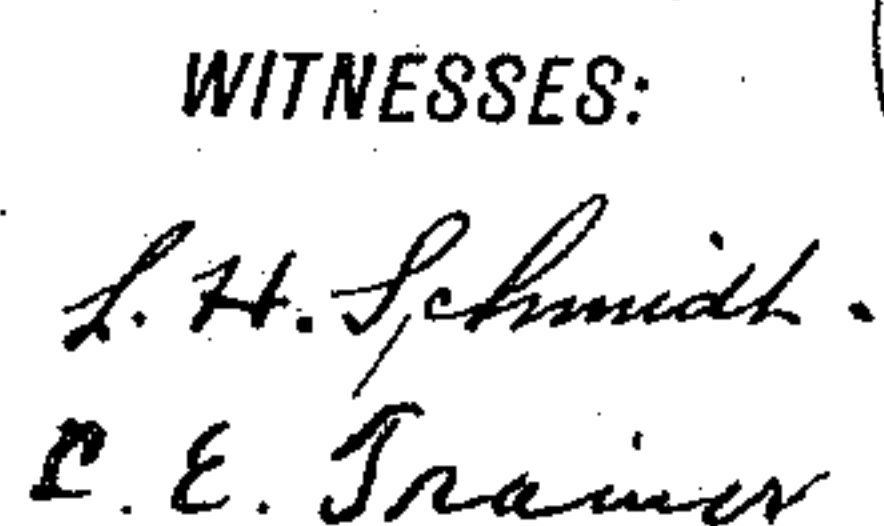




995,163.

2 SHEETS--SHEET 2.

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THE NORRIS PETERS CO., WASHINGTON, D. C.



# UNITED STATES PATENT OFFICE.

JORDAN F. LEAKE, OF KNOXVILLE, TENNESSEE.

## SHEARING-MACHINE.

Specification of Letters Patent. Patented June 13, 1911.

995,163.

Application filed August 31, 1910. Serial No. 579,889.

*To all whom it may concern:*

Be it known that I, JORDAN FRANCIS LEAKE, a citizen of the United States, and a resident of Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Shearing-Machines, of which the following is a specification.

My invention is an improvement in shearing machines, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide a simple and easily operated machine of the character specified, wherein the upper turret is moved angularly simultaneously with the lower turret, and is moved vertically with the ram toward and from the lower turret.

Referring to the drawings forming a part hereof Figure 1 is a side view of the improvement, Fig. 2 is a front view, and Fig. 3 is a bottom plan view of the upper turret.

The embodiment of the invention shown in the drawings comprises a body 1, having a throat 1<sup>a</sup>, in which are supported the elements of the improvement. A shaft 2 is journaled vertically in the body, and extending across the throat as shown, and the lower end of the shaft is provided with a bevel friction pinion 3. A horizontal shaft 4 is journaled below the body, and the shaft is provided with a pair of bevel friction pinions 5 and 6, one secured to the shaft on each side of the pinion 3. A lever 7 is provided with a pin 8 intermediate its ends, and the pin is received in a bearing 9 in the body. One end of the lever is provided with a grip 10, and the other end is bent angularly as shown at 11, and the extremity of the angular portion is provided with a bearing 12, for engaging the shaft 4. Collars 13 are arranged one on each side of the bearing 12, and each collar is held in place by a set screw 14. The shaft 4 is movable longitudinally in its bearings, and the pinions 5 and 6 are spaced apart from each other a distance greater than the diameter of the bevel pinion 3. The shaft 4 is rotated constantly by any suitable source of power.

It will be evident that by properly manipulating the lever 7, the pinion 3 may be engaged with either pinion 5 or 6, to rotate the shaft 2 in either direction, and by moving the shaft into the position shown in Fig. 1, with both pinions 5 and 6 out of engage-

ment with the pinion 3, the shaft 2 is permitted to stop.

A turret or disk 15 is supported on the shaft 2 in the throat 1<sup>a</sup> of the body, the said turret being keyed to the shaft by a key 17. The shaft is provided with a collar 18 above the body 1, and both the body and turret are recessed as indicated at 19 to receive the respective ends of the collar. The turret rests on the upper end of the collar.

The ram or hammer 20 of the machine is slidable in a bearing 21 in the head 22 of the body, and a lateral arm 23 extends inwardly, into the throat from the said ram. The arm 23 is provided with an opening for the shaft 2, and with lateral flanges 24 at one end, engaging the face of the ram, and cap screws 25 pass through the flanges and engage the ram to hold the arm in place.

An upper turret or disk 26 is supported on the arm, and is substantially the same diameter as the turret 15, and is arranged coaxially with the said turret. The turret 26 is held to the arm by an interlocking bearing comprising a hub 27 encircling the shaft 2, and provided at one end with a lateral annular flange 28 secured to the turret by cap screws 29. The hub is provided at the opposite end with a lateral flange 30 fitting a recess 31 in the lower face of the arm, and held in place by a ring 32 secured to the arm and engaging the flange. The ring 32 is provided with an inwardly extending flange overlying the flange 30 and the ring is secured to the arm in any suitable manner. The upper turret 26 is keyed to the shaft by a key 33, and the turrets are locked together from relative angular movement, by means of a key 34, passing through aligned openings in the turrets. The opening for the key 34 in the lower turret is close fitting, but loose enough to permit the upper turret to move with the ram 20, toward and from the lower turret. The key is held rigidly in the opening of the upper turret by a pair of keys 35, one on each side of the key 34. The ram 20 is moved vertically, and the arms 23 and upper turret 26 move with the said ram. Each of the turrets 15 and 26 is provided with a plurality of holders 36 for receiving a die 37, each holder comprising a notch or recess whose side walls are offset inwardly intermediate the upper and lower faces of the turret, and the dies are held in place by set screws 38, arranged in a vertical



opening 39 in the turret, and engaging the side of the die.

In operation, the turrets are rotated in the proper direction to bring the desired die 5 beneath the ram, by moving the lever 7, to bring one of the pinions 5 or 6 into engagement with the pinion 3, and when in position and the work in place, the ram is moved downward. As the ram moves downwardly, 10 the upper turret is moved into contact with the lower turret, and the dies are brought together to perform the desired operation on the work. The lower turret 15 is supported on the opposite side from the ram by a roller 40, journaled in a bracket 41 on the body, and the upper turret is supported at the corresponding point, by a similar roller 42, journaled in the arm. The rollers 40 and 42 are each provided with trunnions 43, and the trunnions of the upper roller rest in notches or recesses 44 in the under face of the arm 23. The arm is also recessed at 45 to receive the roller. An anvil 46 is arranged on the body, below the 25 lower turret in alinement with the ram. The anvil coöperates with the ram in causing the dies to perform the necessary operation on the work. The ram 20 is provided with the usual opening 47 for receiving the operating shaft, not shown, and the said 30 ram is operated in the usual manner. The body is provided with the usual opening 48, in register with a similar opening 49 of the anvil, for the passage of waste material. 35 The two disks or turrets move simultaneously, so that the corresponding members of each die or tool are always brought into exact register, and in exact position for the impact of the ram. The upper and lower 40 turrets are relieved from all strain from the said impact, and are in fact entirely independent of the ram, acting merely as a carrying means for the tools.

A lug 50 triangular in cross section is provided on the lower face of the upper turret, 45 and the said lug fits between a pair of similar lugs 51, on the upper face of the lower turret, when the turrets are superposed. The said lugs 51 form a notch in which the 50 lug 50 fits. It will be evident that should there be, through accident, any angular displacement of the turrets with respect to each other, the lug 50 will engage one of the lugs 51 and will prevent their contacting. 55 A locking device is provided for engaging the lower turret when the dies are in alinement with the ram and the anvil. The said device comprises a rod 52, mounted in bearings 53 on the body of the device, and slidable vertically in the said bearings. The 60 lower end of the rod is provided with a treadle 54 and the said rod is pressed upward by a spring 55. The lower face of the lower turret is provided with openings 56 65 for engagement by the upper end of the rod,

and the openings are so arranged, that when engaged by the rod, the dies 37 will be in alinement with the ram and the anvil. Each of the dies 37 is provided on its inner end with a lug 57, having a vertical opening 58. The turret is provided with a vertical opening adjacent to each die holder and in position to register with the opening 58 through the lug 57 when the die is in proper position in the holder, and a tapering or wedge shaped 7 key 59 is passed through the registering opening to prevent radial movement of the die outward. But one of the keys is shown, but it will be understood that all of the dies are so constructed and so held in place. A 8 further locking device is shown for preventing angular movement of the turrets with respect to each other, the said device comprising a journal pin 60, whose lower end is reduced as at 61, to engage an opening 62, 85 through the lower turret and a shoulder 63 is formed between the reduced portion and the main portion for engaging the upper face of the lower turret. The lower end of the reduced portion of the journal pin is 90 threaded and is engaged by a nut 64 below the lower turret for holding the journal pin in place. The upper end 65 of the journal pin is also reduced and is received in a bearing 66, which is movable vertically in an 95 opening 67 in the upper turret. When the upper turret moves toward the lower turret the bearing moves with the journal pin.

From an inspection of Fig. 2 it will be seen that the anvil 46 is removable from the 100 body, the lower face of the said anvil being provided with an undercut or dovetailed lug 68, which is received in a similarly shaped groove 69 in the body.

I claim:—

1. A machine of the character specified, comprising a body provided with a lateral throat, a shaft journaled vertically in the body and passing transversely of the throat, 110 a lower turret keyed to the shaft in the throat, a vertically movable ram slidable in the body, an arm secured to the ram and extending laterally into the throat, the arm having an opening for the shaft, an upper turret rotatably connected with the arm, the 115 turrets having alined vertical openings, and a key passing through the openings and keyed to the upper turret, each of said turrets having a plurality of means for supporting dies, said means being arranged in 120 annular form and in position to pass in succession beneath the ram, the body having an anvil in alinement with the ram, a continuously rotating horizontal shaft below the body, a plurality of bevel friction gears 125 keyed on the horizontal shaft in spaced relation, a bevel friction gear on the vertical shaft between the said gears, and means for moving the horizontal shaft longitudinally.
2. A machine of the character specified, 130



comprising a body provided with a lateral throat, a shaft journaled vertically in the body and passing transversely of the throat, a lower turret keyed to the shaft in the throat, a vertically movable ram slidable in the body, an arm secured to the ram and extending laterally into the throat, the arm having an opening for the shaft, an upper turret rotatably connected with the arm, the turrets having alined vertical openings, and a key passing through the openings and keyed to the upper turret, each of said turrets having a plurality of means for supporting dies, said means being arranged in annular form and in position to pass in succession beneath the ram, the body having an anvil in alinement with the ram, and means for rotating the vertical shaft in either direction.

3. A machine of the character specified, comprising a body provided with a lateral throat, a shaft journaled vertically in the body and passing transversely of the throat, a lower turret keyed to the shaft in the throat, a vertically movable ram slidable in the body, an arm secured to the ram and extending laterally into the throat, the arm having an opening for the shaft, an upper turret rotatably connected with the arm, the turrets having alined vertical openings, and a key passing through the openings and keyed to the upper turret, each of said turrets having a plurality of means for supporting dies, said means being arranged in annular form and in position to pass in succession beneath the ram, the body having an anvil in alinement with the ram.

4. A machine of the character specified, comprising a vertical shaft, a lower turret keyed to the shaft, a ram movable vertically toward and from the face of the turret at one side of the shaft, an arm secured to the ram and having an opening for the shaft, an upper turret keyed to the shaft and movable longitudinally thereof toward and from the lower turret, a rotatable connection between the arm and the turret for moving the turret with the arm, and a key passing through both turrets and keyed to the upper turret, each of said turrets having a plurality of die supporting means in position for engagement by the ram, and an anvil below the lower turret in alinement with the ram.

5. A machine of the character specified, comprising a vertical shaft, a lower turret keyed to the shaft, a ram movable vertically toward and from the face of the turret at one side of the shaft, an arm secured to the ram and having an opening for the shaft, an upper turret keyed to the shaft and movable longitudinally thereof toward and from the lower turret, a rotatable connection between the arm and the turret for moving the turret with the arm, means for constraining the turrets to rotate together, and an anvil

below the lower turret in alinement with the ram.

6. A machine of the character specified, comprising a vertical shaft, a lower turret keyed to the shaft, a ram movable vertically toward and from the face of the turret at one side of the shaft, an arm secured to the ram and having an opening for the shaft, an upper turret keyed to the shaft and movable longitudinally thereof toward and from the lower turret, a rotatable connection between the arm and the turret for moving the turret with the arm, and an anvil below the lower turret in alinement with the shaft.

7. A machine of the character specified, comprising a vertical shaft, a lower turret keyed thereto, an upper turret keyed to the shaft and movable longitudinally thereof, a ram movable toward and from the face of the upper turret near the edge thereof, an anvil below the lower turret in alinement with the ram, and a rotatable connection between the ram and the upper turret for constraining the turret to move with the ram, each of said turrets having an annular series of tool holding means in position for engagement by the anvil.

8. A machine of the character specified, comprising upper and lower turrets, means for simultaneously rotating the turrets, the upper turret being movable toward and from the lower turret, a ram movable toward and from the face of the upper turret near one edge thereof, an anvil below the lower turret in alinement with the ram, and a rotatable connection between the ram and the upper turret for constraining said turret to move vertically with the ram.

9. A machine of the character specified, comprising upper and lower turrets, means for simultaneously rotating the turrets, the upper turret being movable toward and from the lower turret, a journal pin having reduced ends, the turrets each having an opening for receiving one of said ends, a nut threaded on the pin below the lower turret, and a bearing in the opening of the upper turret for receiving the upper end of the said pin, said bearing being movable vertically in the turret.

10. In a machine of the character specified, a turret provided with radial die holding recesses, and dies for engaging the recesses, each of said dies having on its inner end a lug provided with a vertical opening, the turret having a vertical opening adapted to register with the opening of the lug when the die is in place, and a wedge shaped key passing through the registering opening to hold the dies in place.

11. A machine of the character specified, comprising upper and lower turrets, means for simultaneously rotating the turrets, the upper turret being movable toward and from the lower turret, a ram movable to-



ward and from the face of the upper turret near one edge thereof, an anvil below the lower turret in alinement with the ram, and means engaging the lower turret for locking said turret when a die is in alinement with the ram and anvil.

12. A machine of the character specified, comprising upper and lower turrets, means for simultaneously rotating the turrets, the upper turrets being movable toward and from the lower turret, a ram movable toward and from the face of the upper turret near one edge thereof, an anvil below the lower turret in alinement with the ram, means engaging the lower turret for locking said turret when a die is in alinement with the ram and anvil, said means comprising a rod movable toward and from the lower turret and provided with a treadle, and a spring normally pressing said rod toward the turret, the turret having openings for receiving the end of the rod.

13. A machine of the character specified, comprising upper and lower turrets, means for simultaneously rotating the turrets, the upper turret being movable toward and from the lower turret, a ram movable toward and from the face of the upper turret

near one edge thereof, and a rotatable connection between the ram and the upper turret.

14. In a machine of the character specified, a turret having a plurality of radial notches or recesses, the side walls of the said notches or recesses being offset laterally intermediate the faces of the turret, dies in the holders and fitting the side walls thereof, means for holding the dies in place, said means comprising lugs extending radially from the dies, the turret having radial openings for receiving the lugs and transverse openings intersecting the radial openings, and a pin in each of the transverse openings for holding the dies in place.

15. In a machine of the character specified, a turret having a plurality of radial notches or recesses, the side walls of the said notches or recesses being offset laterally intermediate the faces of the turret, dies in the holders and fitting the side walls thereof, and means for holding the dies in place.

JORDAN F. LEAKE.

Witnesses:

JOHN P. DE FORD,  
ALBERT H. BLACKBURN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."