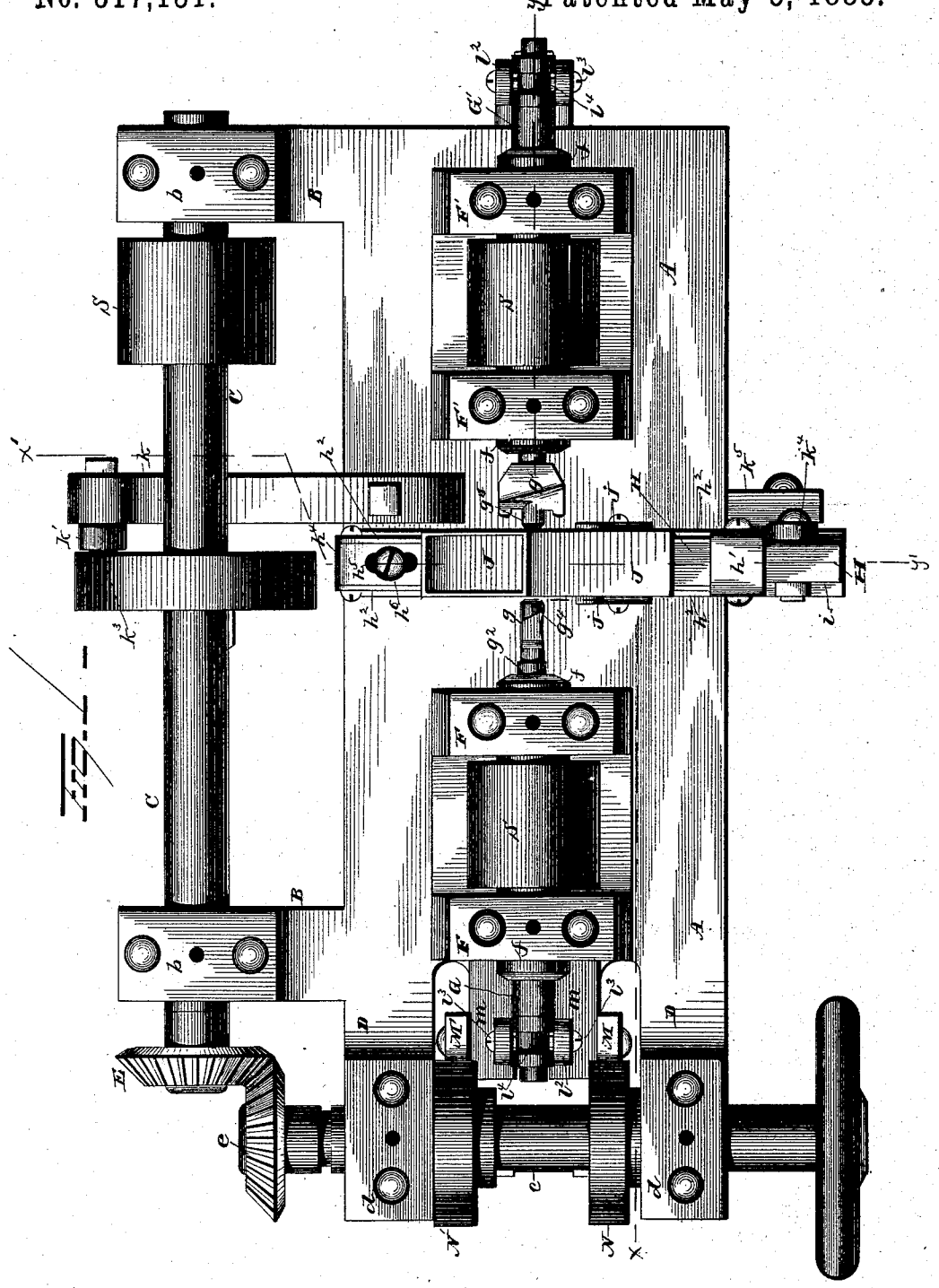
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W. R. HARTIGAN.

HUBBING MACHINE.

No. 317,131. Patented May 5, 1885.



WITNESSES

E. C. Nottingham

Geo. F. Downing

INVENTOR

W. R. Hartigan

By H. A. Seymour

ATTORNEY

N. PETERS, Photo-Lithographer, Washington, D. C.

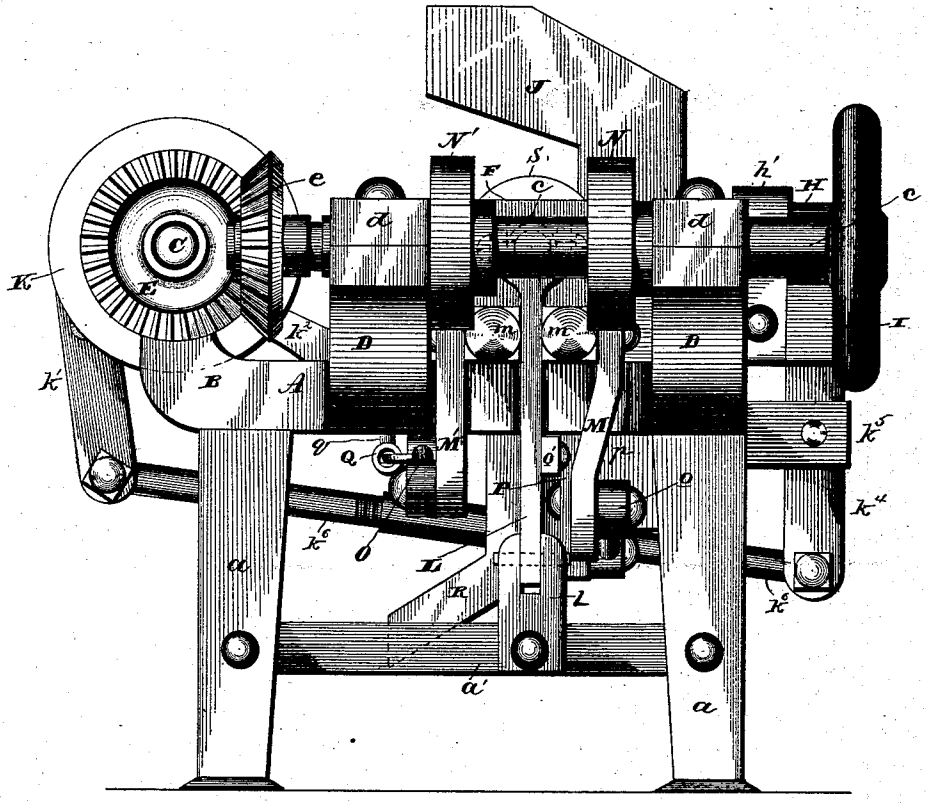
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Fig. 2



WITNESSES
E. Nottingham
Geo. F. Downing

INVENTOR
W. R. Hartigan
By H. A. Seymour.
ATTORNEY

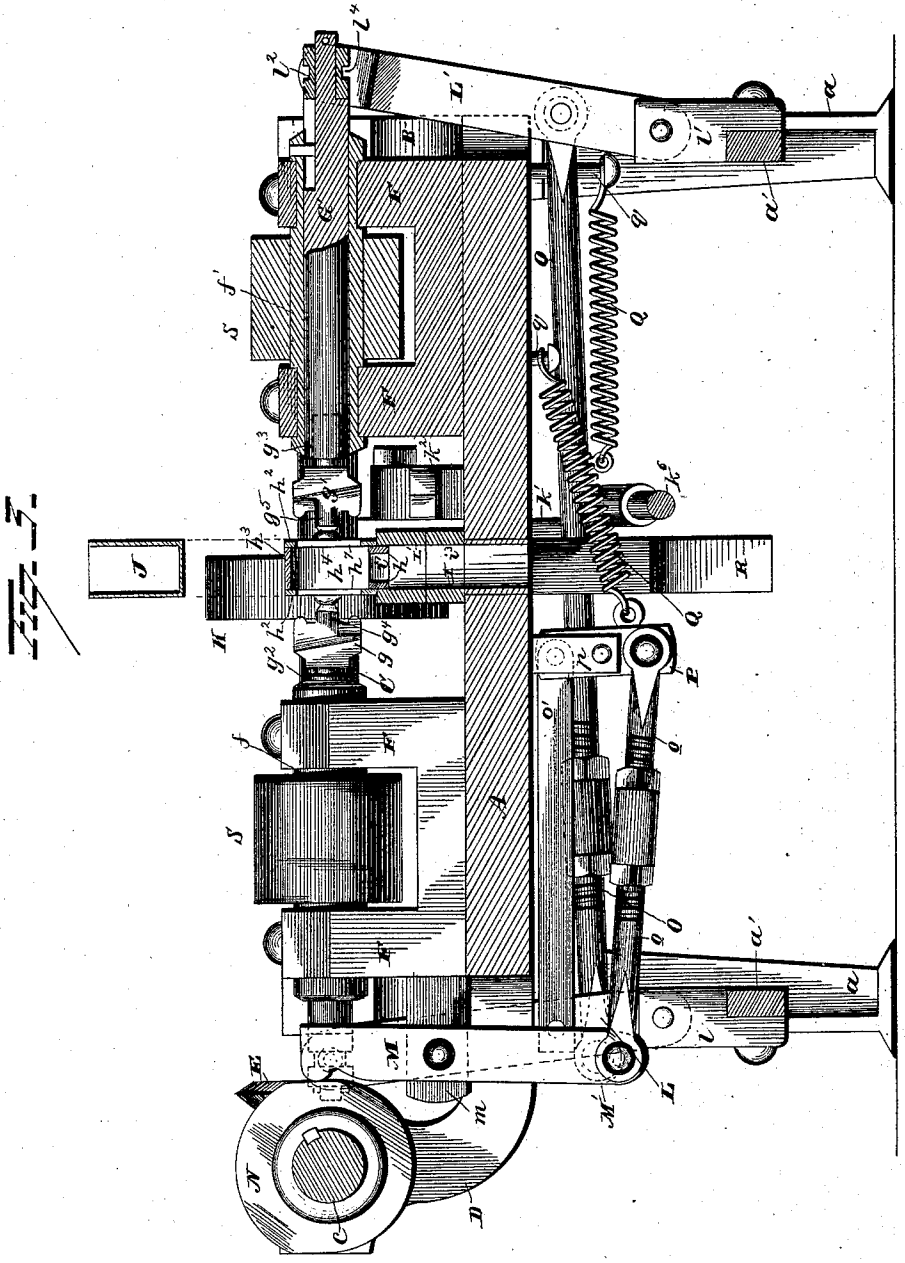
N. PETERS. Photo-Lithographer, Washington, D. C.

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WITNESSES

E. Nottingham

Geo. F. Downing

INVENTOR

W. R. Hartigan

By H. A. Seymour.

ATTORNEY

N. PETERS. Photo-Lithographer, Washington, D. C.

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Fig. 4

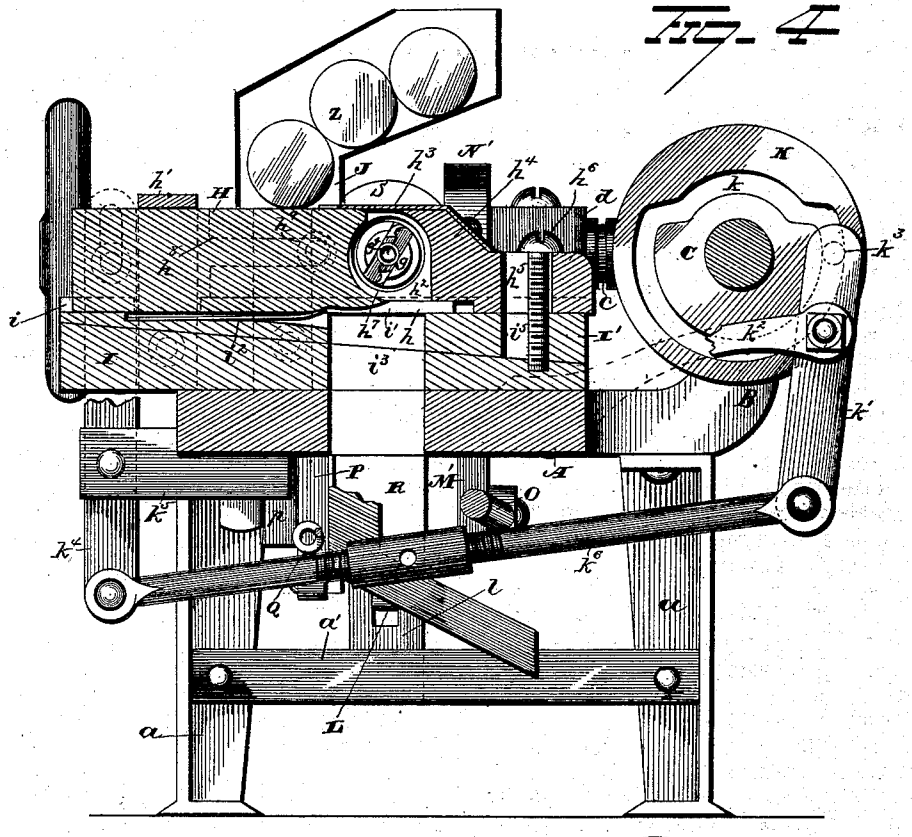
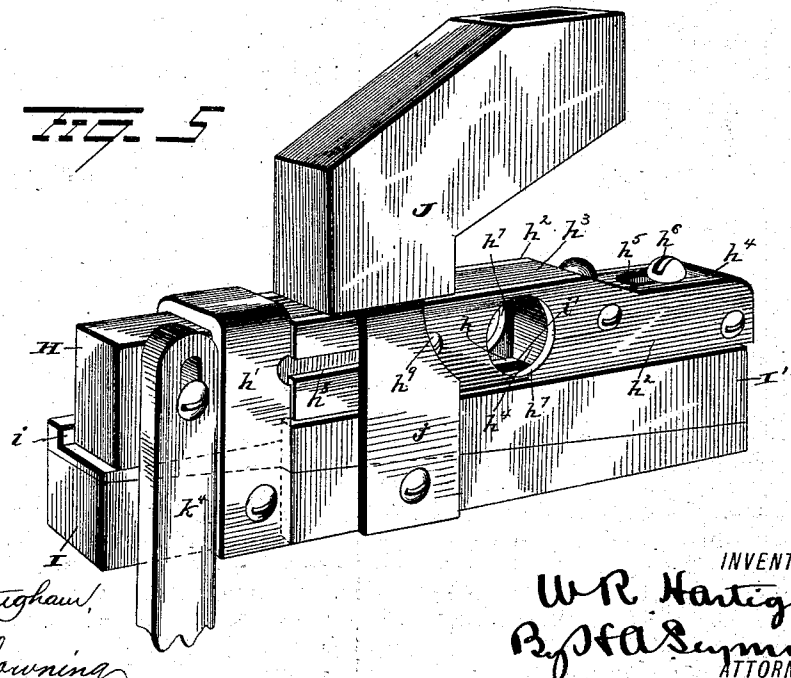


Fig. 5



WITNESSES

C. C. Nottingham.

Geo. F. Downing.

INVENTOR

W. R. Hartigan.

By H. A. Seymour.

ATTORNEY

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM R. HARTIGAN, OF COLLINSVILLE, CONNECTICUT.

HUBBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 317,131, dated May 5, 1885.

Application filed October 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. HARTIGAN, of Collinsville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hubbing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in hubbing-machines, the object of the same being to provide a machine which shall simultaneously form the annular grooves in the opposite sides of a skate-roller or other wheel, by which a hub is formed, a further object being to provide improved means for feeding, clamping, and discharging the blanks, a further object being to provide an effective, durable, and compact machine.

With these ends in view, my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of the machine. Fig. 2 is an end elevation. Fig. 3 is a vertical longitudinal section through the line *x y* of Fig. 1. Fig. 4 is a vertical transverse section through the line *x' y'* of Fig. 1, and Fig. 5 is a detached view of the feed-discharge and clamping mechanism.

A represents the bed of the machine, supported upon suitable legs, *a*, connected by the end girders, *a'*. The rear side of the bed A is provided with the upwardly-extending lugs or arms B, one at each end, provided with suitable bearings, *b*, in which the feed driving shaft C is journaled. One end of the bed A is provided with the upwardly-extending arms D, having suitable bearings, *d*, in which the cross-shaft *c* is journaled. The end of shaft C is provided with a beveled gear-wheel, E, rigidly secured thereon, which engages a beveled gear-wheel, *e*, rigidly secured on the end of shaft *c*. Two pairs of upwardly-extending ears or lugs, F and F', are firmly secured to the bed A, and provided with suitable bearings, in which the sleeves *f* and *f'* are journaled in the same horizontal line.

Within the sleeves *f* and *f'* the spindles G and G' fit and have a sliding motion, and are caused to rotate with the sleeves by a feather and groove or equivalent device. The inner ends of the spindles G and G' are provided with sockets, in which the stems of the cutters *g g'* are received and held. The cutters *g g'* are provided with centering-teats $g^4 g^5$, respectively.

The roller-blanks, which are first bored, are fed to, held between, and discharged from the cutters by mechanism operated by a cam on the shaft C, and the spindles are advanced into contact with the blanks by mechanism driven by cams on the shaft *c*, all of which will be explained in detail in the order above stated.

A carriage or movable dog, H, is constructed to slide transversely on a bed, I I', the latter being secured firmly to the bed A, transversely thereon, below and midway between the cutters *g g'*. The rear end of H is cut away, as shown, the lower portion, *h*, extending rearwardly, and forming a rest for one of the blanks *z*. The dog H is guided in its transverse motion by a groove, *i*, in the face of the bed I, and is held against an upward displacement by a strap, *h'*, secured to the bed I on either side. The dog H is inclosed by two side plates, h^2, extending from the rear end of the bed I forwardly to the strap *h'*, the two plates being bolted firmly together and provided with an upper plate, h^3, forming a cover as far forward as the feed-channel J. A stationary dog, h^4, against which the blanks are fed by the movable dog H, is firmly secured between the sides h^2 at a point a short distance to one side of the cutters, and is provided with an oblong slot, h^5, near its rear end, through which a set-screw, h^6, passes into the bed I, and thereby holds the dog h^4 and the box formed by the plates h^2 and h^3 in the desired adjustment on the bed I. The side plates, h^2, are cut away at h^7, to admit the cutters, and are provided with the oblong open slots h^8, to admit screws or studs h^9, set in the sides of the dog H, whereby the forward ends of the plates are held more firmly in position on the bed I. The rearwardly-extending portion *h* of the dog H is provided with a vertical open slot, *i'*, through which the upturned end of a flat spring, i^2, projects when the dog

is in its adjustment farthest from the cutters. The spring i^2 is secured in a recess in the face of the bed I, and serves to prevent the blank, when it drops from the feed-channel onto the rest h, from rolling forwardly and dropping down through the discharge-channel i^3 in the bed I. As the dog H moves toward the cutters the spring is depressed into its recess, and when the dog returns, after the wheel has been hubbed, the spring rises through the slot i' and rolls the wheel rearwardly to the discharge i^3.

The bed I is formed of two wedge-shaped sections, the upper section, I', being adjustably secured on the lower section by means of the set-screw h^6, passing through the oblong vertical slots h^5 and i^5 into the rigid lower section, by which adjustment the dogs are elevated or depressed to suit blanks of different diameters.

The feed channel or hopper J is secured to the bed I by means of branches j, which extend downwardly on either side of the plates h^2. The rest h on the dog H, when the dog is at its farthest point from the cutter, is located beneath the lower end of J in a position to receive a blank therefrom, and as the dog advances it closes the feed, thus carrying one blank at a time between the cutters, and on its return discharging the one and receiving the next preceding.

The dog H is reciprocated as follows: A wheel, K, rigidly mounted on the shaft C, is provided with a cam-groove, k, on its face. A lever, k', is pivotally secured to a rearwardly-extending arm, k^2, on one side of the machine, the upper end of the said lever being provided with a stud, k^3, which engages the cam-groove k. A lever, k^4, is pivotally secured to a forwardly-extending arm, k^5, on the opposite side of the machine, the upper end of k^4 being pivotally attached to the end of the dog H. The lower ends of the levers k' and k^4 are connected by a rod, k^6, below the bed A, said rod being adjustable in length, whereby the advance of the dog H is increased or diminished at pleasure.

The spindles G G', carrying the cutters, are reciprocated as follows: Two vibrating arms, L and L', situated at opposite ends of the machine, are pivotally secured at their lower ends between lugs $l\,l'$, attached to the cross-girders a'. The upper ends of L and L' are provided with curved branches l^2, which extend somewhat more than half-way around the outer ends of the spindles, each pair of branches being provided with inwardly-extending adjustable studs l^3, adapted to extend and loosely fit within annular grooves l^4 on the ends of the spindles at points diametrically opposite, thus allowing the spindles to revolve freely between the said studs, and at the same time affording a secure hold on said spindles for moving them longitudinally and holding them in longitudinal adjustment. Two upright levers, M M', located at one end of the machine, are pivotally secured to arms m, the upper ends of the levers being adapted to engage the faces of the cam-wheels N N', rigidly secured on the shaft c, and their lower ends connected with the arms L L'. The lower end of lever M' is connected directly with the arm L' by the adjustable connecting-rod O. The lower end of lever M is indirectly connected with the arm L by means of an intermediate lever, P, pivoted to a depending support, p, the lower end of P being connected with the lower end of M by an adjustable rod, o, and the upper end of P connected with the arm L by a rod, o'. By the above construction the two arms L and L', and hence the cutters, are caused to simultaneously approach each other when the levers M M' are simultaneously operated by the cams N N'.

The cutters are caused to recede from each other as fast as the arms N N' will allow by means of springs Q, attached, respectively, to the connecting-rod O and the lower end of lever P, and to studs q, set in the bed A. The adjustable rods O and o enable the operator to determine the advance of the cutters toward each other, and hence the depth of groove cut on each side of the blank.

A spout, R, is secured to the under side of the bed A to guide the hubbed wheel into a suitable receptacle.

The shaft C and each of the spindle-sleeves f and f' are provided with band-pulleys S, and are driven by suitable pulleys on a counter-shaft or on counter-shafts. (Not shown.) The sleeves f and f' are driven in opposite directions, whereby the rotary pressure on the blank caused by the cutters engaging therewith is equalized, and the stationary and movable dogs are relieved from strain, and enabled to hold the blank securely with a comparatively light pressure.

The operation of the machine as a whole is as follows: The spindles carrying the cutter-heads are rapidly revolved by suitable driving-pulleys. The revolving shaft C, driven at a suitable speed, advances the dog H with a blank and holds the blank between the cutters, while the revolving shaft c, driven by C, advances the cutters into engagement with the blank and releases them therefrom, at which moment the cam on C returns the dog H for a new blank.

The centering-teats g^4 g^5 serve to steady the blanks while being operated upon by the cutting-edges, and prevent any possibility of a wabbling movement and an irregular groove.

It will be observed that the machine constructed as above described is substantial and compact, and does its work rapidly and correctly, the labor of the operator consisting in keeping a supply of blanks in the hopper and room for the hubbed wheels in the receptacle.

It is evident that slight changes may be made in the form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hubbing-machine, the combination, with two rotary cutters located in the same plane and opposite each other, and provided with centering-teats, and levers and connecting mechanism for simultaneously reciprocating said cutters in opposite directions, of a movable dog located at a point between the cutters, and adapted to feed and hold the wheels between the cutters, substantially as set forth.

2. In a hubbing-machine, the combination, with two rotary cutters located in the same plane and opposite each other, provided with centering-teats, and means for simultaneously reciprocating the cutters in opposite directions, of the movable dog and a spring located below and operated by the movable dog, whereby the blank is retained on the dog, advanced between the cutters, and ejected from the dog, substantially as set forth.

3. In a hubbing-machine, the combination, with two reciprocating rotary cutters located in the same plane and opposite each other, of a stationary dog located on a line passing between and at right angles to the cutters, and a movable dog operating in conjunction with the stationary dog, whereby the blank is advanced and clamped between the cutters, substantially as set forth.

4. In a hubbing-machine, the combination, with two reciprocating rotary cutters located in the same plane and opposite each other, of an adjustable stationary dog, and a reciprocating dog located on a line passing between and at right angles to said cutters, a spring operated by the reciprocating dog, and an adjustable dog-support, whereby blanks of different sizes are automatically fed to the cutters, clamped, and discharged, substantially as set forth.

5. In a hubbing-machine, the combination, with two reciprocating cutters located in the same plane and revolving in opposite directions, of a combined reciprocating dog located on a line passing between and at right angles to the cutters and carriage, and a stationary dog operating in conjunction with the movable dog and carriage, whereby the blanks are fed between the cutters and clamped while being operated upon by the cutters, substantially as set forth.

6. In a hubbing-machine, the combination, with two reciprocating rotary cutters, a stationary dog, and a movable dog adapted to serve as a carriage, of a dog-supporting bed, consisting of a stationary lower section having an inclined face and an adjustable upper section having an inclined face, whereby the dogs are elevated or depressed to suit different-sized wheels, substantially as set forth.

7. In a hubbing-machine, the combination, with a pair of rotary cutters located in the same plane and opposite each other, and means for feeding a wheel between said cutters, of a shaft, a pair of rotary cams mounted on said shaft, and levers and pitman connecting the cams and cutter-spindles, whereby the cutters are simultaneously advanced toward the wheel, substantially as set forth.

8. In a hubbing-machine, the combination, with the rotary cutters, vibrating arms located at opposite ends of the machine-frame in loose engagement with the ends of the cutter-spindles, and levers located at one end of the machine and operated by a pair of rotary cam-wheels, of rods connecting the vibrating arms and the levers, said rods being adjustable in length, whereby the cutters are reciprocated and the length of stroke determined, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WM. R. HARTIGAN.

Witnesses:
WM. A. WADSWORTH,
GEORGE E. TAFT.