(No Model.) 5 Sheets—Sheet 1.

M. A. BENNETT & V. V. HAIDACHER.

WOOD TURNING MACHINE.

No. 483,760. Patented Oct. 4, 1892.

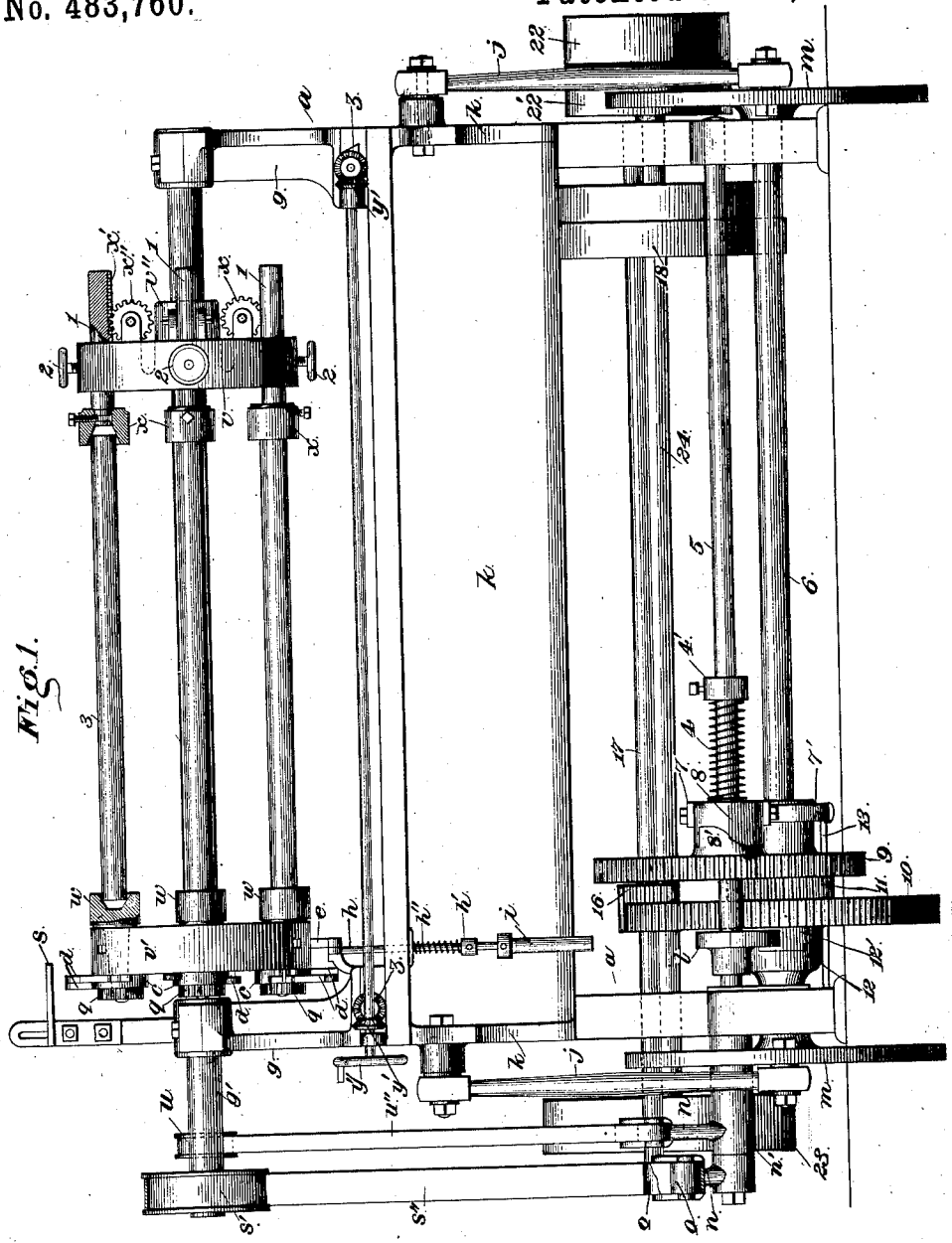

Fig. 1.

Witnesses

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(No Model.) 5 Sheets—Sheet 2.

M. A. BENNETT & V. V. HAIDACHER.

WOOD TURNING MACHINE.

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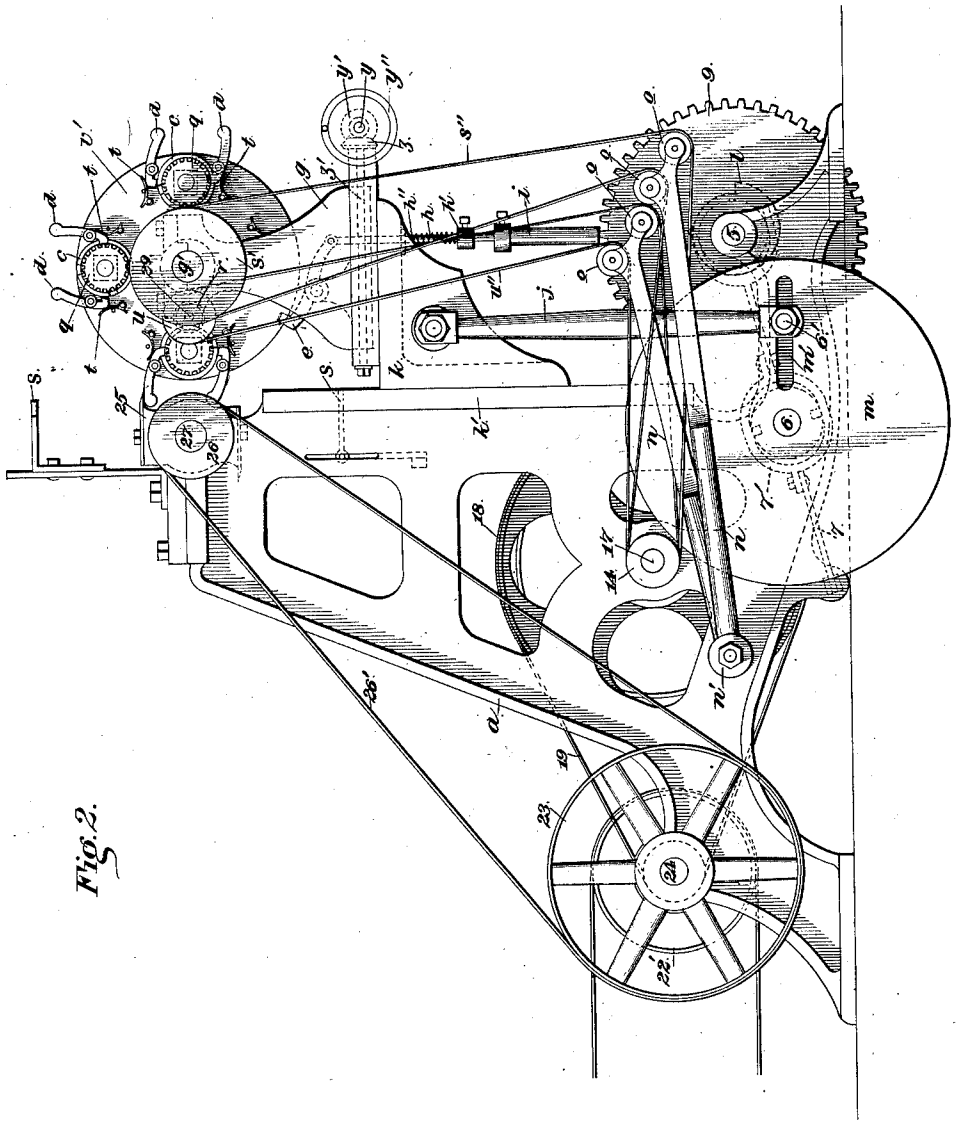

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

M. A. BENNETT & V. V. HAIDACHER.

WOOD TURNING MACHINE.

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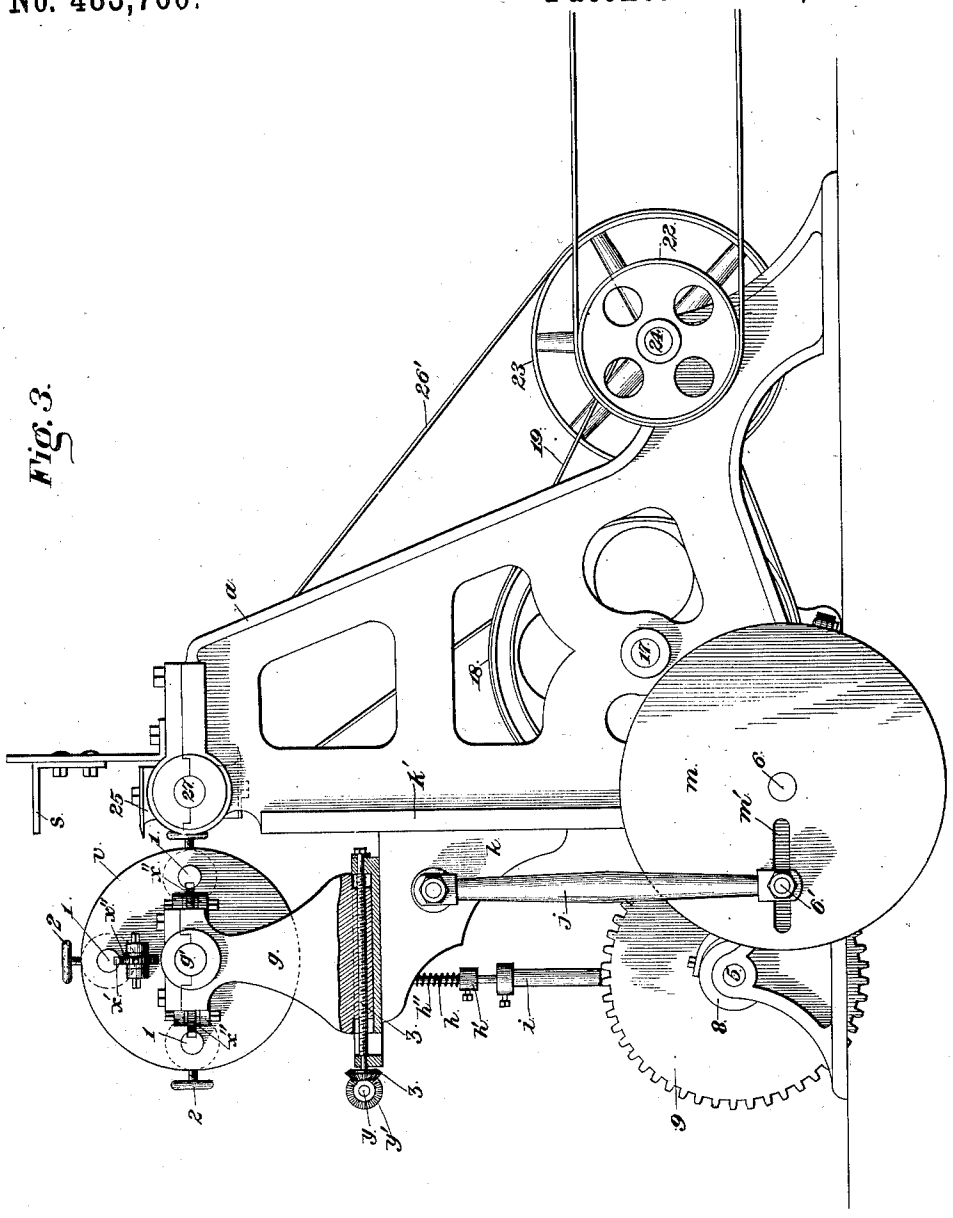
Fig. 3.



Witnesses

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M. A. BENNETT & V. V. HAIDACHER.

WOOD TURNING MACHINE.

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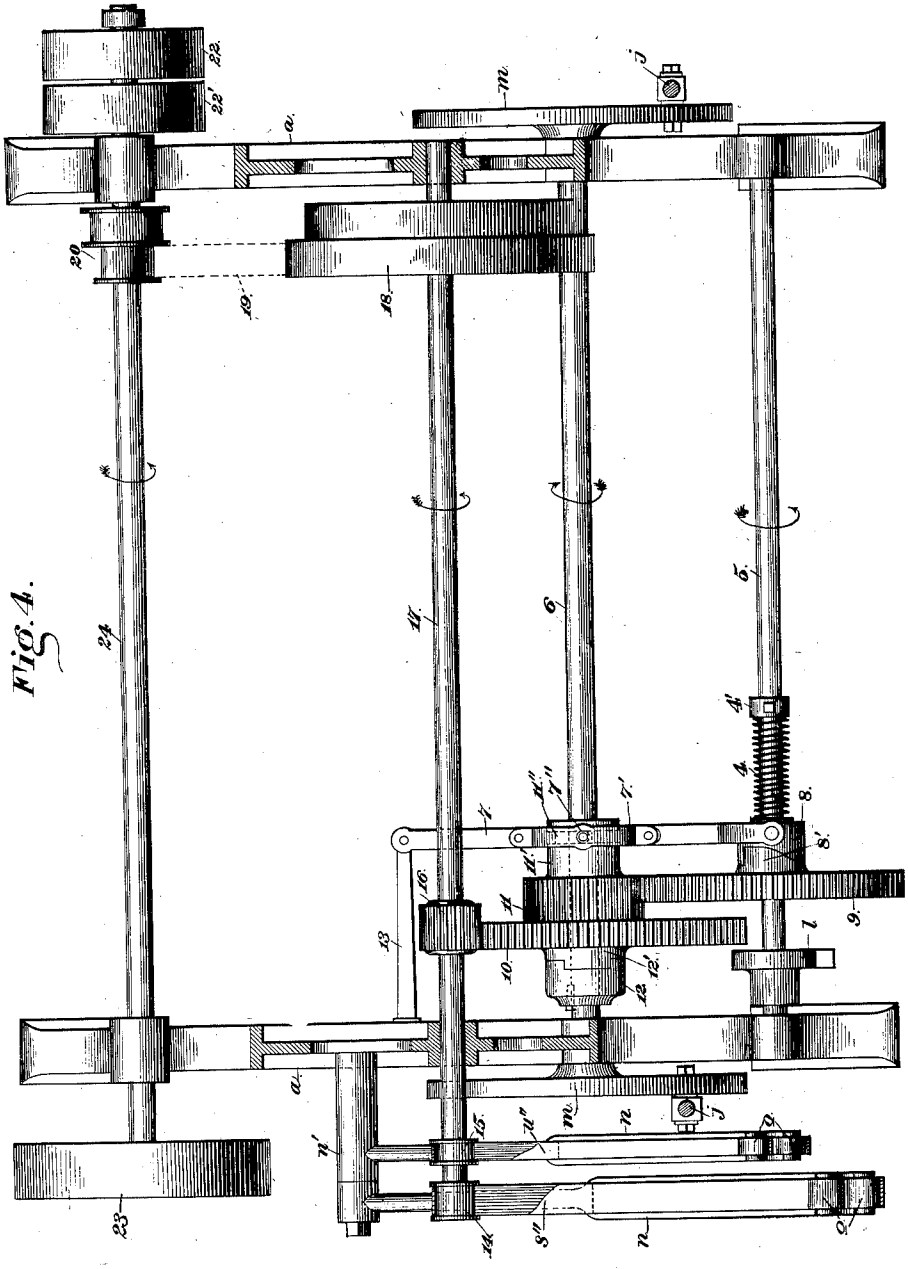
Fig. 4.



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M. A. BENNETT & V. V. HAIDACHER.

WOOD TURNING MACHINE.

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Fig. 5.

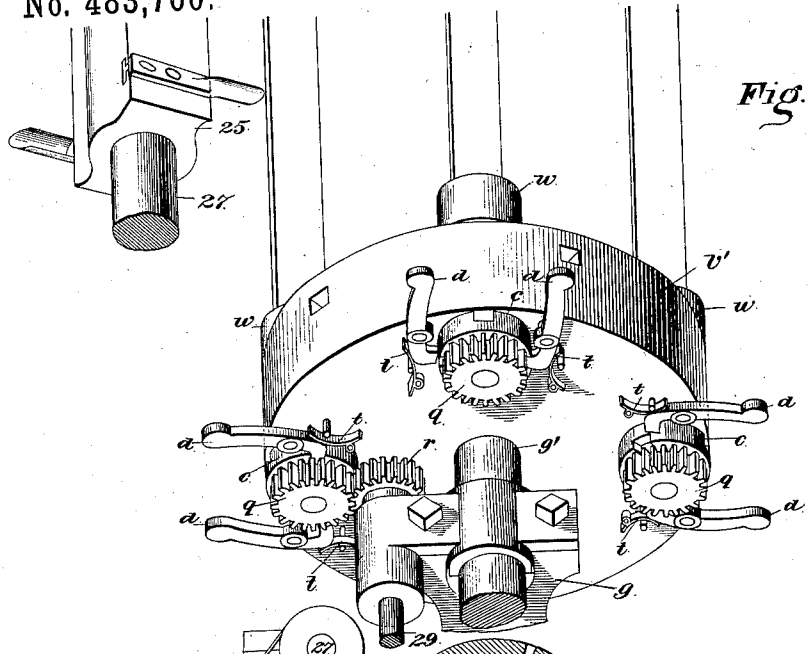


Fig. 6.

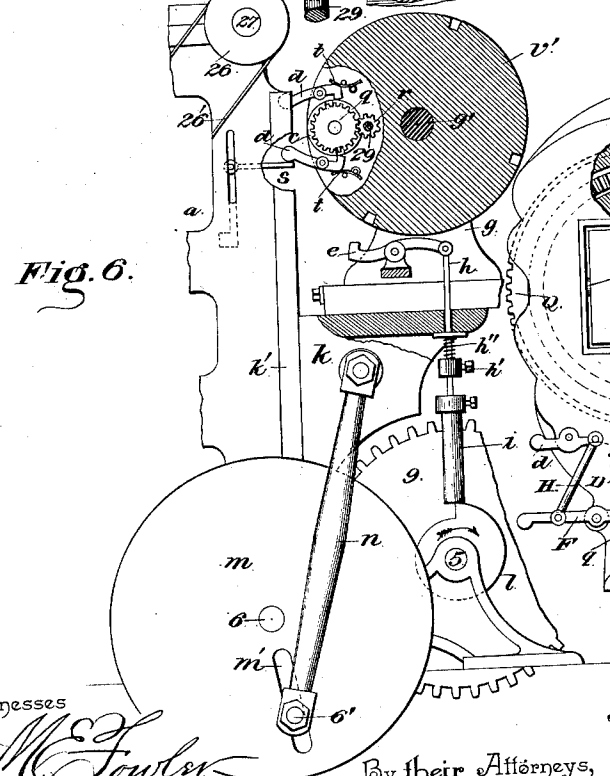
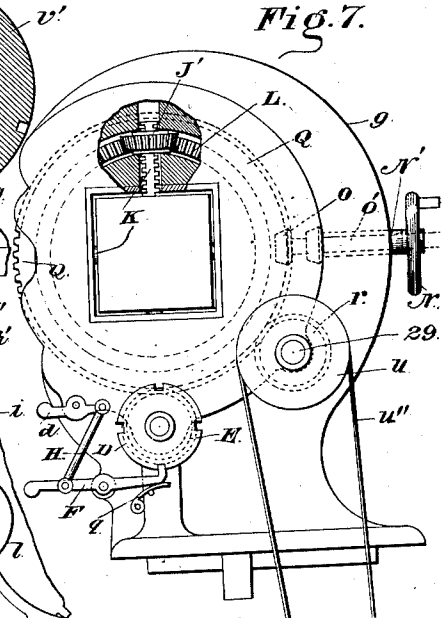


Fig. 7.



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UNITED STATES PATENT OFFICE.

MONROE A. BENNETT AND VITUS V. HAIDACHER, OF WILKES-BARRÉ, PENNSYLVANIA.

WOOD-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,760, dated October 4, 1892.

Application filed September 30, 1891. Serial No. 407,286. (No model.)

To all whom it may concern:

Be it known that we, MONROE A. BENNETT and VITUS V. HAIDACHER, citizens of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Wood-Turning Machine, of which the following is a specification.

This invention relates to wood-turning machines of that class more especially adapted for turning polygonal forms; and the object of the same is to provide means for inserting one block while another is being turned, for automatically presenting a second block to the cutters when the first has been finished, for adapting the machine to turn out work having any desired number of faces, or round, if preferred, and for adapting the machine to treat very large stock when desired.

To this end the invention consists in a machine substantially of the general and specific construction hereinafter more fully described and claimed, and as illustrated on the five sheets of drawings, wherein—

Figure 1 is a front elevation of this improved machine. Fig. 2 is a left-hand end elevation. Fig. 3 is a right-hand end elevation. Fig. 4 is a horizontal section showing the shafting, pulleys, &c. Fig. 5 is a perspective detail showing the drum, cutters, &c. Fig. 6 is an elevation of a portion of the machine shown in Fig. 3, showing the operation of certain parts. Fig. 7 is an elevation showing a modified form of drum for use for very large work.

Referring to the said drawings, the letter *a* designates the frame of this machine, which is of a suitable construction to afford supports for the various parts and bearings for the several shafts, as will be understood.

24 is the power-shaft, carrying on one end fast and loose pulleys 22 and 22′, by which this shaft is driven by belting from a suitable source, and this shaft carries a cone-pulley 20 and a large driving-pulley 23.

17 is the driving-shaft, having a large cone-pulley 18, connected by a belt 19 with the cone-pulley 20, by means of which this shaft is driven, and the shaft also has driving-pulleys 14 and 15 and a broad small driving-gear 16.

6 is a crank-shaft, having on each end a disk *m*, provided with a radial slot *m′*, in which is adjustably bolted a crank-pin 6′, the two crank-pins being in alignment, and on this shaft is keyed a clutch member 12. To the other clutch member 12′, which turns loosely on the shaft, is secured a large idle-gear 10, having a broad-geared hub 11 of smaller diameter, at one end of which is a collar 11′, having a groove 11″.

5 is a cam-shaft, which carries the rotating cam *l*, and secured to this shaft is the narrow driving-gear 9, which turns in the same direction as the driving-gear 16 through the instrumentality of the idle-gear 10 and its hub 11, which latter is in constant mesh with the driving-gear 9. To the hub of the latter gear is secured a beveled cam 8′ which, as the cam-shaft rotates pushes a sleeve 8 inwardly on the shaft against the tension of a spring 4, whose other end abuts against a collar 4′, secured to the shaft.

13 is a projection from the frame *a*, and pivoted to this projection is a lever 7, having an eye 7′ in its body, its other end being pivoted to the sleeve 8, and in the eye are rollers 7″, which take into the groove 11″ in the collar 11′.

By the mechanism so far described (and which is best seen in Fig. 4) the rotation of the power-shaft moves the driving-shaft more slowly, and the latter through the idle-gear and its hub and the driven gear moves the cam-shaft very slowly, and whenever the sleeve 8 by its shape enters the beveled cam 8′, as shown, the lever 7 moves the idle-gear so that the clutch members 12 and 12′ engage, whereby the crank-shaft 6 is given a partial rotation. The functions performed by the several movements are described below.

27 is the cutter-shaft, carrying the cutter-heads 25, and on one end of this shaft is the pulley 26, which is connected by a belt 26′ with the driving-pulley 23, by which means the cutters are rapidly rotated in the proper direction during all the time that the machine is in operation.

On suitable vertical dovetailed guides *k′* is mounted a bracket *k*, which extends across the front of the machine, and connecting-rods *j* pivotally connect this bracket with the

crank-pins 6′ in the disks *m*. On the bracket near its ends are mounted standards *g*, which are adapted to be moved forward and backward on the bracket by screws *z′*, having beveled gears *z* on their front ends, and beveled gears *y′* are located on a transverse shaft *y*, journaled in the two standards *g*, and mesh with the gears *z*, so that when this shaft is turned by a crank-wheel *y″* the standards will be adjusted horizontally on the bracket with relation to the cutters, as is customary in machines of this class.

This machine has no centers such as are usually employed on lathes; but in the place thereof a drum-shaft *g′* is journaled in bearings at the upper ends of the standards *g*, and this shaft has a pulley *s′* at one end, which is connected by a belt *s″* with the driving-pulley 14 on the driving-shaft 17.

n′ is a projection from the frame *a*, as seen in Figs. 2 and 4, and pivoted to this projection are weighted belt-tighteners *n*, each of which extends forwardly and has a pair of rollers *o* in its free end. The belt *s″* turns an angle and is of considerable length, and between the pulleys which it connects it passes over the rollers *o* in one of these belt-tighteners, and by this means the drum-shaft *g′* will be constantly rotated (unless checked, as described below) whether it be raised or lowered upon its supporting-brackets *k* and in whatever position it is adjusted by the crank-wheel *y*.

v v′ are drums mounted on and rotating with the drum-shaft *g′*, the drum *v* preferably having a hub *v″*, adjustable longitudinally on the shaft by a set-screw or otherwise to accommodate the machine to blocks of different lengths. In this drum are located concentrically around the shaft *g′* a number of centers or chucks *x*, whose shanks 1 pass outwardly through the drum and are adjustable longitudinally therein by set-screws 2.

w are corresponding centers or chucks, whose shanks are journaled in the other drum *v′*, and on the shank of each chuck just outside this drum is removably placed a notched disk *c*, its notches regulating the number of sides or faces which the finished work shall have, while outside this disk on the shank is a gear *q*.

29 is a shaft journaled through the adjacent standard and having a gear *r* on its inner end, adapted to mesh with whichever gear *q* is opposite, while the outer end of the shaft carries a pulley *u*, connected by a belt *u″* with the driving-pulley 15, this belt passing over the rollers *o* on the other belt-tightener *n*, as and for the purpose above set forth.

The drum *v′* is provided in its outer face with notches corresponding with the number of chucks *w* which it carries, and *e* is a latch centrally pivoted in the standard *g* and having one end turned in and adapted to engage one of these notches, so as to hold a block 3 between the two chucks exactly opposite the rapidly-revolving cutters 25. From the other end of the latch depends a rod *h*, on which is an adjustable collar *h′*, borne down by an expansive spring *h″*, as seen in Figs. 2 and 6, so that the latch is thrown normally into engagement with one of the notches of the drum. On the lower end of the rod is mounted an adjustable sleeve *i*, whose lower extremity is struck at predetermined periods by the rotating cam *l*, as hereinafter described, to trip the latch and allow the belt *s″* to turn the drum and present the next block to the cutter, the belt *s″* at other times slipping on the pulley *s′*. On the outer end of the drum *v′* are pivoted latches *d*, arranged in pairs in different planes and thrown in at their inner ends by springs *t*. The notches in the disk *c* are arranged alternately near the opposite faces of each disk and when the inner end of one latch engages a notch the other latch stands midway between two notches in its plane.

s s are stops adjustably carried by the frame above and below the normal position of the drum and in alignment with the outer ends of the latches, and hence when the drum is either raised or lowered by the bracket *k* one of these stops trips a latch *d* for an instant and allows the gear *r* to turn the chuck *w* and the block 3 to the next notch in the disk, the belt *u″* at other times slipping on the pulley *u*.

With the above construction of parts the operation of this machine is as follows: A number of blocks (in the present case four) is locked between the chucks *w* and *x* in the two drums in a manner which will be clear from the above description, knives of the proper shape applied to the cutters 25, disks *c*, having the desired number of notches applied to the shanks of the chuck *w*, and the machine started. The cutters are at all times rapidly rotated by the belt 26′, and the belts *s″* and *u″* are at all times driven, although their belt-tighteners allow them to slip over the pulleys *u* and *s′* whenever the latter are prevented by their latches from turning. The bracket *k* is slowly raised and lowered, so as to carry the stock across the face of the cutters, and whenever the drum reaches the top or bottom limit of its movement a stop *s* strikes one of the latches *d*, as above stated. This throws the inner end of that latch out of engagement with the notched disk and allows the belt *u″* to turn the disk until the next notch is engaged by the other latch. Obviously if the disk has four notches it will be turned a quarter-revolution at this time. If it have a greater number of notches, it will be turned a less distance, or if it be unprovided with notches and the latches omitted the stock will be at all times rotated and its surface will be round. Hence the machine is adapted to turn out polygonal work having any desired number of faces or work that is round. At considerable intervals the slowly-moving cam-shaft brings its rotating cam *l* against the lower extremity of the sleeve *i*, the carriage being then down, and at the same moment the beveled cam 8′ disengages the clutch members 12 12′, so that the crank-shaft 6 stands

idle for a half-revolution. While the carriage is thus allowed to stand still the cam *l* trips the latch *e* and permits the belt *s''* to turn the drum *v'* and with it the shaft *g'* and drum *v*, and by this means the next block is brought around into position to be operated on by the cutters. The cams on the cam-shaft 5 having passed on, the machine continues its work on the next block.

To adapt this machine for the treatment of very large stock, we substitute for the drum-shaft and drums above described an ordinary center (not shown) and the device best seen in Fig. 7. In this case a ring-shaped chuck turns within the standard *g*, and this chuck has a gear-ring Q' in constant mesh with the gear *r*, on whose shaft 29 is a pulley *u*, adapted to be rotated by the belt *u''*, above described. Under such circumstances the work turned out by the machine will be round, and when it is desired to have it polygonal the following devices are used: E is another gear in constant mesh with the gear-ring Q', and on whose shaft is a notched disk D. F *d* are pivoted latches connected by an oblique rod H and adapted to be struck by stops *s* on the frame, and the tip of one of these latches is forced into the notch or notches of the disk D by a spring *q*. In Fig. 7 when the disk makes one revolution the chuck will make one-fourth of a revolution and the stock will be correspondingly turned; but when it is desired to have more faces to the work turned out a disk may be substituted which has a greater number of notches, or a pulley *u* of larger dimensions may be substituted, so that the belt *u''* will turn the ring more slowly. In other respects the operation is practically the same as above described.

While we may use any form of chuck with this device, that which we prefer is shown in connection therewith and is of the following construction: Within a ring Q is a number (four shown) of flattened movable jaws K, standing radial and being threaded, as shown, and J' is a nut on each jaw, having-gear-teeth on its exterior. L is a toothed band on the ring Q, engaging this gear, and O is another gear meshing with the teeth on the opposite side of the band and mounted on a shaft O', rotating and sliding in a box N' on the standard and having a crank-wheel N at its outer end. When the block is inserted, one end is passed into the ring and centered within the jaws and the crank N is turned to rotate the ring, turn the nuts J, and slide the jaws inwardly until they embed the block and hold it in proper axial position within the ring. The shaft O' and its gear O are then drawn bodily outward, as seen in dotted lines in Fig. 7, whereby their connection with the ring is severed and the further treatment of the stock is continued, as above described. This entire device and standard and all the mechanism designated by upper-case reference-letters may be substituted for the drum *v'* and standard *g*, (shown in Fig. 1,) the belt *s''* at that time being idle, and such change can be quickly made to convert the machine into a lathe for turning large stock, as will be readily understood by those familiar with this art.

Another manner in which we can adapt this machine to the turning of large work, although not as large as the stock operated on by the machine shown in Fig. 7, is as follows: The standards *g* are drawn forward and farther from the cutters. The crank-pins 6' are moved outwardly in the slots *m'* of the disks *m*, so as to give the bracket *k* a longer vertical reciprocation. The stops *s* are adjusted vertically and farther from the cutter-shaft 27, and the sleeve *i* is adjusted vertically on the rod *h*. These various adjustments permit a block of larger diameter than those shown in dotted lines in Fig. 2 to be inserted between the several chucks *w* and *x*, for the reason that the axis of each pair of chucks is moved farther from the cutters. The increased movement of the bracket moves the then wider face of the stock for a greater distance across the cutters, as is necessary in this case, and the adjustments of the stops *s* and of the sleeve *i* are required by this change in the length of movement of the bracket *k*. Obviously to accommodate the machine to smaller stock than that shown the parts mentioned must be adjusted in the opposite directions.

In Fig. 1 we have shown the shanks 1 of the several chucks *x* as provided with gear-teeth *x'*, and *x''* are gear-wheels engaging these teeth, journaled in suitable brackets projecting from the rear side of the drum *v* and having squared shafts, as illustrated, and a crank-handle (not shown) is provided which may be fitted to any of these shafts, whereby the shanks of the chucks can be adjusted one by one, locked in adjusted position by the set-screws 2, and, finally, the crank-handle removed entirely, so as to be out of the way while the machine is running.

What is claimed as new is—

1. A rotating shaft, a drum fixed thereon and having chucks, and cutters, in combination with a second drum having a hub adjustable longitudinally on said shaft, chucks having toothed shanks passing outwardly through this drum at points to support the chucks in alignment with those in the other drum, set-screws through the movable drum, bearing on said shanks, and gear-wheels journaled in brackets at the rear side of the drum adjacent each shank and engaging the teeth thereof, the shaft of said wheel being squared, as and for the purpose set forth.

2. A vertically-moving standard, a chuck journaled for rotation and carried thereby, and a notched disk connected with said chuck, in combination with a spring-actuated latch normally engaging a notch in said disk and stops by which the engaging latch is tripped as the standard moves, substantially in the manner set forth.

3. A vertically-moving standard, a chuck

journaled for rotation and carried thereby, and a notched disk connected with said chuck, in combination with a spring-actuated latch which normally engages a notch in said disk, stops by which the engaging latch is tripped as the standard moves, and means for automatically turning the chuck in its bearings when said latch is tripped, substantially in the manner set forth.

4. A vertically-moving standard, a chuck journaled for rotation and carried thereby, and a notched disk connected with said chuck, in combination with a spring-actuated latch which normally engages a notch in said disk, stops by which the engaging latch is tripped as the standard moves, a pulley journaled in the standard and connected by gearing with said chuck, a belt leading from said pulley, bent at an angle, and passing around a driving-pulley, and a belt-tightener in said angle, substantially as described.

5. A vertically-moving standard, a chuck journaled for rotation and carried thereby, latches preventing such rotation, and means for tripping the latches at certain times, in combination with a pulley connected with said chuck, a belt leading downwardly from said pulley, bent at an angle, and extending laterally to and around a driving-pulley, and a weighted belt-tightener mounted at one end on a pivot and having rollers at its other end resting in the angles of said belt, substantially as described.

6. A rotating disk having a radial slot, a crank-pin adjustable therein, a vertically-movable bracket, a rod pivotally connecting said bracket and pin, and a standard adjustable laterally on the bracket, in combination with a chuck journaled for rotation and carried by the standard, a pulley connected with said chuck, a belt leading from said pulley, bent at an angle, and passing around a driving-pulley, and a belt-tightener in said angle, substantially as described.

7. A vertically-moving bracket, means for adjusting the length of the movement thereof, and a standard adjustable laterally on the bracket, in combination with a chuck journaled for rotation in said standard, a pulley connected with said chuck, a belt leading from said pulley, bent at an angle, and passing around a driving-pulley, and a belt-tightener in said angle, substantially as described.

8. A vertically-moving bracket, means for adjusting the length of the movement thereof, a standard adjustable laterally on said bracket, a chuck journaled for rotation therein, and means for producing such rotation, in combination with spring-actuated latches normally preventing said rotation and vertically-adjustable stops tripping a latch at each end of the movement of the bracket, substantially as described.

9. A vertically-moving standard, a chuck carried thereby and adapted for rotation, and a disk detachably connected to the shank of said chuck and having alternating notches in its periphery, in combination with latches pivoted above and below said disk and having inturned ends adapted to alternately engage said notches, springs bearing said ends into operative position, and stops adapted to trip said latches at the ends of the movements of said standard, as and for the purpose set forth.

10. In a wood-turning machine, a moving standard carrying chucks, a latch for each chuck, and devices for tripping the latch of any one of the chucks as the standard reaches the limit of its movement, substantially as specified.

11. In a wood working-machine, a moving standard carrying brackets, chucks mounted on the brackets, a latch for each chuck, the rotary cutters, devices for adjusting the brackets laterally toward or away from the cutters, means for moving the standard carrying the chucks across the path of the cutters, said means being capable of adjustment to regulate the length of the stroke, and adjustable stops or tripping devices against which the latch of any one of the chucks is adapted to abut to trip the same, for the purpose set forth.

12. A vertically-moving standard, a drum journaled therein and having notches, a latch, a spring bearing the latch normally into engagement with one of the notches, and a rotating cam tripping said latch at predetermined intervals, in combination with a number of chucks journaled in said drum, a rotating cutter, means for rotating the chuck adjacent the cutter, a spring-actuated latch normally preventing the rotation of said chuck, and stops for tripping said latch at the extremities of the movements of said standard, substantially as described.

13. In a wood working-machine, a moving standard carrying a drum provided with chucks, a latch for each chuck, devices for tripping the latch of any one of the chucks at the end of the limit of movement of the standard, means for rotating the drum, a latch to hold the drum inactive, and devices actuated by the operative gearing to trip the latch and release the drum, whereby the latter is permitted to be turned by the means for rotating the same, substantially as described.

14. A standard, a drum journaled therein and having notches in its periphery, a pulley on the shaft of said drum, a belt connecting said pulley with a driving-pulley, a latch normally preventing the rotation of the drum, and means for tripping said latch at predetermined intervals, in combination with a number of chucks journaled in said drum, a cutter, means for rotating the chuck adjacent the cutter, a latch normally preventing the rotation of this chuck, and means for tripping this latch at shorter intervals than those at which the drum-latch is tripped, as and for the purpose set forth.

15. A vertically-moving standard, a drum journaled therein, and means for giving the

drum a partial rotation at predetermined intervals, in combination with a number of chucks journaled in the drum and having gears on their shanks, a shaft journaled in the standard and having a gear engaging that on the shank of the chuck at the rear of the drum, a pulley on said shaft, means for rotating said pulley, a latch normally preventing the rotation of said chuck, a stop for tripping said latch, and a rotating cutter at the rear of the drum, substantially as described.

16. A vertically-moving bracket, means for adjusting the length of the movements thereof, a standard on said bracket, and a drum journaled in the standard and having notches in its periphery, in combination with a latch centrally pivoted to the standard with one end in the path of said notches, a rod pivoted to and depending from its other end, an adjustable sleeve extending beyond the lower end of said rod, and a rotating cam adapted to strike said sleeve, substantially as described.

17. A vertically-moving bracket, means for adjusting the length of the movements thereof, a standard on said bracket, a drum journaled in the standard and having notches in its periphery, a pulley on the shaft of said drum, a belt connecting this pulley with a driving-pulley, and a belt-tightener therefor, in combination with a latch normally engaging one of said notches, a rod depending from said latch, means for adjusting the length of the rod, and a rotating cam adapted to push said rod at predetermined intervals, as and for the purpose set forth.

18. A vertically-moving bracket, means for adjusting the length of the movements thereof, a standard on said bracket, a drum journaled in the standard and having notches in its periphery, a pulley on the shaft of said drum, a number of chucks journaled in said drum, a cutter, a shaft journaled in said standard and having a pulley, connections between said shaft and the chuck which stands adjacent said cutter, a loose belt connecting each of said pulleys with a source of power, and a belt-tightener for each belt, in combination with a latch normally engaging one of said notches, a rod depending from said latch, means for adjusting the length of the rod, and a rotating cam adapted to push said rod at predetermined intervals, as and for the purpose set forth.

19. A vertically-moving bracket, means for adjusting the length of the movements thereof, a standard on said bracket, a drum journaled in the standard and having notches in its periphery, a pulley on the shaft of said drum, a number of chucks journaled in the drum, a rotating cutter, a shaft journaled in said standard and having a pulley, connections between said shaft and the chuck which stands adjacent said cutter, latches normally preventing the rotation of this chuck, stops tripping said latches at the limits of the movement of said bracket, a loose belt connecting each of said pulleys with a source of power, and a belt-tightener for each belt, in combination with a latch normally engaging one of said notches, a rod depending from said latch, means for adjusting the length of the rod, and a rotating cam adapted to push said rod at predetermined intervals, as and for the purpose set forth.

20. In a wood-turning machine, the driving-shaft having a broad driving-gear, a crank-shaft having a clutch member fixed thereon, a vertically-movable standard connected with the crank of said shaft, a notched disk journaled in said standard and carrying the chuck, a latch adapted to engage one of said notches, and a rod depending therefrom, in combination with an idle-gear turning loosely on the crank-shaft and carrying a second clutch-member, said gear meshing with the driving-gear and having a broad toothed hub with an integral grooved collar, a cam-shaft having a rotating cam engaging the lower end of said rod, a driven gear on this shaft meshing with said toothed hub and having a beveled cam, a spring-actuated sleeve engaged by said cam, and a lever pivoted at one end to this sleeve and at the other end to a fixed support and having a roller between its ends engaging said grooved collar, the whole operating substantially as described.

21. In a wood-turning machine, the driving-shaft having a broad driving-gear, a crank-shaft having a clutch member fixed thereon, a vertically-movable standard connected with the crank of said shaft, a notched disk journaled in said standard and carrying the chuck, a latch adapted to engage one of its notches, and a rod depending from the latch, in combination with an idle-gear turning loosely on the crank-shaft and carrying a second clutch member, said gear meshing with the driving-gear and having a broad toothed hub, a cam-shaft having a rotating cam engaging the lower end of said rod, a driven gear on this shaft meshing with said toothed hub, and means, substantially as described, for moving said hub longitudinally on the crank-shaft at predetermined intervals, the whole operating as set forth.

22. In a wood-turning machine, the driving-shaft having a broad driving-gear, a crank-shaft having a clutch member fixed thereon, a vertically-movable standard connected with the crank of said shaft, a notched disk journaled in said standard and carrying the chuck, and a latch adapted to engage one of its notches, in combination with an idle-gear turning loosely on the crank-shaft and carrying a second clutch member, intermittent tripping devices for said latch, the idle gear constantly connecting said driving-gear with such devices, and means, substantially as described, for moving the idle-gear and its clutch member longitudinally on the crank-shaft at predetermined intervals, as and for the purpose set forth.

23. A driving-shaft journaled in a frame and having independent driving-pulleys, a

crank-shaft connected with said driving-shaft, a vertically-movable bracket, a rod connecting this bracket with the crank of said shaft, and a laterally-movable standard on said bracket, in combination with a drum journaled in said standard and having a pulley on its shaft, a number of chucks journaled in the drum and each having a gear on its shaft, a small shaft journaled in said standard and having a gear adapted to engage that on one chuck and a pulley on its other end, a loose belt connecting this pulley with one of said driving-pulleys, another loose belt connecting the drum-pulley with the other of said driving-pulleys, a projection on the frame, two weighted belt-tightener arms pivoted on said projection, and two rollers pivoted in the outer end of each arm and engaging one of said belts, as and for the purpose hereinbefore set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

MONROE A. BENNETT.
VITUS V. HAIDACHER.

Witnesses:
E. G. SIGGERS,
E. GUNSTER, Jr.