No. 898,168. PATENTED SEPT. 8, 1908.

H. C. BAASE.

RETRACTING MECHANISM FOR AUTOMATIC CARVING MACHINES.

APPLICATION FILED NOV. 23, 1903.

2 SHEETS—SHEET 1.

Fig. 2

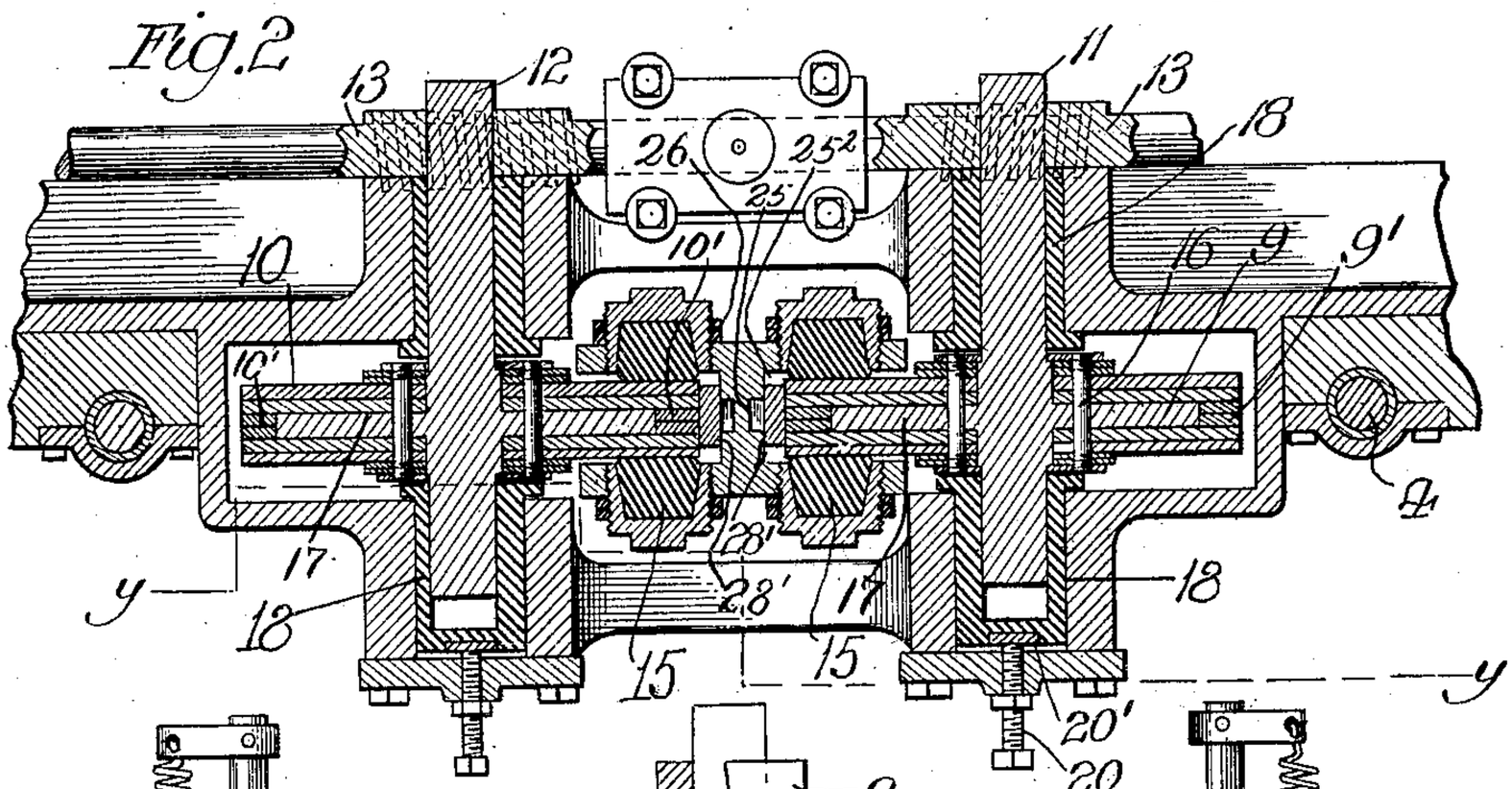
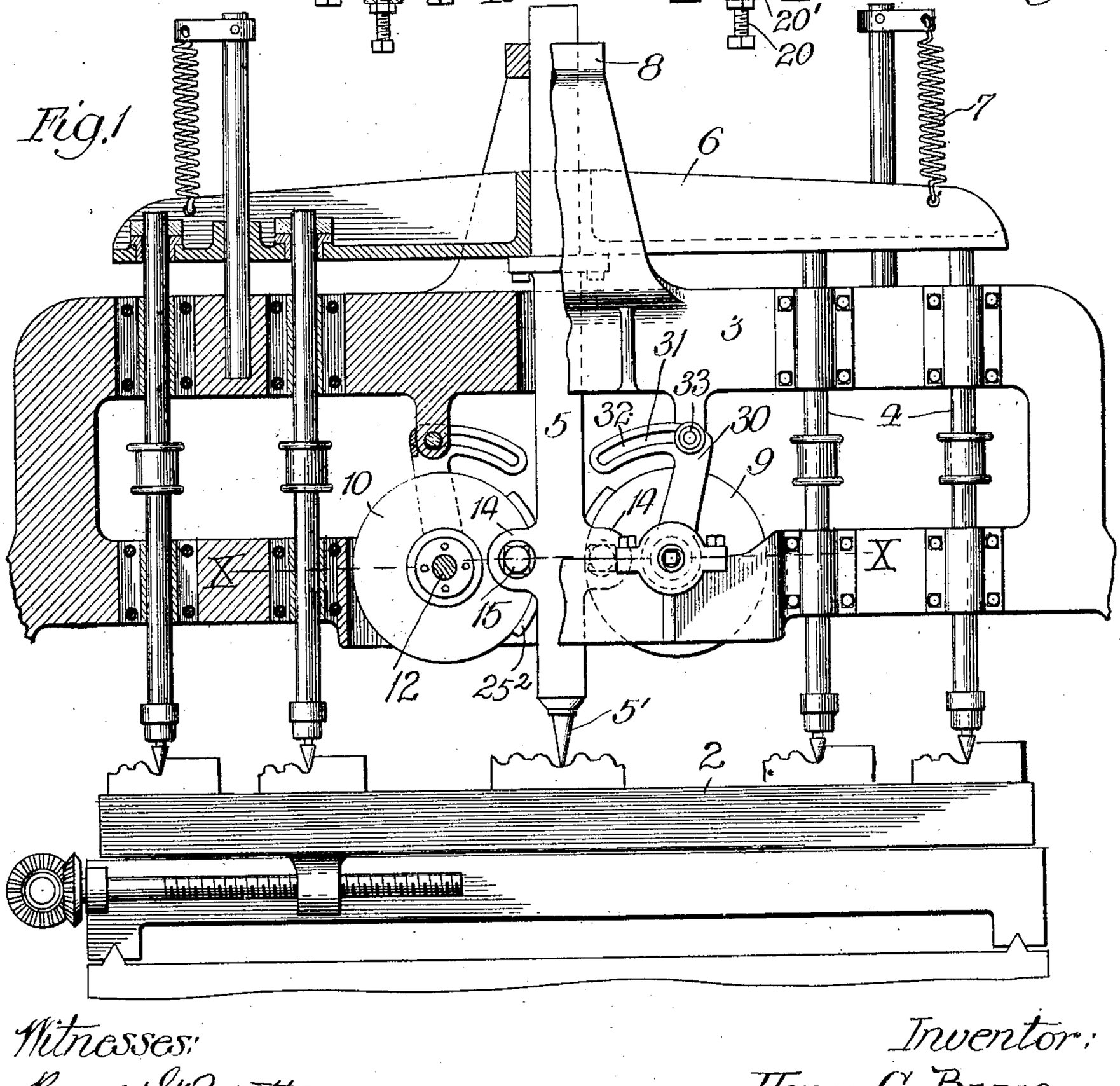


Fig. 1



Witnesses:
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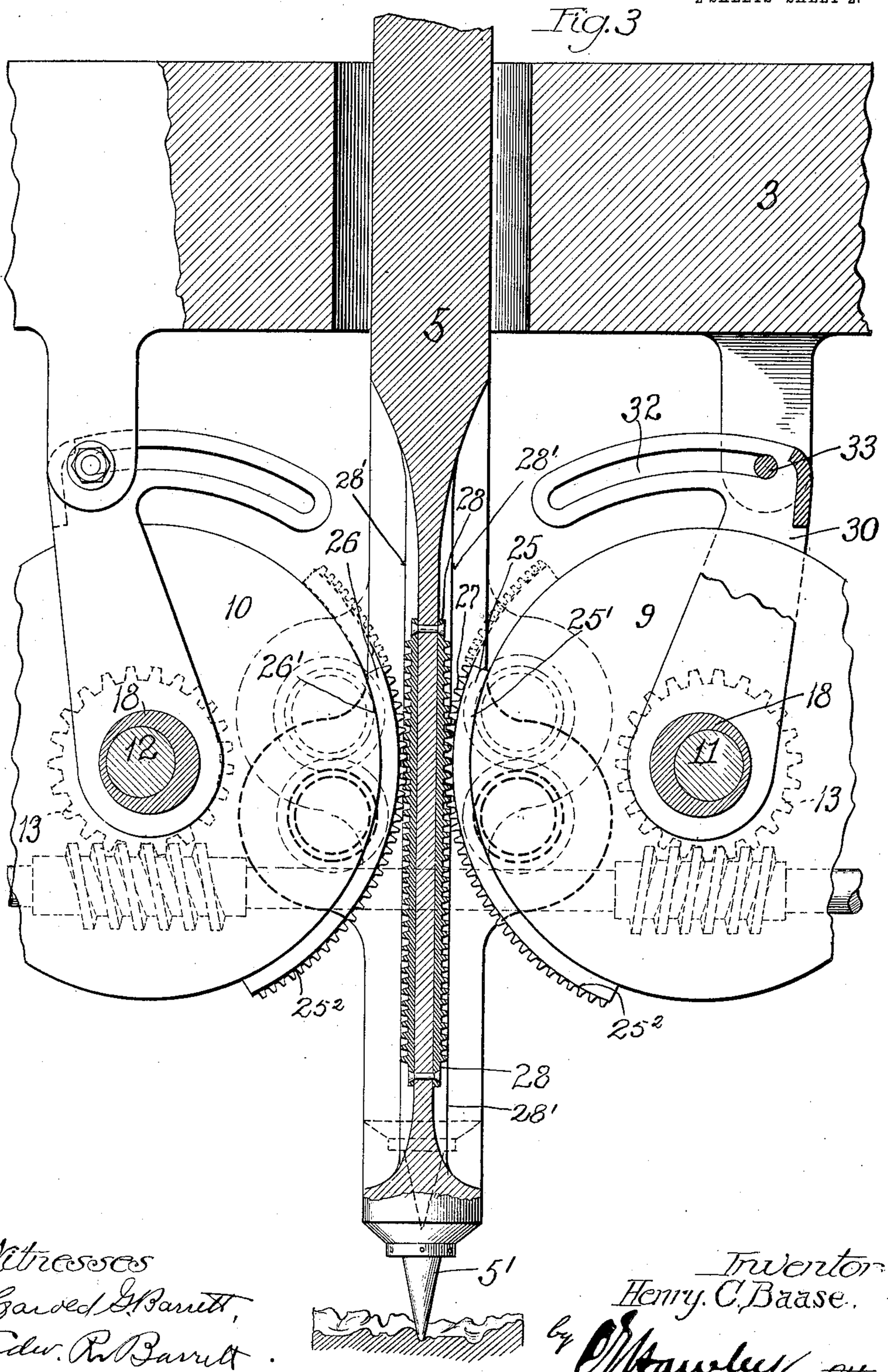
2 SHEETS—SHEET 2.

Fig. 3



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Henry C. Baase.
by O. Stanley Atty

UNITED STATES PATENT OFFICE.

HENRY C. BAASE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO UNIVERSAL AUTOMATIC CARVING MACHINE CO., OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

RETRACTING MECHANISM FOR AUTOMATIC CARVING-MACHINES.

No. 898,168. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed November 23, 1903. Serial No. 182,365.

To all whom it may concern:

Be it known that I, HENRY C. BAASE, a citizen of the United States, residing at the city of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Retracting Mechanism for Automatic Carving-Machines, of which the following is a specification.

My invention relates to automatic carving machines, and has special reference to improvements upon the automatic retracting mechanism therein employed, particularly that which is shown and described in Letters Patent No. 696,382, granted to Streich & Ruehs, March 25, 1902.

In the patented machine there is a tracer-bar which occupies a vertical position in the frame of the machine. This has a tracing-point, and, as it is raised or lowered to respond and conform to the pattern, it correspondingly operates the cutting-tools, to reproduce the pattern upon the moving pieces of work in the machine. The retracting mechanism of the patented machine comprises two friction-disks arranged upon horizontal, longitudinally-extending shafts, operative in conjunction with friction-buttons upon said tracer-bar. When the lower or tracing-end of said bar is subjected to pressure, because of a prominence thereby encountered in the longitudinally-moving pattern, the friction-buttons of one side of the bar are pressed so firmly against the rotating disks that the latter are enabled to raise or retract the tracer-bar and thereby free and assist the tracer to mount a contacting prominence in the pattern. The power and reliability of this retracting mechanism is such that it may be depended upon to retract the tracer from the path of any shoulder or prominence on the pattern which, viewed in a horizontal plane, meets the tracer on a line perpendicular to the movement of the pattern or within an angle of 45° thereto; but when the tracer is engaged by a pattern prominence or shoulder that approaches the same at an acute angle thereto, tending to engage the side rather than the front or the back of the tracing-point, the resultant longitudinal pressure of the tracer-buttons against the disks is often too slight to produce the quick retraction of the tracer. When this occurs, the machine must be stopped, or the tracer retracted quickly by hand; otherwise, the tracer-point and the cutters are endangered by the onward movement of the feed-table, which carries the pattern and work. Pressure upon the side of the tracing-point, as distinguished from pressure upon the front or back thereof, does not influence or cause the operation of the retracting mechanism. This fault in the patented machine necessitates the presence at the machine of an operator who must watch the performance thereof and manually assist the tracer upon dangerous parts of the pattern.

The object of my invention is to provide a retracting mechanism in which the good features of said patented device shall be preserved and which shall possess the added ability to respond to lateral pressure upon the tracing-point from any direction.

The particular object of the invention is to improve the patented retracting mechanism by adding thereto devices that will render the same operative under angular and side pressures. And still another object of the invention is to provide means for taking up wear in the parts of the retracting mechanism, to the end that the proper relations thereof may be maintained exactly and with ease.

My invention consists, generally, in a retracting mechanism for carving machines comprising oppositely rotating disks, in combination with a tracer-bar, and peripheral clutch parts interposed between said disks and said bar, constantly connected with said bar and operating to retract said bar when subjected to angular or side pressure. And my invention also consists in means for adjusting said disks to insure and maintain their engagement with the aforesaid clutch parts and substantially or wholly prevent lateral movement of the bar, between said disks; and further, my invention consists in various details of construction and in combination of parts all as hereinafter described and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming a part thereof, and in which:—

Figure 1, is an elevation of a carving-machine tool-head equipped with a retracting mechanism embodying my invention; parts of said head being shown in vertical section;

Fig. 2, is an enlarged horizontal section substantially on the line x—x of Fig. 1; and Fig. 3, is a still further enlarged vertical section substantially on the irregular section line y—y of Fig. 2.

In the drawings, 2 represents the feed-table of the carving machine. This is moved longitudinally by a suitable reciprocating mechanism (not shown), and it also has a transverse or side-feed movement. Above the table is the tool-head comprising the frame, 3, the cutter-spindles, 4, the tracer-bar, 5, and the cross-beam, 6. The beam connects the tracer and the cutter-spindles and the weight of all is partially sustained by springs, 7. The upper end of the tracer-bar is held by a suitable bearing, 8, preferably arranged above the cross-beam, to which arrangement, however, I make no claim in this application.

In the lower part of the head are two friction-disks, 9 and 10. These are arranged on the shafts, 11 and 12, held in the frame; and are driven in opposite directions by the right and left worms (see dotted lines Fig. 2) which engage the worm-gears, 13, 13, on said shafts. The tracer-bar terminates in the tracing-point, 5′, at its lower end, and said bar is provided on opposite sides with ears or extensions, 14, wherein the friction-buttons, 15, are placed for engagement with the opposite sides of the disks, 9 and 10. These buttons are adjustable and are usually placed in actual contact with the sides of the disks; in fact, they are so at all times except when they have been affected by wear. These are the buttons hereinbefore mentioned, and the same coöperate with the disks to elevate the tracer-bar when pressure is exerted thereon by the pattern on the moving table, 2. As before explained, however, these appliances, while operable under direct pressure from the pattern, are not operatively affected by side pressure upon the tracing-point. To adapt the retracting mechanism for effective operation under such conditions, I employ two peripheral clutch parts upon the disks, 9 and 10. These clutch parts may have either of several forms; may radiate from the disk-centers or the like, but I prefer to make them in the form of curved racks, 25 and 26, the teeth, 27, of which engage with the flat or straight racks, 28, 28, provided on the sides of the tracer-bar. Connected to the bar in this manner, it is obvious that said bar will be moved when movement is communicated to either of the peripheral clutch parts. The inner surfaces, 25′, 26′, of the clutch parts conform to the peripheries of their disks and preferably fit snugly thereon at all times. The normal or idle engagement is insufficient to cause the clutch parts to adhere to the disks, but when additional pressure is exerted to force either thereof against its disk, as when the bar is pressed sidewise, the clutch part pressed upon will bind on the disk and momentarily become an operative part of it.

It will be observed that the clutch parts are attached or connected to the tracer-bar. They are, therefore, normally held in the position shown in Fig. 3, by reason of the weight of said bar and the parts attached to it; but when side pressure is exerted upon the tracing-point, as when said point encounters an acute angled portion of the pattern, the tendency thereof will be to laterally deflect the tracer-bar, and at such instant the tracer-bar will be forced strongly against the peripheral clutch member which opposes its movement and same will be thereby pressed upon the periphery of its rotating disk, which, in proportion to the stability of the attachment thus constituted between the disk and the bar, will elevate said bar and permit the onward movement of the pattern. When a pattern prominence of slight inclination encounters the tracing-point, both longitudinal and transverse pressures will be resultantly applied to the tracer-bar, and at such a time both of the friction elements, the buttons and one of the peripheral clutch parts will be forced into service to retract the bar. Pressure on the opposite side of the tracing-point will apply the other clutch part to its disk. By these additions, any retracing mechanism of the general type referred to may be rendered reliable under all conditions of use, with all kinds and shapes of patterns.

It should be specially noted that there can be no sliding movement of the clutches upon the tracer-bar and that the frictional resistance to the movement of the bar is slight. To further reduce friction between the parts and to relieve the teeth of the racks from pressure, I provide the clutch parts with rolling surfaces, 25^2, and the bar with straight surfaces, 28′. These preferably correspond to the pitch lines of the racks and permit the heavy pressure of the bar upon the clutch parts and disks without adding to the normal forces in opposition to the disks. In place of the gear-teeth, I may substitute flexible bands, attaching same to the tops of the peripheral or rolling clutch parts and to the lower end of the tracer-bar, whereby, as a clutch part is pressed upon its disk and raised, the tracer-bar will be lifted.

The friction-disks, 9 and 10, are built-up devices; that is, there is a thin central disk within each, preferably integral with the disk-shaft. This is faced on opposite sides by one or more thicknesses of material such as a vegetable-fiber composition, which has a high coefficient of friction upon the material whereof the friction-buttons, 15, are made. The same material is used in completing the peripheral surfaces of the disks, as shown by rings, 9′ 10′, surrounding the metal cores of said disks. The parts making up the disks

are secured by a number of bolts or rivets, 16, which pass through metal plates, 17, that form and face the hubs of the disks. It is essential that the disks shall be held against longitudinal movement in their bearings, and to this end I provide the bushings, 18, with enlarged inner ends or faces, for contact with the hubs of the disks, and also provide set-screws, 20, upon the ends of the shaft-bearings or boxes, for the purpose of forcing the ends of the bushings against the sides of the disks. The bushings do not rotate with the disks, but are kept tight against the same. The end of each bushing is preferably provided with a hardened button or plate, 20′, to receive the thrust of the set-screws. The disks are in rotation constantly, and the peripheries thereof and the inner surfaces of the peripheral clutch parts wear away with considerable rapidity. It is obvious that the device would be rendered partially or wholly inoperative if this wear was permitted to continue indefinitely, and for the purpose of taking up wear between the parts and keeping the disks, the clutch members or parts and the bar always in actual contact, the preferred condition, I place the shafts, 11 and 12, eccentrically in the bushings, 18, and provide means for partially rotating the eccentric mountings thus formed, to move the disks toward one another. The bushings, 18, of each pair are each joined by an operating yoke or arm, 30, by which the pair may be simultaneously adjusted as required to maintain the alinement thereof for the contained shaft. After adjustment, the arms or yokes are secured by the locking-screws, 33, which engage curved, slotted arms, 32, on the yokes. When the screws, 33, are loosened, the arms or yokes may be moved and the disks and intervening parts closely and accurately adjusted, the proper amount of initial pressure being thereby effected between the disks and the peripheral clutch parts or members. The outward movement of the arm or yoke causes the inward movement of the disks. These devices are also relied upon to aline the tracer-bar with its top-bearing. If desired, spring devices or weighted devices may be applied to the eccentric bushings or equivalent parts for the purpose of automatically taking up the wear upon the peripheries of the disks, but such devices are less reliable than the rigid yokes, 30, which, being normally fastened to the frame of the machine, do not yield to pressure against the disks.

It is obvious that numerous modifications of my invention will readily suggest themselves to one skilled in the art, and I therefore do not confine the invention to the specific constructions herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a carving machine, a pattern pressed member, in combination with a cutter, a continuously rotated device, and another device geared to said member and rotatively joining the same to said rotated device when the pattern pressed member is subjected to pattern pressure, substantially as described.

2. In a retracting mechanism for carving machines, a rotated disk, in combination with a movable tracer bar, perpendicular to the axis of said disk, and a friction clutch part interposed between said disk and the side of said bar and movable with said disk to operate said bar when the latter is subjected to lateral pressure, substantially as described.

3. In a retracting mechanism for carving machines, a driven disk, in combination with a member to be retracted, a pattern adapted for movement in a plane perpendicular to said member and normally exerting lateral pressure thereon, and a partially revoluble clutch part in peripheral engagement with said member and coöperating with said disk to move said member, the axis of said clutch member being at right angles to the member to be retracted, substantially as described.

4. In a retracting mechanism for carving machines, a driven disk, in combination with a member to be retracted, means normally exerting lateral pressure on said member, a friction clutch part interposed between said member and the periphery of said disk and adapted for occasional partial revolution with said disk to retract said member when the normal pressure thereon is exceeded, substantially as described.

5. In a retracting mechanism for carving machines, a rotated disk, in combination with a movable tracer member or bar and a clutch part interposed between said disk and member, said clutch part engaging the periphery of said disk and the side of said bar and adapted to retract the bar when subjected to pressure, substantially as described.

6. In a carving machine, the member to be retracted and the tools coupled thereto, in combination with a movable feed-table and a retracting device comprising coöperating friction devices, one geared to the side of said member and operable by the other to lift said member, substantially as described.

7. In a retracting mechanism for carving machines, a tracer-bar, in combination with a driven disk, presenting its periphery to the side of said bar, a peripheral clutch part joined to said bar and to coöperate with said disk and retract said bar when pressed upon said disk, substantially as described.

8. In a retracting mechanism for carving machines, the combination of a rotary disk

with a friction clutch member upon the periphery of said disk, a tool actuated member tangentially arranged with relation to said friction clutch member and adapted to occasionally move said clutch member into frictional engagement with said disk, and a pattern for coöperation with said tool actuated member, substantially as described.

9. In a carving machine, a tracer bar, in combination with a pattern, work holding means, a cutter parallel with said tracer bar, a friction disk, and a curved, segmental clutch part interposed between said tracer bar and the periphery of said disk and operable by pressure from said pattern, to retract said tracer and cutter, substantially as described.

10. In a retracting mechanism for carving machines, a pair of disks and means for rotating them, in combination with clutch parts engaging oppositely moving peripheries of said disks, and a cutter-actuating bar joined to said clutch parts and operable by one or the other thereof when pressed upon, substantially as described.

11. In a retracting mechanism for carving machines, a pair of disks mounted on parallel shafts and constantly rotated in opposite directions, in combination with clutch parts engaging the oppositely moving surfaces thereof, and partially movable therewith, and a pattern controlled tracer member joined to said clutch parts and operable thereby when pressed upon, substantially as described.

12. In a retracting mechanism for carving machines, a pair of driven disks mounted upon parallel shafts, in combination with a tracer bar arranged between said disks, and friction devices interposed between said disks and said bar and in rolling contact with the latter to coöperate with said disks, substantially as described.

13. In a retracting mechanism for carving machines, a pair of oppositely rotated friction-disks, in combination with partially revoluble friction-clutch parts engaged therewith and a tracer-bar interposed between said clutch parts for operation by said disks when pressed upon, substantially as described.

14. In a retracting mechanism for carving machines, oppositely rotated friction members, in combination with a tracer bar arranged between them, and clutch members arranged between said disks and said bar and movable with the latter, said clutch members causing the longitudinal movement of said tracer bar when subjected to lateral pressure, substantially as described.

15. In a retracting mechanism for carving machines, a pair of rotated disks, in combination with curved, peripheral clutch parts fitting said disks, and a tracer-bar normally holding said clutch parts stationary, and movable thereby when subjected to pattern-pressure, substantially as described.

16. In a retracting mechanism for carving machines, a pair of oppositely rotated friction-disks, in combination with a tracer-bar having friction-members for engagement with the sides of said disks and having other friction-members attached to it and peripherally engageable with said disks, substantially as described.

17. In a retracting mechanism for carving machines, a pair of oppositely rotated friction-disks, in combination with a tracer-bar arranged between them a plurality of friction-parts attached to said bar and engageable with the sides and peripheries respectively of said disks, for operating said bar when subjected to lateral pressure in any direction, substantially as described.

18. In a retracting mechanism for carving machines, the oppositely rotated friction-disks, in combination with a tracer-bar, longitudinally movable and perpendicular to the plane of the axes of said disks, friction-parts upon said bar for engagement with opposite sides of said disks, and friction-parts upon said bar for engagement with the peripheries of said disks, said parts and said disks holding said bar against lateral movement and causing the longitudinal movement thereof when subjected to lateral pressure, substantially as described.

19. In a retracting mechanism for carving machines, a pair of rotated disks having parallel axes, in combination with a bar placed between said disks, for following the sinuosities of a pattern, and clutch parts in rolling connection with said bar and operatively connecting said disks and said bar, substantially as and for the purpose specified.

20. In a retracting mechanism for carving machines, a pair of oppositely rotated disks, in combination with a tracer-bar arranged between the peripheries of said disks, and disk-clutch parts in rolling contact with said bar, held against longitudinal movement thereon, and engaging the peripheries of said disks, for moving said bar, substantially as described.

21. A retracting mechanism for automatic carving machines, comprising oppositely rotated disks, in combination with the tracer-bar provided with relatively movable clutch parts in frictional engagement with the peripheries of said disks and causing the operation of said tracer-bar thereby when subjected to pressure, substantially as described.

22. In a retracting mechanism for automatic carving machines, the oppositely rotated friction-disks, in combination with the tracer-bar having parts for engagement with the sides of said disks, clutch parts geared to said bar for engagement with and operation

by the peripheries of said disks, as and for the purpose specified.

23. A retracting mechanism for automatic carving machines, comprising oppositely rotated friction-disks, in combination with a tracer-bar parts on said bar for engagement with the sides of said disks when the bar is subjected to pressure of a moving pattern and auxiliary disk-periphery-engaging parts movable with the disks and with the bar and causing the movement of the bar when it is subjected to side pressure, substantially as described.

24. In a retracting mechanism for carving machines, the oppositely rotated friction-disks, in combination with a longitudinally movable tracer-bar arranged between said disks and having parts in engagement with the sides thereof and auxiliary friction-parts in rolling attachment with said bar and slidably engaged with said disks, substantially as described.

25. In a retracting mechanism for carving machines, the oppositely rotated friction-disks, in combination with a longitudinally movable tracer-bar arranged between said disks and having parts in engagement with the sides thereof, and auxiliary friction-parts in rolling attachment with said bar and fitting upon and slidably engaged with the peripheries of said disks, substantially as and for the purpose specified.

26. In a retracting mechanism for carving machines, the friction-disks, rotated in opposite directions, in combination with a longitudinally movable tracer-bar and the curved racks interposed between said bar and said disks, meshing with said bar and frictionally engaged with said disks, substantially as described.

27. In a retracting mechanism for carving machines, the oppositely rotated disks, in combination with the tracer-bar arranged between them, the racks upon said bar, the curved racks engaged therewith and fitting the peripheries of said disks for imparting movement to said tracer when the latter is subjected to pattern-pressure, substantially as described.

28. In a retracting mechanism for carving machines, the oppositely rotated disks, in combination with the tracer-bar arranged between them, the straight racks and the straight surfaces provided upon opposite sides of the tracer bar, and the curved racks concentric with said disks and engaging said straight racks, said racks having curved surfaces to roll on said straight surfaces, substantially as described.

29. In a retracting mechanism for carving machines, the oppositely rotated disks having parallel axes, in combination with the tracing-member arranged between said disks, the rolling friction-clutch parts connected with said bar and engaging the peripheries of respective disks, and means for taking up lost motion between said disks, clutch parts and bar, substantially as described.

30. In a retracting mechanism for carving machines, the oppositely rotated disks, in combination with a tracer-bar, peripheral friction-clutch parts upon said disks, held in rolling engagement with said bar, and adjustable bearings for said disks for taking up lost motion and wear in said clutches, substantially as described.

31. In a retracting mechanism for carving machines, suitable bearings, in combination with bushings provided therein, parallel shafts eccentrically arranged in said bushings, means for rotating said bushings, the disks upon said shafts and the tracer-bar equipped with parts that are peripherally engaged with said disks, substantially as described.

32. In a retracting mechanism for carving machines, the pair of oppositely rotated disks, in combination with eccentric rotatable mountings therefor, a tracer-bar arranged between said disks, peripheral clutch parts interposed between said bar and disks and means for adjusting and securing the eccentric mountings of said disks, substantially as described.

33. In a retracting mechanism for carving machines, the oppositely rotated disks, in combination with the shafts thereof, a pair of rotatable eccentrically-mounted bearings for each shaft, a connecting yoke for each pair of bearings, locking-means in connection therewith, the cutter-actuating member and peripheral clutch parts upon said disks and in rolling surface connection with said member, substantially as described.

34. In a retracting mechanism for carving machines, the oppositely rotated disks, in combination with the shafts thereof, the bearing boxes, the bushings having eccentric openings wherein said shafts are held, adjusting means for pressing the said bushings upon said disks, to prevent longitudinal movement thereof and a tracer-bar frictionally engaged with said disks, substantially as described.

35. In a retracting mechanism for carving machines, the parallel shafts, in combination with suitable bearings therefor, the disks arranged on said shafts and each comprising a metal core having a non-metallic periphery and sides, a tracer-bar arranged between the peripheries of said disks, friction-parts upon said bar for engagement with the non-metallic sides of said disks and partially revoluble clutch parts upon said bar for engagement with the non-metallic peripheries of said disks, substantially as described.

36. In a retracting mechanism for carving machines, the oppositely rotated disks, having parallel axes, in combination with a

tracer-bar longitudinally movable, between the peripheries of said disks, the curved clutch parts fitting the peripheries of said disks, in rolling attachment with said bar, sustained by said bar and operable with said disks to retract said bar when the latter is subjected to lateral pressure, substantially as described.

In testimony whereof, I have hereunto set my hand this 30th day of October, A. D. 1903, in the presence of two witnesses.

HENRY C. BAASE.

Witnesses:
MARTIN D. TAMBLE,
ELIZABETH RAINEY.