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W. Southwell.

Grinding & Polishing Saw Blocks.
N^o 8924.
Patented May 4. 1852

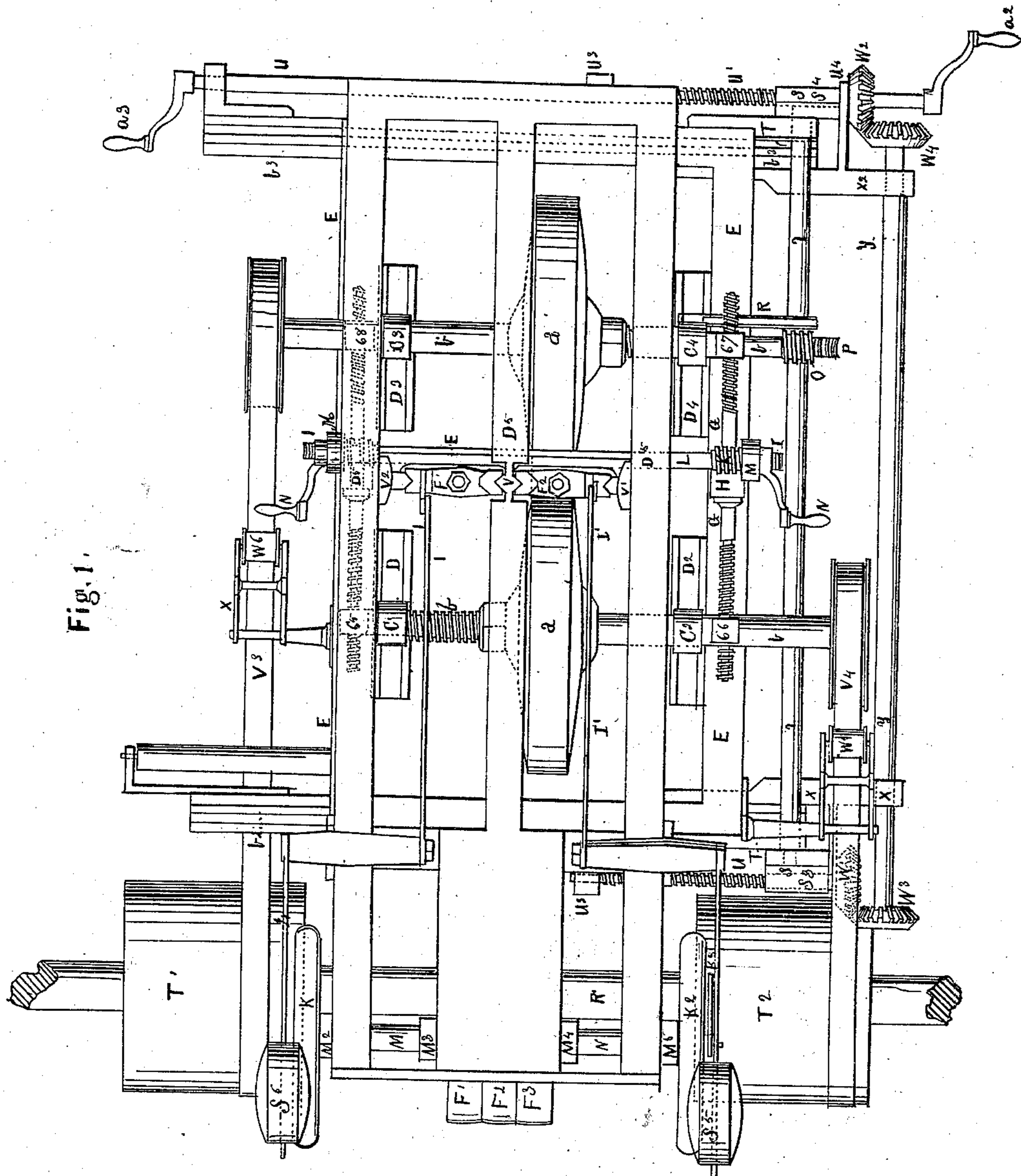


Fig. 1.

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Fig. 2

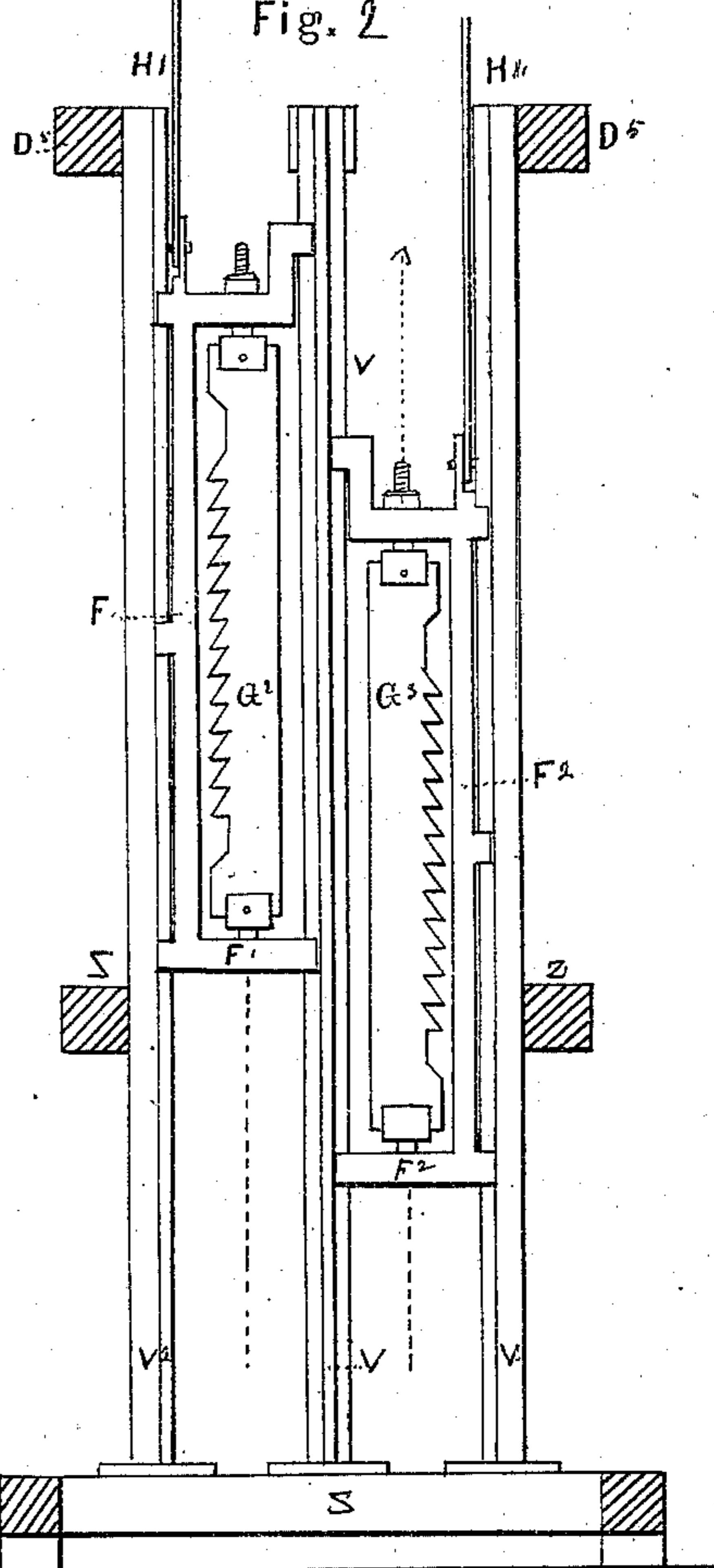
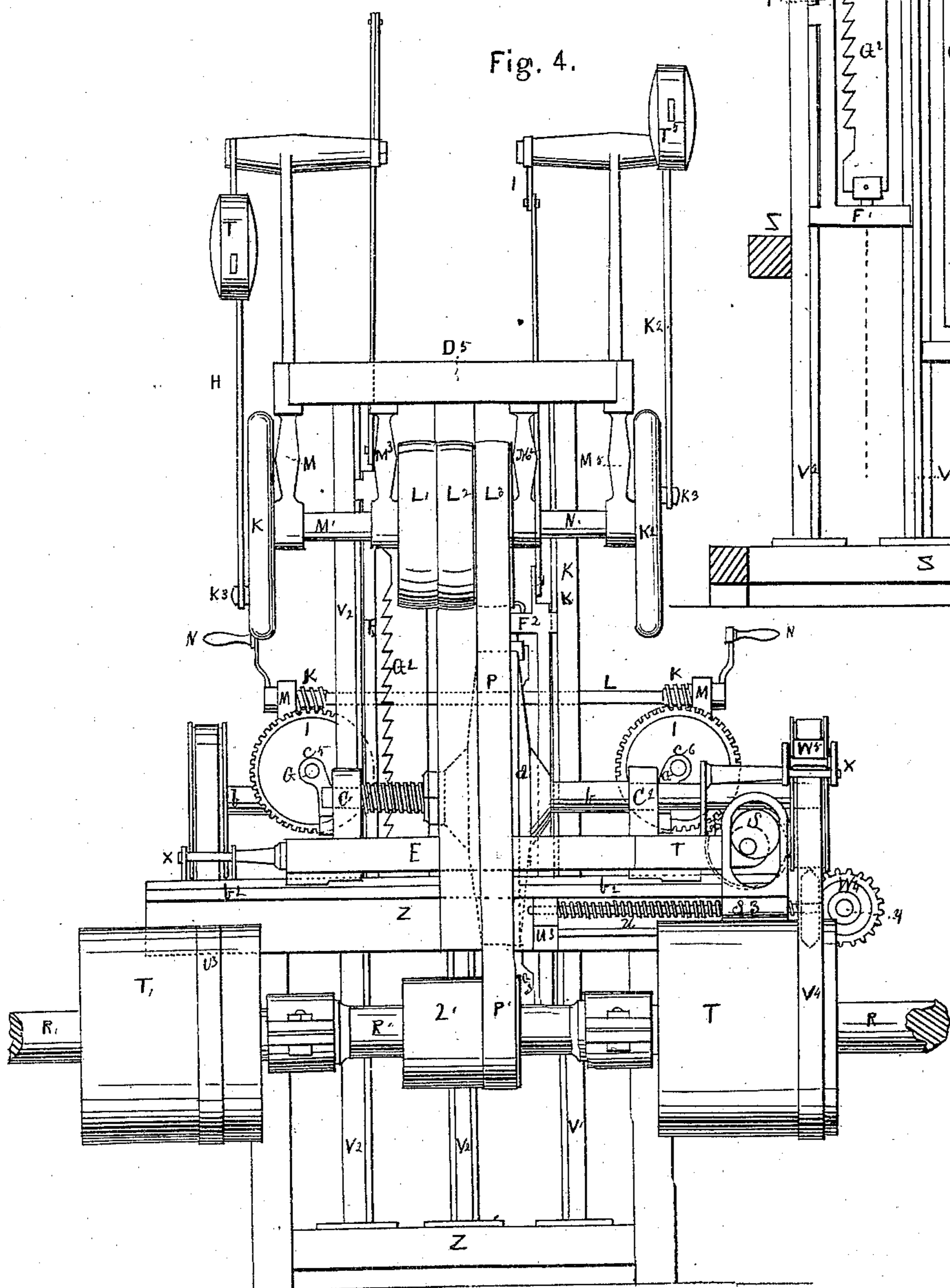


Fig. 4.

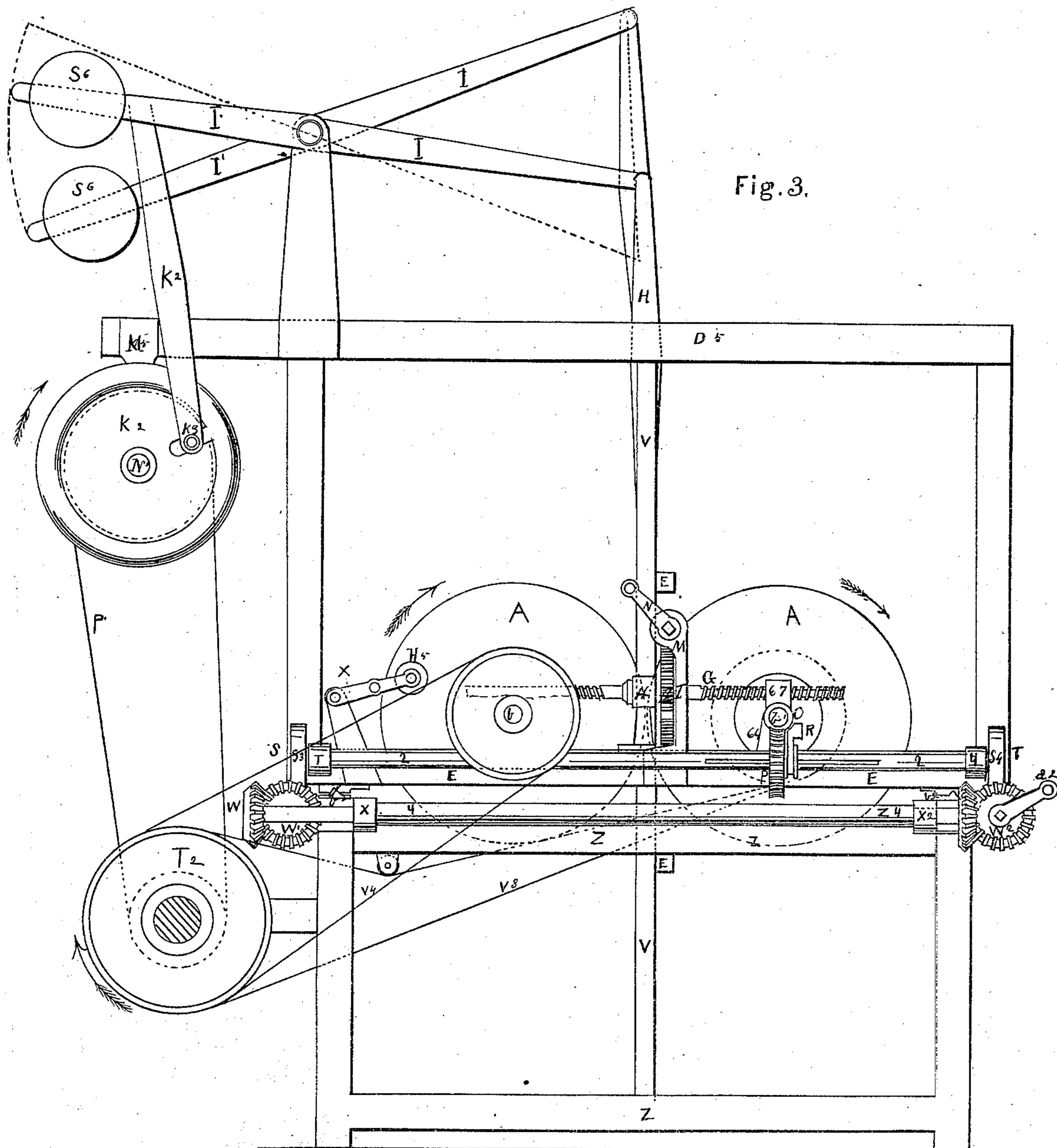


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UNITED STATES PATENT OFFICE.

WILLIAM SOUTHWELL, OF KENSINGTON, PENNSYLVANIA.

MACHINERY FOR GRINDING OR POLISHING SAW-BLADES, &c.

Specification of Letters Patent No. 8,929, dated May 4, 1852.

To all whom it may concern:

Be it known that I, WILLIAM SOUTHWELL, of Kensington, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Machine for Grinding or Polishing Saws and other Articles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, in which—

Figure 1 is a plan of machine. Fig. 2 is a transverse section of part of machine. Fig. 3 is a longitudinal elevation. Fig. 4 is a right end elevation.

Corresponding letters of reference are used in the different parts of the machine represented on the drawing.

This my invention consists in the mode of operating, with two grind stones, for the purpose of grinding or polishing saws, or other articles, at both sides at one and the same time.

A and A' represent two grind stones fixed firmly on the shafts *b* and *b'* in the usual way. The stones A and A' are directly opposite to each other, see Fig. 1.

C¹ C² C³ and C⁴, are four movable pedestals or boxes which carry the shafts *b* and *b'*. The under part of each box, C¹ C² C³ and C⁴ is planed and fitted, to slide in grooves or As planed in carriers D¹ D² D³ and D⁴, said carriers are bolted to the inside of sliding frame E, see Fig. 1. On the top of each box C¹ C² C³ and C⁴ is fixed a nut or carrier, C⁵ C⁶ C⁷ and C⁸, to receive the screw shafts G and G'.

E represents a movable or sliding frame, mounted upon planed slides *b*² and *b*³ said slides *b*² *b*³ are fixed to the upper beams of the main frame of machine, Z similar to the slides of a slide lathe.

H H are two carriers bolted on the top of frame E, to carry the screw shafts G and G'. On one end of screw shafts G and G' is formed a right hand screw, and on the other end of said screw shaft G G' is formed a left hand screw. The screws G and G' screw into the female screw nuts or carriers C⁵, C⁶, C⁷, C⁸.

I, I, are two worm wheels keyed on to screw shafts G G'.

K, K, are two worms, keyed on to shaft L. Said shaft L extends across the machine (Fig. 1) and is held by carriers M, M.

Said carriers are bolted to sliding frame E. The handles or "winches" N are fixed on each end of cross shaft L.

A rotary motion is communicated to the screws G and G', by the above described mechanism, being worked by the hand of the workman, for the purpose of moving the grind stones A and A' nearer to or farther from the article required to be ground or polished. Any degree of force may be applied, necessary to grind steel or other metals, by this arrangement, and the articles ground can be reduced to the most accurate gage, and even in thickness. The nuts or carriers C⁵, C⁶, C⁷, C⁸, are arranged and fixed to boxes C¹, C², C³, C⁴, so as to allow the position of stones A A' to be adjusted, or regulated that is to say, when a pair of new stones A A' are placed in the machine. It is necessary to have the outer surface or periphery of each stone A and A' equal distance from the article intended to be ground or polished, so that when the said stones A and A' are forced "up" to their work, each stone will have the same effect upon the article being ground or polished. Stone A will grind or polish one side of saw, and stone A' will grind or polish the other side of a saw, or other article at the one and same time.

O represents a worm keyed on one end of shaft *b'*.

P is a worm wheel placed on shaft Q, and is held by a feather key.

R is a carrier secured to box C. This carrier R works in a groove cut in the hub of worm wheel P, so as to hold the said worm wheel P in gear with worm O. The worm wheel P slides on the shaft Q, that is; when the grind stone A' is moved to or from the center of machine, by the screws G and G'.

S S are two eccentrics, keyed on the ends of shaft Q (one of these eccentrics is plainly shown on Fig. 4).

S³ and S⁴ represent two movable boxes or carriers, the lower part of said carriers S³ S⁴ are drilled and tapped, to receive the screws U and U'. A slot is cut in each of the boxes or carriers S³ and S⁴ (see Fig. 4) into which one of the eccentrics S S revolve, (one on each end of machine).

T T are two carriers fixed to movable frame E, into which the shaft Q revolve.

When the machine is in operation, the boxes or carriers S³ and S⁴ are held sta-

tionary by screws U and U', and by the eccentric S S receiving a rotary motion from the before described worm O and worm wheel P. A traversing motion is given to the frame E grind stones A and A' and all other parts that are fixed to said frame E. for the purpose of bringing every part of the periphery of grind stones A and A' in equal contact with the article being ground or polished, thereby preserving a true cylindrical surface, on the face of both stones.

W' represents a miter wheel keyed on the end of screw U.

W² represents a miter wheel keyed on the end of screw U' (the shaft of said screw U' extends across the machine, (see Fig. 1) so that the workman can turn the said screw U' and all connected thereto from either side of machine.)

W³ and W⁴ are two miter wheels keyed on shaft Y.

X' X² are two carriers firmly fixed to main frame Z to carry the shaft Y.

The handles or winches a² and a³ are fixed on the ends of screw shaft U'.

The screws U and U' are placed in carriers U³ and U⁴ said carriers are bolted to main frame Z. The screws U and U' work in the lower part of eccentric carriers, or boxes: S³ and S⁴. The screw U being screwed into the box S³ and screw W' being screwed into the box S⁴, receive equal motion by the said screws being geared together by the miter wheels W' W² W³ and W⁴.

It will now be perceived, by giving a rotary motion to screws U and U' the eccentric carriers or boxes S³ and S⁴, are moved nearer to, or farther from the front of machine, and in consequence of the eccentrics S, S being placed in the slot of said carriers, or boxes S³ and S⁴ as before explained: the frame E, and all connected thereto, are moved from one side of machine to the other.

The stones A and A' are thereby placed opposite either of the saw frames when required.

V represents a double sided perpendicular slide securely fixed in the center of machine, V' and V² are two slides also secured to machine. The upper ends of slides V V' and V² are secured to the top of frame D⁵, the lower ends of said slides are bolted to the cross beam of main frame Z (Fig. 2). Cross bars E' E' also assist in holding said slides in a correct position. The slide V, in the center of machine, having a A planed on each side, serves as a guide to both saw frames.

F' and F² represent two saw frames, planed so as to slide freely between the slides V V' V².

G² and G³ represent the saws, fixed in frames F' F² by screws nuts and pins, in a perpendicular position with the surface parallel with the axis of grind stones A and

A', said saws, it will be seen, are thus placed between the two stones A and A' so as to receive simultaneously the action of both stones A and A', one at each side of said saw. The saw frames F' and F² and saws G² G³ are worked up and down, by the connecting rods H' and H², said connecting rods H' and H² being connected to the upper levers or beams I', saw frames F' F² and fly wheels K' and K² respectively. Each saw frame (Fig. 2) is separate and detached from the other.

M' is a shaft held by carriers M² and M³. N' is a shaft similar to shaft M' carried by carriers M⁴ and M⁵. The fly wheel K' is keyed on shaft M' the fly wheel K² is keyed on shaft N'. The pulley L' is also keyed on shaft M' the pulley L³ is keyed on shaft N' the pulley L² is loose on the end of shaft M'. A slot is cut in the fly wheels K' and K² for the purpose of moving the crank pins K³ nearer to or farther from the center of said fly wheels K' or K², to give a longer or shorter stroke to saw frames F' and F² according to the length of the article to be ground or polished.

P¹ represents the belt that communicates a rotary motion from pulley Q' on main shaft R' to the pulleys L' L² or L³ as the case may be.

S⁵ and S⁶ are two balance weights. One of these weights is secured to each of the levers or beams I', to counterbalance the weight of saw and frame.

From the above description it will be perceived, that either of the saw frames may be put in motion, by simply putting the belt P' on to either of the fast pulleys L' or L³ as required.

T' and T² are two pulleys keyed on driving shaft R'. These pulleys are required to be considerably broader, than those now in common use, to admit of the stones A and A' being worked on either side of machine, (that is opposite either saw frame). When the frame E is crossing from one side of machine to the other: the belts, V³ and V⁴ change their position on the pulleys T' and T².

W⁵ and W⁶ are two pulleys carried in swinging frames X these pulleys keep their respective belts tight, to counteract the movement of stones A and A', for it will be seen that, as the stones A and A' are forced nearer to or taken farther from the center of machine the belts V³ and V⁴ become tighter or slacker hence the necessity for having the tightening pulleys as shown.

The grind stones A and A' or their equivalents used in this improved grinding machine are intended, to be worked at the same speed as those now in use. They revolve in the direction indicated by arrows so that the "bite" or action that one stone may have on the surface of the article, on

one side, is perfectly counteracted by the "bite" or action of the other stone, on the other surface of said article, so in point of fact, the saw or other article, being ground or polished, has no tendency to be drawn in, or forced out, by either stone.

Water may be applied, and suitable boxes fixed under the stones to receive the refuse as usual.

10 It will be perceived by the foregoing description, that the machine is essentially a double one, in every respect,—both sides of a saw are ground or polished at the same time,—and while one saw is being ground or polished as described, the operator can place one in the second frame to be ground or polished. It is not absolutely necessary to have two saw frames as shown. I prefer having two, as described for sake of economy of time. By moving the stones across the frame E, the operator can stand close to his work while removing and replacing a saw the stones in such case need not be stopped, when an article is finished.

25 This, my improved grinding machine may be truly called a labor saving machine. Saws and other articles ground on the old system require the physical powers of man to be used to their utmost limit. In fact, all the pressure required, with few exceptions is put on by manual force. Few men except practical grinders are aware of the vast amount of labor and suffering endured by grinders of the present day. The average term of life, of practical grinders is found to be under thirty five (35) years. The work when done on this machine will be of better quality than it is possible for man to make, independent of machinery. It is calculated that by the attendance of one man, this machine will do as much work as eight (8) men perform on the old system.

45 Having now described the nature of my invention and the manner in which the same may be performed it is to be understood, that I do not limit myself to the particular arrangement of machinery as described for the grinding or polishing long mill saws, as I am quite aware that different forms and arrangements will be found necessary for effecting the same objects in machines for grinding or polishing articles of various descriptions and to which these improvements may be applied, but they will be such as any experienced workman may at once understand from the description here given, and will be governed by the nature of the work required as for instance, where short articles are required to be ground or polished, the frames (that carry the saws) are dispensed with. Trowels, knives, of various description, square blades, hand and other saws and numberless other

things may be held by pincers or tongs, similar to those used by white smiths, and placed between two stones, to be ground or polished. Various kinds of "laps" emery glazers, buffers and other similar articles can be arranged on this principle. Circular saws and other similar articles are to be fixed on a revolving mandrel by washers nut and screw, when ground or polished on both sides simultaneously by this improved machine. In such case the mandrel would serve the same purpose for the circular saw, that the reciprocating frame or saw carriage would for the long saw as herein shown and be in that respect its equivalent.

I claim—

1. The combination of two grind stones or their equivalents, revolving in the direction herein made known, for the purpose of grinding or polishing two sides of a saw or other article, simultaneously, with a reciprocating frame, or its equivalent, for the purpose of holding the article being ground or polished, whereby the tendency of either stone, to move the article, is counteracted by the action of the other stone and the same force is thereby required to reciprocate the article in either direction as described.

2. The combination of the right and left hand screws, carriers and nuts for said screws, movable pedestals or boxes, together with the cross shaft, worms, worm wheels and handles substantially as set forth, for the purpose of moving two grind stones, or their equivalents simultaneously, against opposite sides of an article being ground or polished as described.

3. I do not claim giving an automatic traverse motion to grind stones, but what I do claim is the arrangement of screws, miter wheels handles, eccentrics eccentric boxes and movable frame, substantially as herein described, whereby I am enabled at any time to move the grind stones or their equivalents, entirely across the machine for the purposes set forth, without interfering with automatic traversing motion which is given to the said stones, irrespective of their precise position with reference to either saw frame or either saw, or other articles fixed in said frames.

4. The arrangement in the same machine, of two sets of reciprocating frames either of which can be stopped without effecting the other, and a carriage, whereby the grind stones can be caused to move from one frame to the other by which arrangement one saw can be ground or polished while another is being adjusted into place.

WILLIAM SOUTHWELL. [L. S.]

Witnesses:

JAMES ECCLES,
EDWARD EVANS.