No. 880,413. PATENTED FEB. 25, 1908.

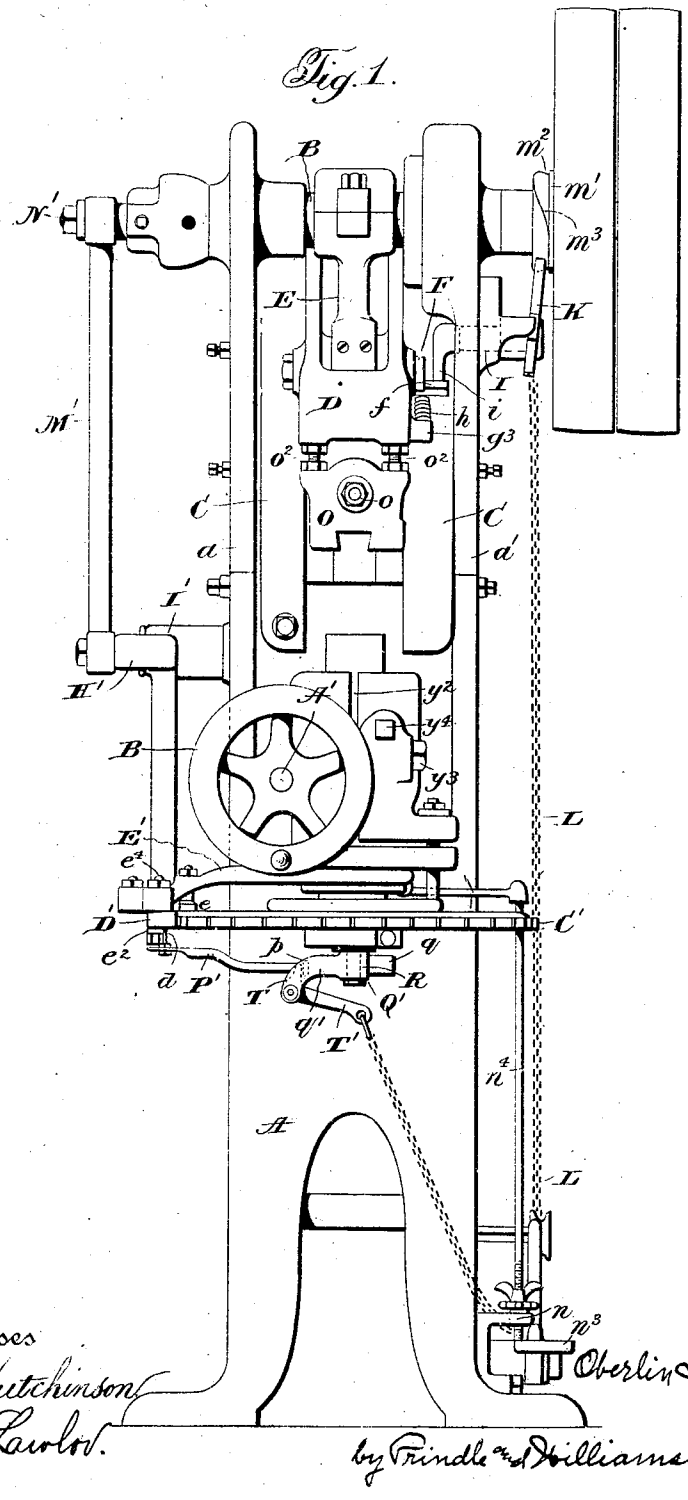
O. SMITH.

NOTCHING PRESS.

APPLICATION FILED MAR. 14, 1905.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Jas. E. Hutchinson

J. L. Laurlor.

Inventor

Oberlin Smith,

by Prindle and Williamson, Attorneys.

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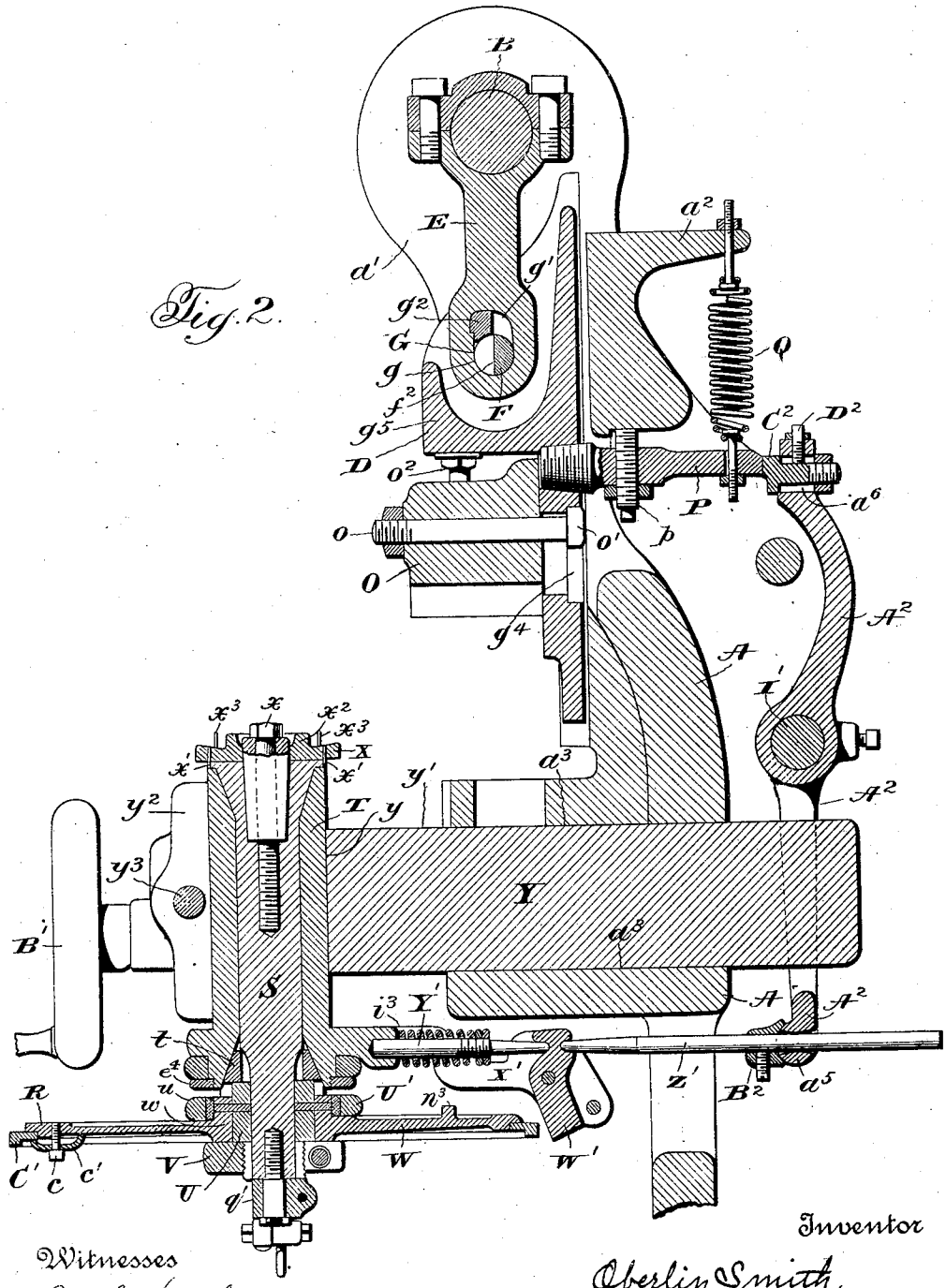
5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

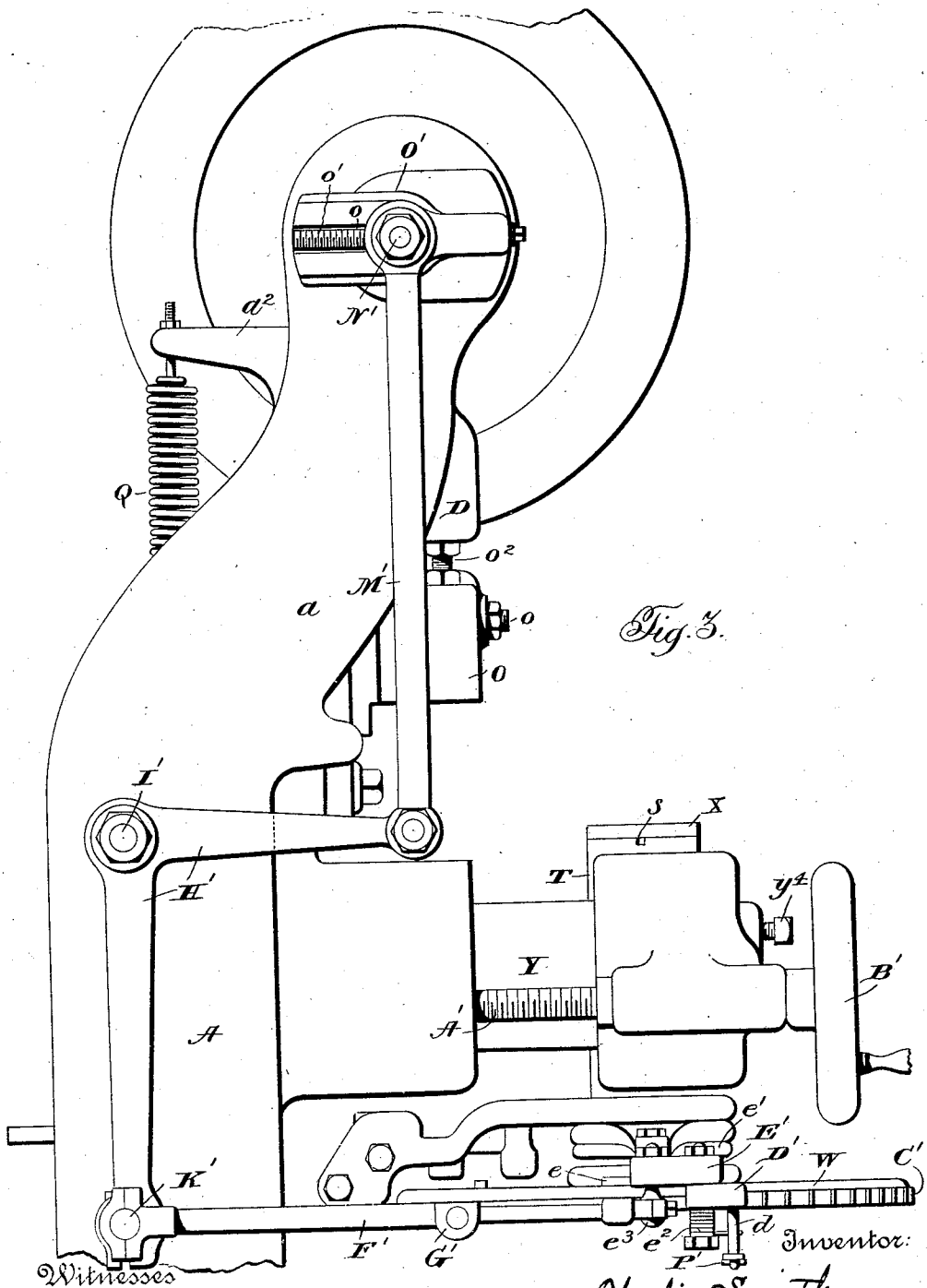

Fig. 3.

Witnesses

Jas. C. Hutchinson.

J. L. Lawlor.

Inventor:

Oberlin Smith,

by Pindle and Williamson, Attorneys

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O. SMITH.

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5 SHEETS—SHEET 4.

Fig. 4.

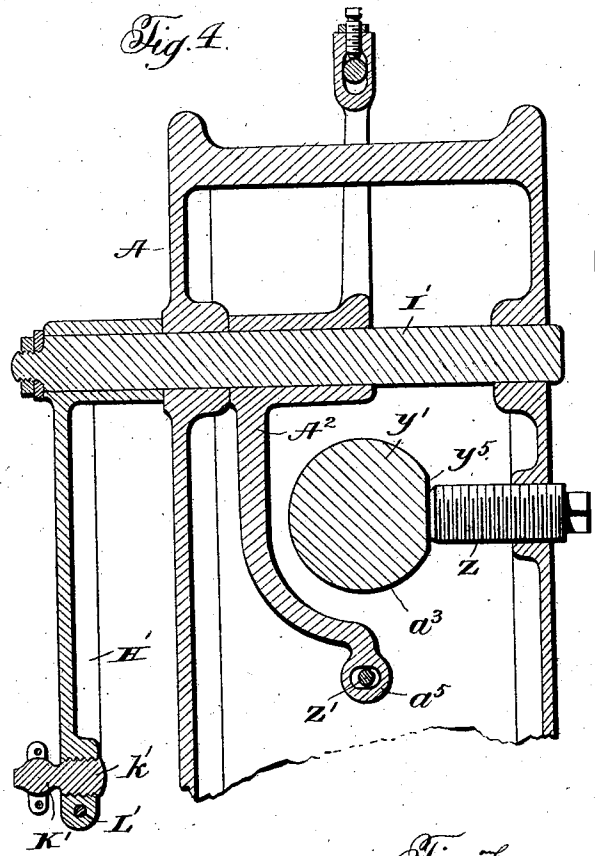


Fig. 5.

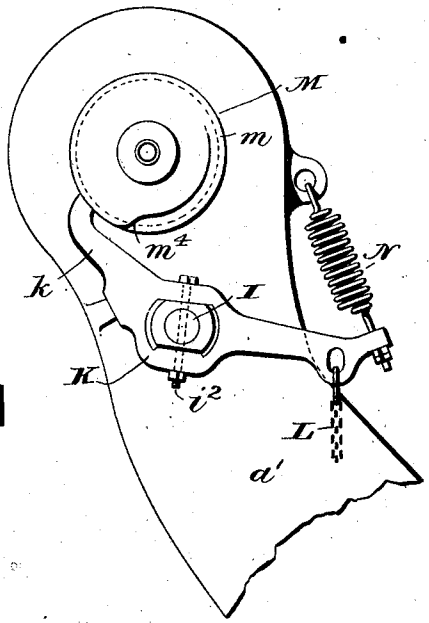


Fig. 6.

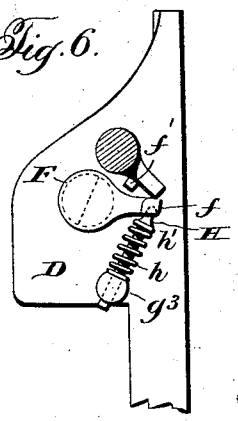


Fig. 7.

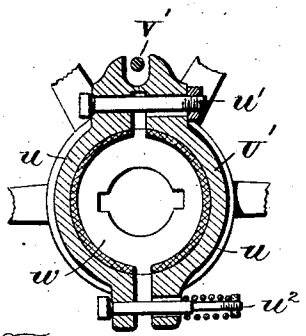


Fig. 8.

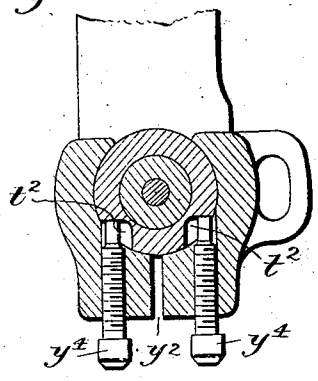
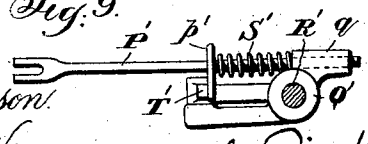


Fig. 9.



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5 SHEETS—SHEET 5.

Fig. 11.

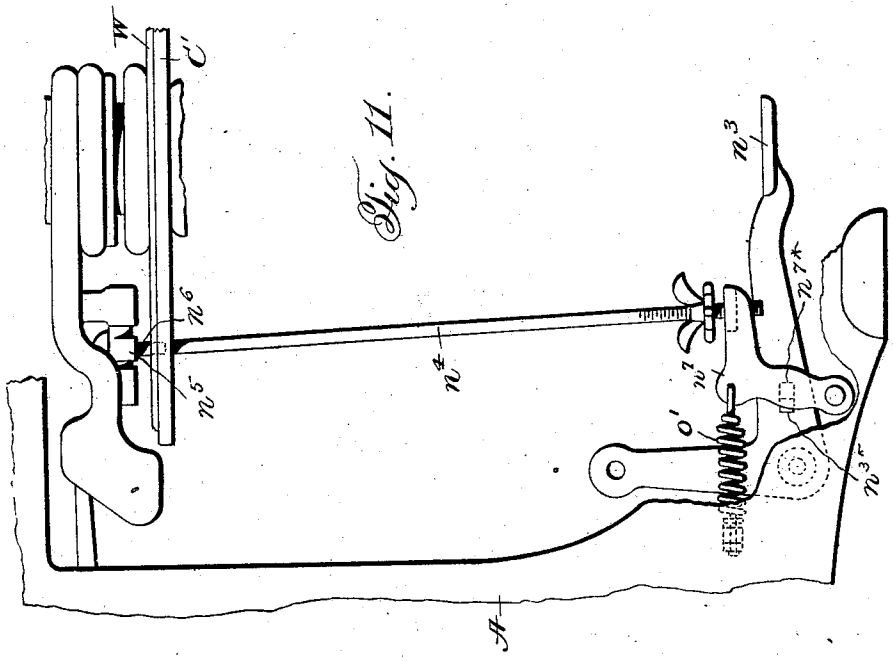
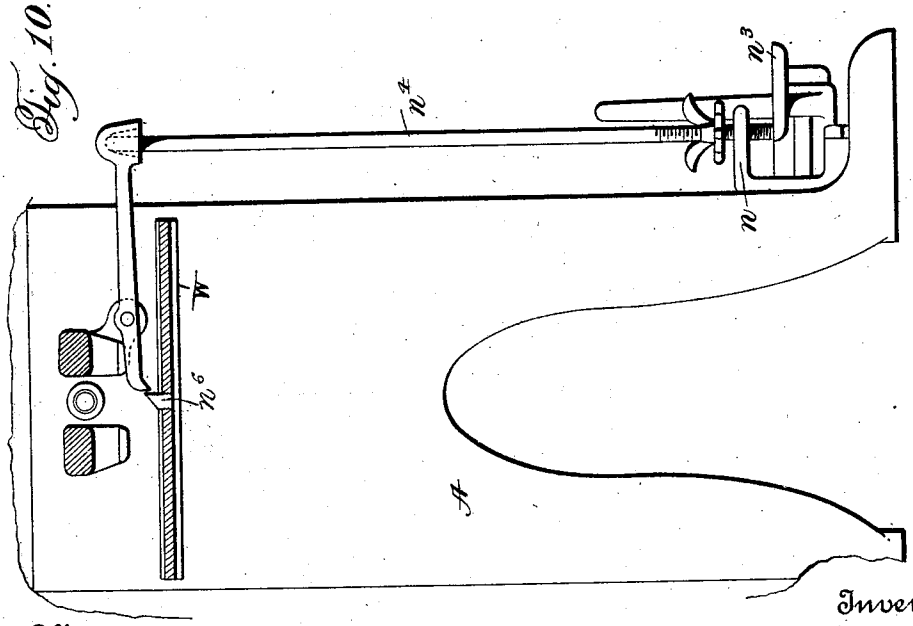


Fig. 10.



Witnesses

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by Pindle and Williamson, Attorneys

UNITED STATES PATENT OFFICE.

OBERLIN SMITH, OF BRIDGETON, NEW JERSEY.

NOTCHING-PRESS.

No. 880,413. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed March 14, 1905. Serial No. 250,066.

To all whom it may concern:

Be it known that I, OBERLIN SMITH, of Bridgeton, in the county of Cumberland and in the State of New Jersey, have invented a certain new and useful Improvement in Notching-Presses, and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a press embodying my invention; Fig. 2 is a central, vertical, longitudinal section of Fig. 1; Fig. 3 is a side elevation of the press illustrated in Fig. 1; Figs. 4, 5, 6, 7 and 8 are, respectively, partial sectional views; Fig. 9 is a detail view of the pawl-controlling mechanism; Figs. 10 and 11 are views of the treadle mechanism.

The object of my invention has been to provide a press which is adapted to punch notches in disks of sheet material, such as armature disks, which press shall be capable of operating at a high rate of speed, and producing work of such accuracy as not to require other finishing, which press shall be durable and readily adjustable to different sizes of work, and shall be provided with devices that will prevent the operation of the press when the disk is not in proper position to be notched, and to such ends, my invention consists in the notching press hereinafter specified.

In carrying my invention into practice, I provide a frame A, consisting of side sections a and a', which are connected at various points by parts, preferably forming one integral structure with the side sections. At their upper ends, the side sections of the frame are provided with bearings for the crank shaft B. Guides C are formed in the face of a web connecting the side sections of the frame, and a ram D is mounted in said guides, the said ram receiving motion from a crank on the crank shaft by a pitman E. The ram has a clutch pin F journaled between side webs formed on the ram, the clutch pin passing through an opening G in the lower end of the pitman. The pin F is semi-circular in cross-section where it passes through the opening G, and such opening consists of a circular portion g and a portion g' extending above that half of the circular portion which is normally occupied by the semi-circular clutch pin F. The adjacent portion of the circular opening g is formed by a hardened block g^2, so that the clutch-pin, which is also hardened, will not injure such portion of the pitman when it comes in contact therewith, as hereinafter described.

The clutch pin is provided with an arm f that is engaged by a bolt H, which latter passes loosely through an opening in a lug g^3 formed on the ram, a spring h being interposed between the said lug and a shoulder h' on the said bolt. The spring h tends to throw the arm f against a stop f' on the ram, and when in such position causes the clutch pin F to be turned so that its periphery extends under the block g^2, thus locking the ram and pitman together, and causing the ram to descend with the pitman. A rock-shaft I is pivoted in the frame section a, and is provided with an arm i, which is adapted to be swung into position, so that, when the ram rises, it will force the arm f down against the action of the spring-bolt H, and thus throw the surface f^2 of the clutch pin into vertical position, so that the block g^2 can pass freely by the clutch pin, and the pitman be permitted to move without carrying the ram with it.

The rock-shaft I has a cam lever K swiveled to its outer end by a bolt i^2, the said lever being connected by a chain L with the treadle of the machine, so that, on depressing the treadle, the arm i may be operated. In order that the treadle may not be depressed, except at such time as the work is in position, the lever K is provided with an arm k which is adapted to engage a timing cam M that is mounted upon the crank-shaft. Such cam is provided with a peripheral groove m having one substantially vertical wall m', and said groove has a bottom m^2 inclined toward the shaft in a direction toward the wall m', the said groove having a spiral wall m^3, which merges into the vertical wall m'. When the lever K is depressed by the treadle, the arm k engages the bottom of the groove m^3, and is prevented, by the inclined position of such bottom, from working off the cam. As the cam revolves, the arm k drops into a depression m^4 formed in the bottom m' adjacent to the spiral wall m^3, and the arm is thrust off the cam by the said spiral wall, so that the lever can be completely depressed and operate the latch arm i. The lever is held in an elevated position by a spring N which is connected with such lever and with an eye on the frame. A ram block O, which is adapted to have the punch and stripper attached thereto, is adjustably secured to the

ram, in any desired manner. The ram block, in the instance chosen for illustration, is secured to the ram by a bolt *o* passing through the ram and having its head *o'* in engagement with a T-shaped slot g^4 formed in the ram. The ram block can be adjusted on the ram by bolts o^2 passing through the ram and engaging the upper side of the block O. An arm P is secured in the ram, as by being threaded into a conical hole therein, and such arm is engaged by a spring Q that is supported by an arm a^2 on the frame, thus normally tending to hold the ram in elevated position. The arm P carries a stop-screw *p* which, by contact with an overhanging portion of the frame, determines the normal, upper position of the ram. The disk which is to be notched, is mounted upon the upper end of a disk spindle S, the latter being mounted in a bearing T, the upper end of the spindle being made conical to permit taking up of wear. A conical bushing *t* fits on the lower end of the disk spindle, and is received in a conical recess in the bearing T. The spindle has a collar U spindle thereon, which bears against the bushing *t*, and which is adjusted by means of a clamp-nut V, screwed on the lower end of the spindle. The collar U has the ratchet spider W pinned, or otherwise secured thereto, which spider will be more fully referred to hereafter. The disk to be notched is secured to the spindle by a collar X, which latter is fastened in place by a bolt threaded axially into the spindle. For disks to be used upon shafts of different sizes, collars X of corresponding sizes are provided. The spindle S has a cross-slot *s* formed in its upper surface, and each collar X has a conical shank that is adapted to be received in a conical socket formed in the spindle S, the collar being fastened in place by a bolt *x* that passes through the collar. To prevent rotation of the collar in the spindle, the collar is provided with a pin or pins *x'* that is adapted to be seated in the slots *s* in the spindle. The upper surface of each collar X has a circular boss x^2 over which the hole in the collar to be notched is passed, and pins x^3 on the collars X prevent rotation of the armature disks on said collars. The spindle bearing T is mounted in a cylindrical opening *y* in a slide Y that is preferably provided with a cylindrical body *y'*, which is received in a horizontal cylinder opening a^3 in the frame. The forward end of the slide is provided with a slot y^3 opening into the cylindrical passage *y*, the ears thus formed being connected by a bolt y^3, so that the disk spindle and bearing can be adjusted vertically, and can be secured in adjusted position by tightening the bolt y^3. Screws y^4 and y^4 are mounted in the ears on opposite sides of the slot y^2 and bear against shoulders formed by recesses t^2 formed in the bearing T. The bearing T, and the parts carried thereby, can be adjusted axially, by means of the screws y^4. The body *y'* of the slide Y is preferably provided with a plain surface y^5 upon one side, and a screw Z mounted in the frame serves to keep the axis of the disk spindle vertical, when tightened against the said surface y^5. A screw-shaft A' is journaled in a bearing formed in the slide Y, and is threaded into an opening in the frame A, the said shaft being provided with a hand-wheel B'. By turning the hand-wheel B', the slide, and with it the disk spindle, can be adjusted toward or from the frame to accommodate the machine to disks of different diameters.

Ratchet rings C' are secured to the ratchet spider W in any desired manner, as by screws *c* engaging levers *c'*, one end of which rests against the spider, and the opposite end against the ratchet disk, the disk thus being forced into a seat formed in the periphery of the spider. By simply loosening the screw *c* and turning the levers *c'* from off the ratchet disk, a disk of different diameter may be quickly substituted. The teeth of the ratchet disk are engaged by a pawl D' that is carried by a pawl arm E', the latter being journaled on the spindle bearing T, and being held in place by nut *e'*. The arm E' may conveniently be supported upon the upper face of the ratchet spider, as by a shoe *e* carried by such arm. The pawl D' is pivoted upon a bolt e^4 that is fixed in the arm E', a spring e^2 being coiled about the said bolt and engaging a pin *d* on the pawl, thereby tending to throw the pawl against the ratchet disk. A telescopic connecting rod F', preferably formed of two sections of light tubing, connected by a clamp collar G', serves to connect the pawl arm E' with a rock arm H'. The rock arm is journaled upon a stud I' mounted in the frame. The forward end of the rod F' engages, by means of a suitable strap, a spherical pin e^3, carried by the pawl arm. The rearward end of the rod F' engages a spherical pin K', the latter having an eccentrically-formed shank *k'* which is screwed into the lower arm of the bell crank in a split hole, the shank being held in adjusted position by a bolt L' connecting the ears in which the said hole is formed. The upper arm of the bell crank is connected by a rod M' with a crank pin N' that is mounted in a slot *o* formed in a crank O', the pin being adjusted in the said slot by means of a screw *o'* mounted in the crank and extending through the slot.

In order to release the pawl when the machine is stopped and hold it out of operative position, a bifurcated rod P' is slidably mounted in a lug *q* formed on a collar Q', the latter being journaled on a bolt R' that is threaded into the lower end of the spindle disk. The rod P' is forked at its outer end to embrace the pin *d* on the pawl, the pin

being provided with a collar and nut between which the bifurcated end of the rod is received. A collar p' is secured upon the rod P′ and serves for engagement by one end of a spring S′ coiled about the said rod, the opposite end of the spring bearing upon the lug q, the spring thus tending to thrust the rod P′ toward the pawl and to swing the pawl out of engagement with the ratchet disk. In order to compress the spring and hold the rod P′ from throwing the pawl into inoperative position when the machine is working, a lever T′ is fulcrumed on an ear q' formed on the collar Q′, one arm of the said lever engaging the collar p on its side opposite to the spring S′, and the opposite arm of the lever being connected by a chain with the treadle. By this means, when the treadle is depressed the lever T′ will be swung to force the rod P′ back against the stress of the spring and thus to prevent the rod from disengaging the pawl. When, however, the treadle is elevated, the chain is slackened, and the spring forces the rod P′ toward the pawl and causes the disengagement of the latter.

In order to prevent undesirable overthrow of the feed, a brake U′ is mounted upon the hub W of the ratchet spider, the brake being in the form of two half rings u which embrace the said hub, the rings or the hub being preferably leather-faced. Ears are formed on the said half rings, which ears are connected by bolts u' and u^2 respectively, passing therethrough, one of such bolts having a spring interposed between its nut and the adjacent ear to cause a yielding compression of the hub by the brake. The brake engages a pin V′, formed in any manner on the slide T, the pin extending through an opening in the brake, the opening being formed in any desired manner and being larger in a tangential direction than the pin, so that the brake is permitted a rotary movement independent of the pin.

To lock the ratchet disk while the punching is taking place, a locking lever W′ is pivoted upon a bracket X′ formed on or attached to the disk spindle bearing T. A spring-bolt Y′ engages a recess in one side of the locking lever, and tends to throw the latter into engagement with the ratchet teeth, and a rod Z′ engages a recess in the other side of the locking lever, for the purpose of swinging the lever to unlocked position. The rod Z′ passes through a spherical knob a^5 formed on the lower end of a lever A^2. A block B^2 having a spherical bearing surface is secured upon the rod Z′, as by a set screw in proper position to engage the knob a^5. The lever A^2 is fulcrumed by a sleeve upon the stud I′, the upper arm of the lever being provided with a bearing block C^2 which is adjustably mounted in the said end. The said block has a shank passing through a slot a^6 in the lever, which shank is threaded to receive a nut, by which it is clamped in the said slot. The block is adjusted in the slot by a screw D^2 threaded in the lever end and bearing against the shank of the block C^2. A lock nut is, of course, preferably provided for the screw. The bearing block C^2 is engaged by the upper end of the arm P, the arm and block being provided with beveled surfaces, so that, as the arm rises with the ram, the block is thrust backward, thus swinging the lever A^2 and causing the locking lever W′ to be released. When the ram descends, the arm P passes below the inclined surface of the block C^2, thus permitting the spring Y′ to swing the locking lever into engagement with the teeth of the ratchet disk. The teeth of the ratchet disk and the locking lever are beveled, so that the latter will properly position the ratchet disk, if it is out of position.

The treadle n^3 is held down by a lug n^{7*} on a latch n^7 which lug engages a lug n^{3*} on the treadle, said latch being operated by a treadle rod, the latter being adjustable in length and being operated by a lever n^5 which engages with a dog n^6 on the spider W to release the treadle n^3 when the dog n^6 passes the lever n^5. When the treadle is depressed the lug n^{3*} on the treadle passes beneath the lug n^{7*} on the latch, allowing the latch to be pulled back by a spring O^1, and this causes the latch lug n^{7*} to come directly over the treadle lug n^{3*}, thereby holding the treadle down. When the latch is pulled back as described, it forces the rod n^4 up and raises the outer end of the lever n^5, depressing the inner end into position to be engaged by a dog n^6 on the spider W. The said dog rides under the said end of the lever n^5, and depresses the rod n^4 which throws down the latch and moves the lug n^{7*} from over the treadle lug n^{3*}, thereby allowing the treadle to rise and to catch the latch, so as to hold the latch after the dog n^6 has passed out from under the lever. Any desired means are provided on the ram block for securing the punch thereto, and the die may be secured to the frame of the machine in any desired manner, as by the usual block which is adjustably secured upon the frame.

In the operation of the press before described, the driving shaft is set in motion from any suitable source of power, and is kept continuously in motion so long as it is desired to use the press, it not being necessary to stop the shaft when a disk has been completely notched. The fly-wheel can be keyed fast to the shaft, which is a decided advantage over the usual construction in which the fly-wheel is connected and disconnected from the shaft each time it is desired to cease punching. The machine is provided with a separate ratchet disk for each different number of notches which it is desired to make in armature disks, and the

proper ratchet disk for any given armature disk is selected and secured to the ratchet spider. The proper length of stroke for the ratchet connecting rod F′ is obtained by adjusting the crank pin N′.

In order to adjust the machine, it is preferable to secure a "master" disk upon the disk spindle. The punch, is secured in the ram block, and the corresponding die is secured to its block, the two being properly adjusted and secured. By loosening the bolt y^3, the spindle bearing T can be raised or lowered in the slide Y, to bring the disk at the proper level for the dies. In thus raising or lowering the spindle bearing, it will be noted that all of the parts for operating the disk spindle are attached to and move with the spindle and spindle bearing, so that their adjustments are not in any manner disturbed. The slide Y is then prepared for adjustment toward or from the frame by slackening the bolt Z engaging its surface y^5, the set screw in the block B^2 and the clamp G′ upon the connecting rod F′. By turning the hand-wheel B′, the slide is then adjusted until the disk is brought into proper position relative to the dies. The parts which were loosened for adjustment of the slide are then tightened. The "master" disk is then adjusted radially to bring the key-way notch in proper relation to the teeth by means of the bolts y^4. The pawl is then set to throw the first notch a little farther than the desired final position, by adjusting the connecting rod F′. The connecting rod is roughly adjusted by means of the clamp collar G′, and is then delicately adjusted by revolving the eccentric stud e^3 in its bearing in the lever H′, the stud being clamped in adjusted position by means of the bolt L′. The locking lever is then adjusted until, when it engages the disk, it brings the notch exactly in line with the die. The result will be that the pawl will force the disk against the stress of the brake, forward, slightly beyond the desired position. The lock will then engage the bevel teeth of the ratchet disk and return the disk to be punched to exactly the desired position. The return movement of the disk is made without resistance from the brake, owing to the fact that the forward movement of the disk will throw the brake against the pin V′, while the slight return movement is not sufficient to throw such pin against the opposite wall of the slot in the disk. The effect is precisely the same as if the brake were released for the return movement. I am thus enabled to use a strong pressure of the brake to prevent overthrow by the pawl, such brake pressure being heavy enough so that a very high speed is feasible, and yet the lock is able to make the return movement without being subjected to any strain whatever by the brake. This is an arrangement which is exceedingly desirable, and which has enabled my press, in practice, to make the speeds very much higher than those of any other notching press with which I am familiar. The press, having been adjusted, the "master" disk is removed, and the disk to be punched is put in place. The treadle is then depressed and latched down. By means of the chains connecting the treadle with the lever K, such lever is thrown against the timing cam M, and is permitted by the said cam to throw in the ram clutch when the ratchet disk is locked in proper position, it being impossible to operate the clutch until the parts are in such position. The depression of the treadle also swings the lever T′, and allows the pawl to come against the ratchet disk. The ram is then depressed and punches a notch. While the ram is descending, the ratchet disk remains locked, and it cannot be moved until the ram has again risen to its upper or inoperative position. When the disk is unlocked, the pawl feeds it forward slightly beyond the desired position, as above described, such action taking place against the friction of the brake. As the ram begins to descend on the next stroke, the locking lever is thrown into position by the spring Y′ and returns the disk to exact register. When the dog on the spider strikes the treadle rod, the treadle is released and rises under the action of the spring N, thus releasing the ram clutch and also releasing the lever T′, permitting the spring S′ to thrust the rod P″ forward, and throw the pawl into inoperative position.

My notching press has the following advantages:—The clutch is exceedingly simple and durable. When the clutch pin F is turned to pass under the block g^3, the pitman, owing to the horizontal travel of the crank pin at that particular moment has no vertical movement, so that there is practically no blow when the engagement of the said pin and block takes place. As the ram block is adjustably connected with the ram, no adjustment of the clutch is needed when changes are made from a die of one height to that of another. The disengagement of the clutch always takes place at the top of the stroke of the ram, so that the ram is both positively depressed and positively elevated, the return motion being quicker and more certain than if it depended upon a spring. The function of the spring Q is simply to hold the ram in elevated position when the clutch is disconnected. The timing cam absolutely prevents punching, except at a time when the parts are ready for such operation. It is also true, however, that the operative can depress the treadle at any time he may desire, without observing the position of the parts. The indexing being performed by the

direct action of a pawl upon a ratchet disk, and without the intervention of gearing, is certain, and all errors which would be introduced by the interposition of gearing are eliminated.

I have found, in practice, that my press will punch disks so accurately that no finishing is necessary after they leave the press. The mounting of all the parts for driving the spindle disk upon such disk or its bearings avoids disturbing their adjustments when such spindle is adjusted vertically to suit dies of different heights. My press permits the accurate location of the notches of the armature disk with reference to the key-seat, or other holes or driving apertures in said disk.

It is obvious that various changes can be made in the above-illustrated construction, which will be within the scope of my invention, and I do not desire to be limited beyond the scope of my claims or the requirements of the prior art.

Having thus described my invention, what I claim is:—

1. In a press, the combination of means for operating dies, a disk, spindle, means for rotating said spindle step-by-step, a brake adapted to prevent overthrow, means for moving said spindle to exact position, and means for relieving said spindle from the action of said brake during said last-mentioned movement.

2. In a press, the combination of dies, a disk spindle, a pawl-and-ratchet feed for advancing said spindle, a brake to prevent overthrow, means for moving said spindle to exact position, and means whereby said brake is prevented from acting during said last-mentioned movement.

3. In a press, the combination of dies, a disk spindle, a pawl-and-ratchet feed for moving said spindle step-by-step, a brake adapted to prevent overthrow, and a stationary part engaging an opening in said brake, said opening being larger than the dimension of said part in the direction of rotation.

4. In a press, the combination of dies, a disk spindle, a pawl and ratchet adapted to move said spindle step-by-step to positions in advance of the exact positions desired, a brake adapted to prevent overthrow, means for returning said spindle to exact position, and a stationary part adapted to engage a shoulder on said brake, provision being made whereby said shoulder may retreat from said part.

5. In a press, the combination of dies, a disk spindle, a ratchet disk connected to said spindle, a pawl adapted to move said ratchet disk, a brake adapted to prevent overthrow, a stationary pin extending between shoulders on said brake, said shoulders being farther apart than the corresponding dimension of said pin, and a lock adapted to engage said ratchet disk, said lock being beveled and said ratchet disk having flaring openings adapted to receive said lock.

6. In a press, the combination of dies, a disk spindle, a ratchet disk connected thereto, a pawl adapted to engage said ratchet disk and capable of such movement as will carry such ratchet disk beyond the desired position, a brake consisting of semi-circular parts yieldingly pressed against the hub of said ratchet disk, said brake parts having opposing shoulders, a stationary pin extending between said shoulders, but smaller than the space between said shoulders, a beveled locking lever engaging flaring recesses in said ratchet disk, a spring for forcing said locking lever into locking position, and means for unlocking said locking lever when the dies are in inoperative position.

7. In a press, the combination of dies, a disk spindle, a ratchet disk mounted upon said spindle, a brake engaging the hub of said ratchet disk, a pawl adapted to engage said ratchet disk, means for loosely holding said brake from rotation, and a beveled locking part adapted to enter flaring recesses in said ratchet disk.

8. In a press, the combination of means for operating dies, a disk spindle, means for rotating said spindle step by step to a position approximating but not reaching exact position, a brake adapted to prevent overthrow, and means for moving said spindle to exact position.

9. In a press, the combination of a ram, a disk-spindle, a spindle-feed, a lock for said spindle, a spring tending to throw said lock into operative position, a lever connected with said lock, and a projection carried by said lever to release said lock when said ram is retracted.

10. In a press, the combination of punches, and operating devices therefor, a disk-spindle and means for rotating the latter, a bearing for said spindle that is adjustable to compensate for different heights of dies, and devices for rotating said spindle, said devices being attached to and movable with said spindle and its bearing.

11. In a press, the combination of punches, and operating devices therefor, a disk-spindle and means for rotating the latter, a bearing for said spindle that is adjustable to compensate for different heights of dies, and devices for rotating and locking said spindle, said devices being attached to and movable with said spindle and its bearing.

12. In a notching press, the combination of a frame, die-operating and supporting devices mounted upon said frame, a disk-spindle, and a slide for supporting said disk-spindle, said slide having a body extending into a

slideway in said frame, said slideway extending transverse to the line of movement of said dies.

13. In a notching press, the combination of a frame having die-operating parts mounted thereon, a disk-spindle, and a slide affording support for said disk-spindle, said slide having a substantially cylindrical body extending through a bore in the frame in a direction substantially transverse to the line of movement of said dies.

14. In a notching press, the combination of a frame having die-operating parts mounted thereon, a disk-spindle, a slide affording support for said disk-spindle, said slide having a substantially cylindrical body extending through a bore in the frame in a direction substantially transverse to the line of movement of said dies, and a screw-shaft journaled in said slide and threaded into said frame, said shaft serving to adjust said frame.

15. In a notching press, the combination of a frame having die-operating devices mounted thereon, a disk-spindle, a cylindrical bearing therefor, and screws mounted in the bearing support and engaging the shoulders on the bearing, whereby the bearing may be adjusted rotatively.

16. In a notching press, the combination of a frame having die-operating devices mounted thereon, a disk-spindle, a cylindrical bearing therefor, and screws mounted in the bearing support and engaging the shoulders on the bearing, whereby the bearing may be adjusted rotatively, said spindle bearing being vertically adjustable.

17. In a notching press, the combination of a frame having die-operating devices mounted thereon, a disk-spindle, a cylindrical bearing therefor, and screws mounted in the bearing support and engaging the shoulders on the bearing, whereby the bearing may be adjusted rotatively, said spindle bearing being vertically adjustable, said support for said spindle bearing consisting of a slide movable toward and from the line of movement of said dies.

18. In a notching press, the combination of a frame having die-operating devices mounted thereon, a disk-spindle, a cylindrical bearing therefor, and screws mounted in the bearing support and engaging the shoulders on the bearing, whereby the bearing may be adjusted rotatively, said spindle bearing being vertically adjustable, said support for said spindle bearing consisting of a slide movable toward and from the line of movement of said dies, said slide having a substantially cylindrical body that is received in a bore in said frame.

19. In a press, the combination of a driving shaft, die-operating mechanism, work-feeding mechanism, a clutch, by which motion is conveyed from the driving shaft to the dies, a treadle, connections between said treadle and said clutch, connections between said treadle and said work-feed, and a timing cam on said driving shaft to prevent the depression of said treadle, except during periods of rest of said work-feeding mechanism.

20. In a press, the combination of a driving shaft, die-operating mechanism, work-feeding mechanism, a clutch, by which motion is conveyed from the driving shaft to the dies, a treadle, connections between said treadle and said clutch, connections between said treadle and said work-feed, and a timing cam on said driving shaft to prevent the depression of said treadle, except during periods of rest of said work-feeding mechanism, said cam consisting of a substantially cylindrical body which is adapted to be engaged by a part connected with said clutch, said body having a depression which is adapted to permit said part to move when the work-feed is at rest.

21. In a press, the combination of a driving shaft, die-operating mechanism, work-feeding mechanism, a clutch, by which motion is conveyed from the driving shaft to the dies, a treadle, connections between said treadle and said clutch, connections between said treadle and said work-feed, and a timing cam on said driving shaft to prevent the depression of said treadle, except during periods of rest of said work-feeding mechanism, said cam consisting of a substantially cylindrical body which is adapted to be engaged by a part connected with said clutch, said body having a depression which is adapted to permit said part to move when the work-feed is at rest, said part consisting of a pivoted and laterally movable lever, and said depression having a spirally-inclined wall that is adapted to engage said lever, and move it laterally off said cam.

22. In a press, the combination of a driving shaft, a die-operating mechanism, work-feeding mechanism, a clutch, by which motion is conveyed from the driving shaft to the dies, a treadle, connections between said treadle and said clutch, connections between said treadle and said work-feed, and a timing cam on said driving shaft to prevent the depression of said treadle, except during periods of rest of said work-feeding mechanism, said cam consisting of a substantially cylindrical body which is adapted to be engaged by a part connected with said clutch, said body having a depression which is adapted to permit said part to move when the work-feed is at rest, said part consisting of a pivoted and laterally movable lever, and said depression having a spirally-inclined wall that is adapted to engage said lever and move it laterally off said cam, the non-operative portion of the periphery of said cam consisting of a groove

that is adapted to prevent lateral movement of said lever.

23. In a press, the combination of a ram, a pitman, a rotatable clutch pin journaled in one of said parts and passing through an opening in the other of said parts, a lug or block mounted in said opening, said pin being cut-away to permit the passage of said lug when said cut-away portion is in line therewith, and means for turning said pin to engage its periphery under said pin, to lock said pitman and ram together.

24. In a press, the combination of a ram, a pitman, a rotatable clutch pin journaled in one of said parts and passing through an opening in the other of said parts, a lug or block mounted in said opening, said pin being cut-away to permit the passage of said lug when said cut-away portion is in line therewith, and means for turning said pin to engage its periphery under said pin to lock said pitman and ram together, said means consisting of an arm on said pin, a spring tending to move said pin to inoperative position, and means to move said arm in opposition to said spring.

25. In a press, the combination of a ram, a pitman, a rotatable clutch pin journaled in one of said parts and passing through an opening in the other of said parts, a lug or block mounted in said opening, said pin being cut-away to permit the passage of said lug when said cut-away portion is in line therewith, and means for turning said pin to engage its periphery under said pin to lock said pitman and ram together, said means consisting of an arm on said pin, a spring tending to move said pin to inoperative position, and means to move said arm in opposition to said spring, said means comprising a rock-arm that is adapted to engage the side of said first-mentioned arm which is away from said spring.

26. In a press, the combination of a ram, a pitman, a rotatable clutch pin journaled in one of said parts and passing through an opening in the other of said parts, a lug or block mounted in said opening, said pin being cut-away to permit the passage of said lug when said cut-away portion is in line therewith, means for turning said pin to engage its periphery under said pin to lock said pitman and ram together, said means consisting of an arm on said pin, a spring tending to move said pin to inoperative position, means to move said arm in opposition to said spring, said means comprising a rock-arm that is adapted to engage the side of said first-mentioned arm which is away from said spring, and means for operating said rock-arm, said means comprising a lever and a timing cam to prevent the operation of said lever except when the driving shaft is in a predetermined position.

27. In a notching press, the combination of die-operating mechanism, a die-spindle, a pawl and ratchet feed for said die-spindle, a driving shaft, a clutch adapted to connect said driving shaft with said die-operating mechanism, a treadle having connections with such clutch, and a pawl throw-out consisting of a rod adapted to engage said pawl, said rod being longitudinally movable, a spring adapted to throw said rod toward said pawl, a lever adapted to move said rod in the opposite direction, and connections between said lever and said treadle.

28. In a notching press, the combination of die-operating mechanism, a disk-spindle, a ratchet-wheel for rotating said disk-spindle, a pawl for operating said ratchet-wheel, a reciprocating part connected with said die-operating mechanism, and a connecting rod for operating said pawl from said part, said connecting rod consisting of telescopic tubes, whereby the momentum of said rod is rendered slight, and a device for clamping said tubes.

29. In a notching press, the combination of die-operating mechanism, comprising a rotating shaft, a disk-spindle, a ratchet-wheel for rotating said spindle, a pawl for moving said ratchet-wheel, a crank on said shaft, said crank having a radially adjustable crank pin, a lever mounted on said frame, a connecting rod between said crank pin and one arm of said lever, a connecting rod between the other arm of said lever and said pawl, said last-mentioned connecting rod being secured to said lever by a crank pin having an eccentric stud, whereby the position of said pawl relative to said lever may be adjusted by rotating said stud.

30. In a notching press, the combination of die-operating mechanism, comprising a rotating shaft, a disk-spindle, a ratchet-wheel for rotating said spindle, a pawl for moving said ratchet-wheel, a crank on said shaft, said crank having a radially adjustable crank pin, a lever mounted on said frame, a connecting rod between said crank pin and one arm of said lever, a connecting rod between the other arm of said lever and said pawl, said last-mentioned connecting rod being secured to said lever by a crank pin having an eccentric stud, whereby the position of said pawl relative to said lever may be adjusted by rotating said stud, said crank being mounted in a split hole in said lever.

31. In a notching press, the combination of die-operating mechanism, comprising a rotating shaft, a disk-spindle, a ratchet-wheel for rotating said spindle, a pawl for moving said ratchet-wheel, a crank on said shaft, said crank having a radially adjustable crank pin, a lever mounted on said frame, a connecting rod between said crank pin and one arm of said pawl, said last-mentioned connecting rod being secured to said

lever by a crank pin having an eccentric stud, whereby the position of said pawl relative to said lever may be adjusted by rotating said stud, said crank being mounted in a split hole in said lever, said pin having a spherical surface that is engaged by said connecting rod.

In testimony that I claim the foregoing I have hereunto set my hand.

OBERLIN SMITH.

Witnesses:
HUGH L. REEVES,
HAROLD H. PAYNE.