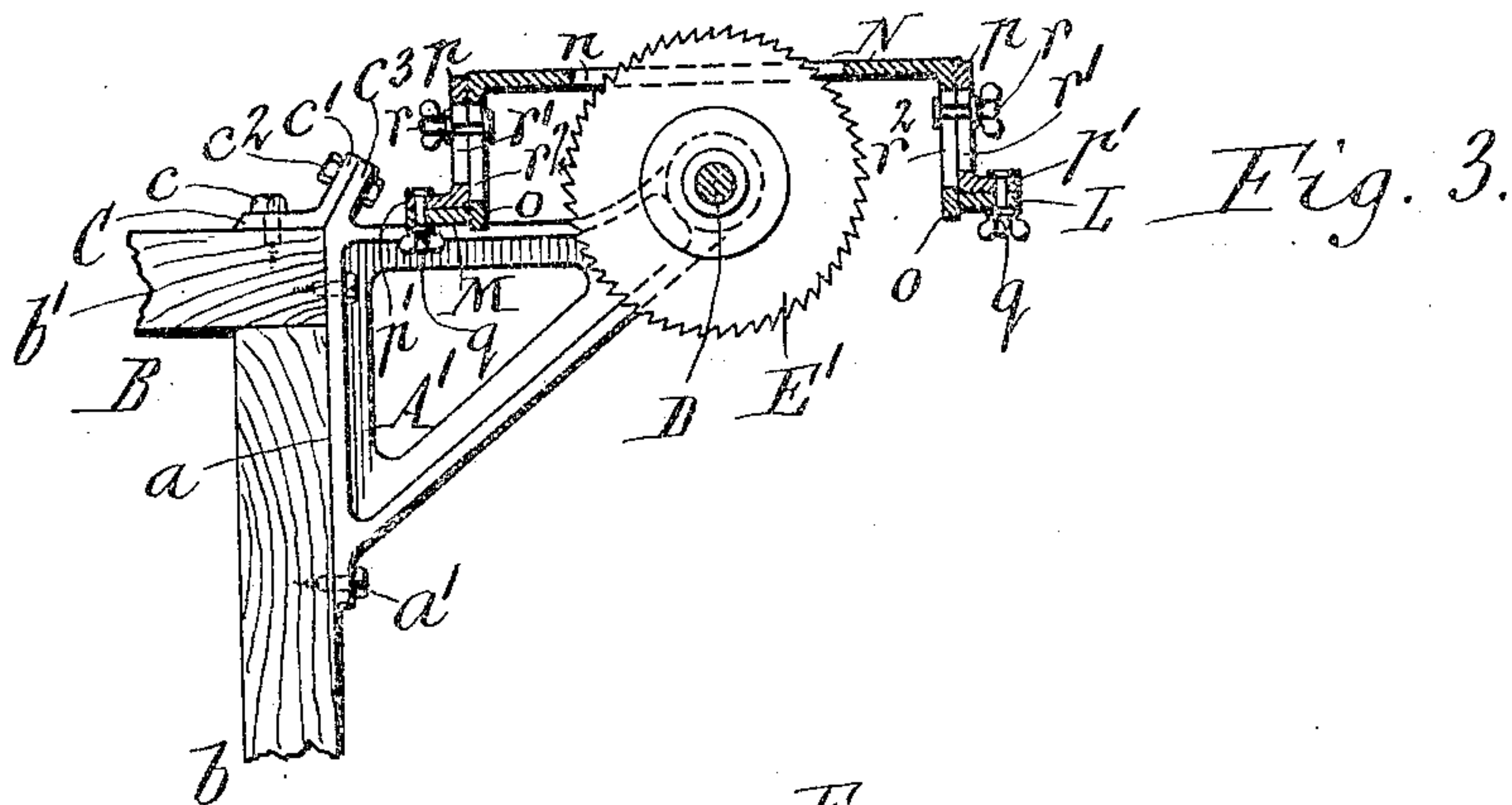
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UNITED STATES PATENT OFFICE.

HERBERT E. O. SCHMIDT, OF BUFFALO, NEW YORK.

GRINDING, SAWING, AND TURNING MACHINE.

No. 877,866.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed April 6, 1905. Serial No. 254,232.

To all whom it may concern:

Be it known that I, HERBERT E. O. SCHMIDT, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Grinding, Sawing, and Turning Machines, of which the following is a specification.

This invention relates to a combined grinding, sawing and turning machine which is simple and durable in construction and which can be readily adapted for the various uses mentioned.

In the accompanying drawings consisting of two sheets: Figure 1 is a top plan view of my improved grinding, sawing and turning machine. Fig. 2 is a front elevation thereof. Figs. 3 and 4 are vertical cross sections in lines 3—3 and 4—4, Fig. 1, looking in the direction of the arrows, respectively.

Similar letters of reference indicate corresponding parts throughout the several views.

A, A¹ represent the head and tail stocks or brackets of the machine each of which has a flat vertical face *a* at its rear end which is secured to the vertical side of a suitable support B by means of screws *a*¹ or similar fastenings. When these brackets or stocks are secured to the side or wall of a building or room the screws *a*¹ are the only means of fastening which are employed. But when the stocks are to be mounted on a table or bench each stock is secured with its vertical face *a* to the vertical front side or leg *b* of the bench and an additional fastening plate C is employed which is secured to the top *b*¹ of the bench by screws *c* and provided at its front end with a lug *c*¹ which is connected by bolts or screws *c*² with a lug *c*³ at the upper rear end of the bracket. The lugs *c*¹, *c*³ are arranged at an angle to the vertical front side and horizontal top of the table, as shown in Figs. 3 and 4, which permits of conveniently applying the bolts *c*² and also divides the lengthwise draw or pull of the same between the bracket and plate, thereby drawing the bracket tightly against the corner of the bench.

At its upper front end the head stock is provided with a bearing in which is journaled a horizontal live spindle D. The latter projects on opposite sides of the head stock and is provided on its left end with a grinding or polishing wheel E while its right end may be

of considerable length so as to serve as an arbor for a rotary disk saw E¹, as shown in full lines in Fig. 1, or this right end may be comparatively short and tapered, as shown by dotted lines *d* in Figs. 1 and 2, so as to serve as the live or head center of a lathe when it is desired to turn articles. This spindle may be turned by any suitable mechanism but preferably by the means shown in the drawings which are constructed as follows:

F represents an oscillating shaft journaled horizontally in the lower front part of the head stock, a pair of sprocket wheels *f*, *f* mounted loosely on this shaft, chain belts *f*¹ passing around the top of the sprocket wheels, springs *f*² connecting the rear lower ends of the chain belts with a bracket *f*³ on the support of the machine, and treadles *f*⁴ pivoted on the bracket *f*³ and connected with the lower front ends of said chain belts, respectively, as shown in Figs. 1, 2 and 4. Upon depressing either treadle the respective sprocket wheel will be moved forwardly and upon releasing the treadle its spring *f*² will raise the same and turn the sprocket wheel backwardly.

Between the two sprocket wheels a main driving gear wheel G is arranged and secured to the shaft F. This wheel is connected by clutches with the sprocket wheels so as to be compelled to move forward therewith but the sprocket wheels are free to move backwardly independent of the driving gear wheel. The clutches for this purpose shown in Fig. 4 of the drawings each consist of a plurality of balls or rollers *g* interposed between the periphery of the shaft F and cam-shaped recesses *g*¹ formed in the bore of the respective sprocket wheel. As each sprocket wheel turns forwardly the inclined faces of its recesses crowd the rollers against the shaft F and compel the same to turn with the sprocket wheel but during the backward movement of the latter the rollers release their grip on the shaft permitting the same to continue its forward movement independent of the sprocket wheel.

The rotary movement of the driving wheel is transmitted to the live spindle by a driven pinion H secured to said spindle D and an intermediate pinion *h* journaled on the head stock and meshing with the driving wheel and the driven pinion. The axes of these wheels are preferably all arranged on the

same line so that the power is transmitted from the driving wheel to the driven pinion in a direct or straight line, whereby cramping and hard running of said wheels is avoided and an easy working machine is produced. By depressing the treadles alternately the spindle D and the parts connected therewith may be rotated continuously and at a uniform speed. If desired this rotation may be produced by oscillating the treadles in unison or by oscillating but one of the treadles.

Means for supporting the tool or other article to be ground are provided and preferably constructed as follows: I represents a supporting rod or stem projecting horizontally forward from the left hand part of the head stock. i is an arm or rest having a sleeve i^1 at its inner end which is mounted on the rod I. This arm may be moved lengthwise of the rod I and swung into a horizontal position across the front of the grinding wheel, as shown by dotted lines in Fig. 2, for supporting the article to be ground. The arm i is held in position on the rod I by a set screw i^2 . For holding tools or articles tangentially to the periphery of the grinding wheel to bevel the same, a supplementary support or rest is provided consisting of a horizontal shelf J and an attaching shank j depending from the inner end of the shelf. When it is desired to use this supplementary rest the arm i is swung downwardly into a pendent position and the shank of the supplementary rest is secured thereto by a bolt j^1 passing through a longitudinal slot j^2 in said shank and a similar slot j^3 in said arm, as shown in Figs. 1, 2 and 4. By raising or lowering the supplementary rest or tilting the same on the arm i the shelf may be adjusted at different angles relatively to the grinding wheel as may be required by the article to be ground.

K represents a tail spindle or dead center which engages with the rear end of the live spindle when the same is long and carries the saw, as shown in Figs. 1 and 2, or the same may cooperate with a short live center for holding an article between them which is to be turned. This dead center or tail spindle is mounted horizontally in the tail stock in line with the live spindle and is adjusted thereon by a screw k and held in place after adjustment by a set screw k^1 .

When the machine is used for turning, an ordinary tool rest k^2 , shown by dotted lines in Fig. 2, is mounted on a horizontal bar L which is arranged lengthwise in front of the spindle center and provided at one end with a sleeve l which is adjustably mounted on a rod l^1 projecting forwardly from the right hand side of the head bracket and is held in place thereon by a set screw l^2 . When the front bar L is not in use the same can be swung downwardly on the rod l^1 out of the way.

For the purpose of adapting the machine

for turning articles which vary considerably in length either the head or the tail stock or both may be shifted on the table or support carrying the same to suit the work.

In order to enable the two stocks to be securely connected for stiffening the machine and still permit of adjusting the same toward and from each other, a bar M is provided which is arranged horizontally and lengthwise in rear of the spindle center and rigidly secured at one end to one of said stocks while its opposite end is adjustably connected with the other stock by a bolt or screw m passing through a longitudinal slot m^1 in said bar and into the last mentioned stock.

N represents a table for supporting articles while being sawed. This table is arranged horizontally and extends transversely across the spindle centers, a slot n being formed in the table through which the upper part of the saw projects, as shown in Figs. 1 and 3. The article to be cut is placed on this table and guided reliably thereon while being cut by the saw. Means are provided for enabling the table to be adjusted both vertically and longitudinally and adapt the same to the position of the saw on the live spindle and also to saws of different diameters and to permit of using spindles of different lengths. The preferred means for this purpose comprise two depending lugs o , o arranged at the front and rear ends of the table, and two coupling pieces. Each of the latter is of angular form and provided with a vertical web or flange p and a horizontal flange p^1 . The horizontal flange of each coupling piece is adjustably connected with the adjacent horizontal supporting bar by a bolt q passing through said flange and the slot of said bar and the vertical flange of the coupling piece is adjustably connected with the adjacent flange o of the table by a bolt r passing through slots r^1 , r^2 in said flanges. By loosening the bolts r and q of both coupling pieces the table may be adjusted both axially and radially relatively to the saw to suit the size and position of the latter.

My improved grinding, sawing and turning machine is particularly suited for shops doing a variety of work which however do not warrant the expense of installing and maintaining separate machines.

I claim as my invention:

A machine of the character described comprising a head stock, a tail stock, a live spindle journaled in said head stock, a dead center mounted on the tail stock and engaging with the live spindle, a saw mounted on the live spindle, a rear bar connecting said stocks and having a longitudinal slot, a front bar connected with the head stock and having a longitudinal slot, a table having a slot which receives said saw and provided at its ends with depending flanges each of which

has a vertical slot, and means for adjustably
connecting each end of the table with the
adjacent bar consisting of an angular coup-
ling piece having a vertical flange which is
5 slotted lengthwise and a horizontal flange,
a bolt connecting the vertical flange of each
coupling piece and one of the depending
flanges of the table and passing through the
slots thereof, and a bolt connecting the hori-

zontal flange of the coupling piece and the 10
adjacent bar and passing through the slot of
the latter, substantially as set forth.

Witness my hand this 29th day of March
1, 1905.

HERBERT E. O. SCHMIDT.

Witnesses:

THEO. L. POPP,
E. M. GRAHAM.