B. F. RINDFLEISCH.

BLANK FEEDING MEANS FOR METAL WORKING MACHINES.

APPLICATION FILED APR. 4, 1917.

1,315,416. Patented Sept. 9, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

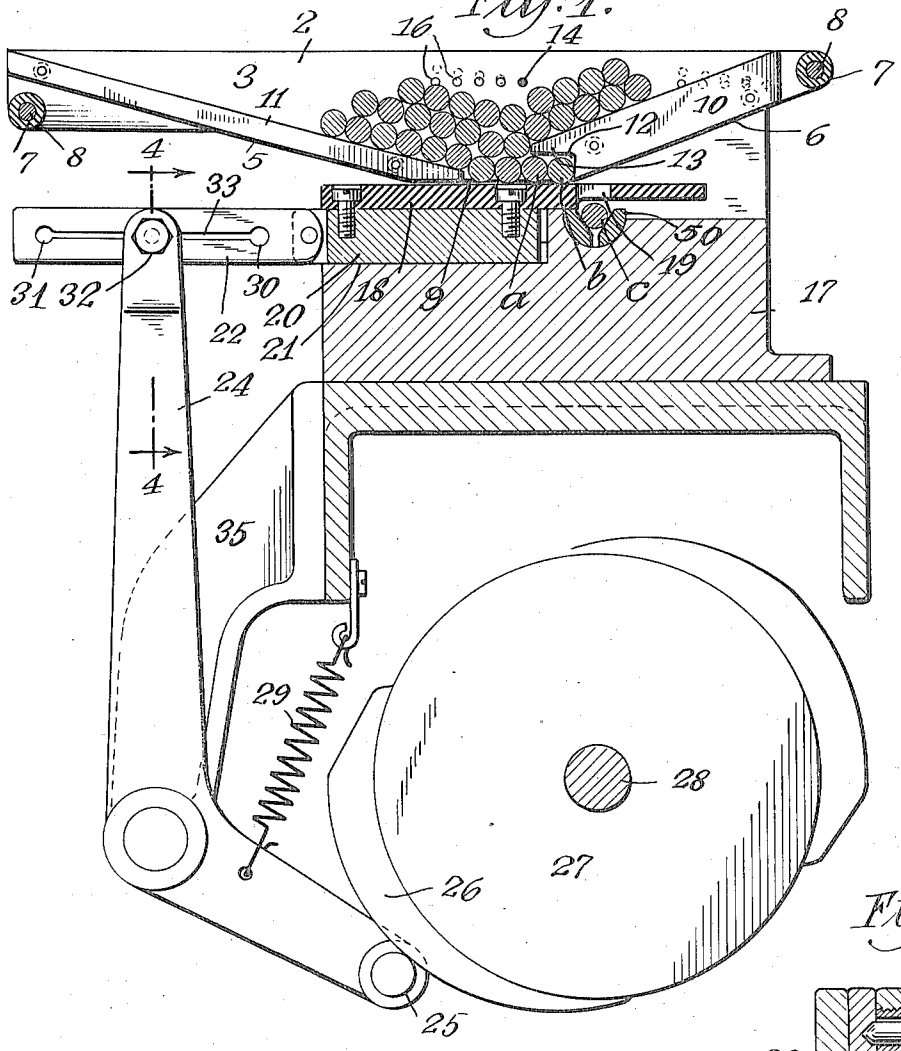


Fig. 4.

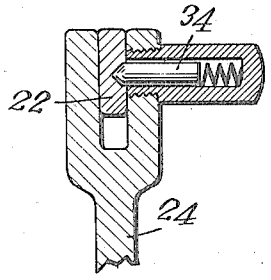
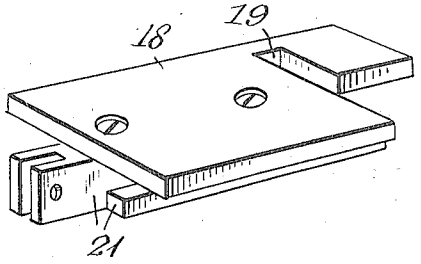


Fig. 3.



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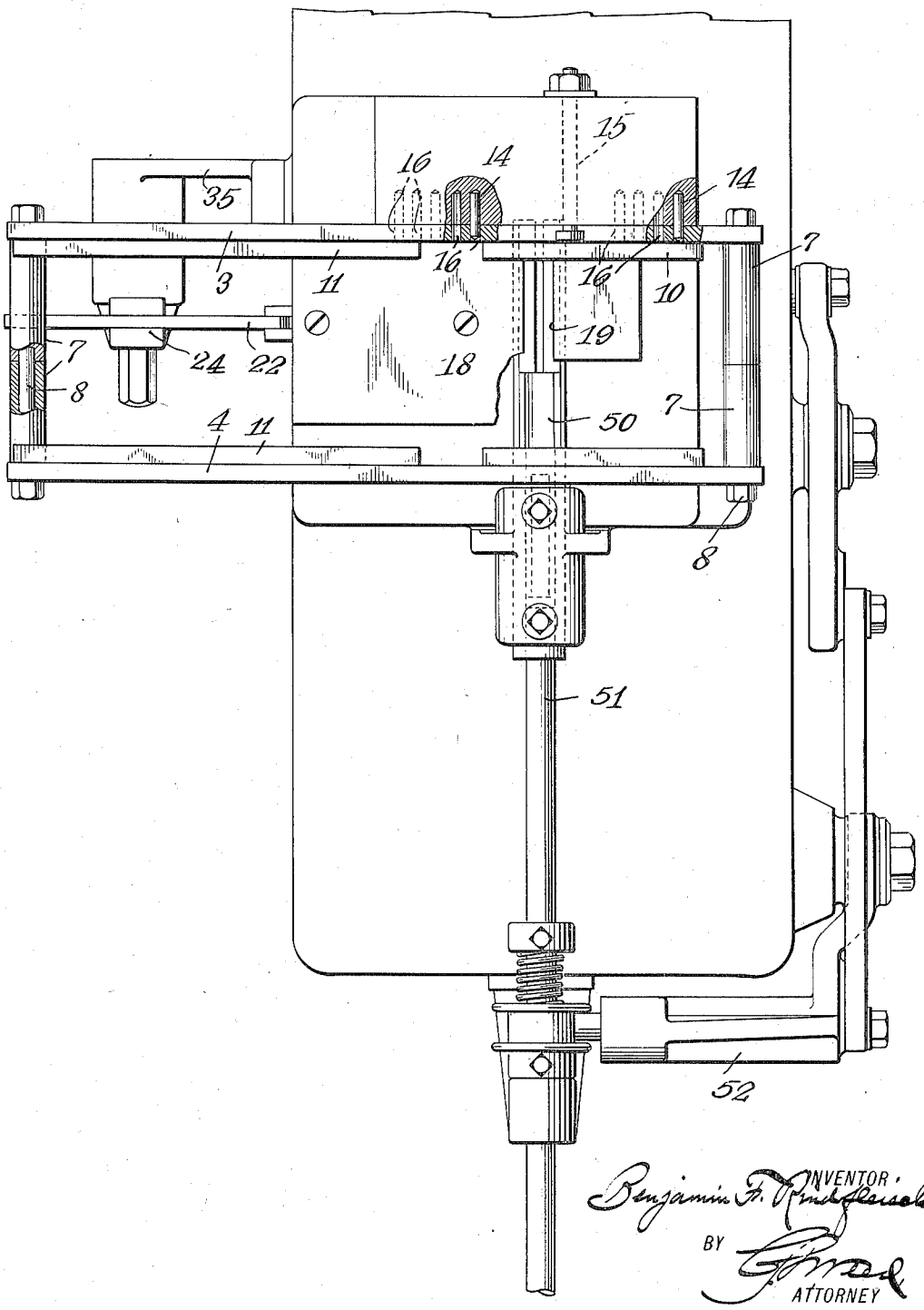
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. RINDFLEISCH, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL ACME COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BLANK-FEEDING MEANS FOR METAL-WORKING MACHINES.

1,315,416. Specification of Letters Patent. Patented Sept. 9, 1919.

Application filed April 4, 1917. Serial No. 159,607.

To all whom it may concern:

Be it known that I, BENJAMIN F. RINDFLEISCH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Blank-Feeding Means for Metal-Working Machines, of which the following is a specification.

This invention relates to metal working machines, more particularly to blank feeding means or magazines therefor, the object of the invention being to provide an improved blank feeding means or magazine for feeding blanks, such as round blanks like drills, taps, studs or other round pieces that have to be machined, one of the objects of the invention being to provide an improved magazine that will feed without clogging round blanks one at a time while permitting them to be piled in the hopper in bulk, one on top of another.

In the present improvement, a great number of blanks or pieces can be piled into the hopper and yet the weight thereof will not clog the feeding mechanism of the magazine, and will not interfere with the feeding of the blanks one at a time, since the magazine is so constructed that there is no pressure downward on the blank being fed from the other blanks or pieces in the hopper so that each blank is free to drop without any friction or cramping; and while the improvement is of a very simple character, nevertheless it obviates the difficulties which manufacturers,—particularly drill manufacturers,—have had in feeding drill blanks through automatic machines for milling. Many different schemes and devices have been gotten up for feeding blanks, but in all instances the blanks frequently clog the machine, largely due to the fact that where a hopper is used the blank to be fed is always under pressure due to the weight of the other blanks above it in the hopper. In the present improvement, however, this pressure on the blank to be fed is eliminated. In short, the weight of the blanks in the hopper is entirely removed from the blank to be fed, so that the feeding mechanism operates smoothly and effectively. In other words, in actual use, the present improvement has never failed to properly and smoothly operate.

In the present instance this improved magazine feeding means is applied to a stud threading machine similar to that shown and described in the contemporaneously pending application of Smith and Rindfleisch, Serial Number 161,723, filed April 13, 1917, and which application more particularly illustrates in detail the manner of attaching the magazine to the bed of the machine whereby it will be in position to properly coöperate with the threading die and the work carrying spindle or chuck.

In the drawings accompanying and forming a part of this specification, Figure 1 is an end or side view of this improved magazine feeding means, the bed of the machine being shown in section and the driving or cam shaft of the machine likewise shown in section; Fig. 2 is a plan view of this improved magazine feeding means and so much of a stud threading machine as it is necessary to illustrate in order to show the application of the improvement thereto; Fig. 3 is a perspective detail view of the blank slide; and Fig. 4 is a detail sectional view taken on line 4—4 Fig. 1 looking in the direction of the arrows.

Similar characters of reference indicate corresponding parts in the several figures of the drawings.

This improved magazine feeding means comprises in the preferred form thereof herein shown a blank receiving hopper 2 which in the present instance comprises a pair of side pieces or members 3 and 4, each having a pair of inclined lower edges 5 and 6. The sides 3 and 4 are spaced apart the required distance according to the length of the blanks and secured together at their ends by means of detachable bushings 7 and bolts 8. The distance these sides 3 and 4 are spaced apart can thus be varied by putting in different lengths of bushings so as to bring the sides closer together or spread them farther apart according to the length of the blanks to be fed. The inclined lower edges of these sides 3 and 4 terminate in a straight or flat bottom portion 9. Located between the sides and secured thereto are inclined guide pieces or rails 10 and 11, being secured to the sides at the same angle as the inclination of the bottom edges of the sides. The inclination of the bottom edges and of the rails 10 and 11 is not material so long as it is of sufficient angle to allow the blanks to roll toward the center from each end of the hopper. The inner lower ends of the rails 10 are recessed as at 12, the depth of these recesses being

sufficient to allow at least two blanks or pieces of the work to roll under the projecting portion 13 of the recesses. These recesses form a relief space so that when the magazine is filled or partly filled with blanks as shown in Fig. 1, the pressure of the blanks in the hopper will not be upon the two blanks *a* and *b* that are in this relief space. The magazine is fastened to the stud threading machine by means of pins 14 and a bolt 15 (see Fig. 2), the pins 14 projecting into holes 16 in one side of the hopper as the side 3, and by removing the pins and inserting them in different holes, the magazine may be adjusted vertically. Directly under the bottom or mouth of the magazine hopper is housed in a suitable recess formed in the top of the bed 17 of the machine, a slide plate 18 having a slot 19 therethrough sufficiently wide to allow a blank that is to be machined to drop into it and through it at the proper time. The underside of the magazine immediately under the relief space 12 is also provided with a slot of sufficient width to receive as many of the blanks as may be in the relief space 12. The slots 19 of the slide plate and in the bottom of the magazine, as well as the relief space 12 vary according to the size of the work to be fed. In other words, when a larger or smaller piece of work is to be fed than that shown, the slide plate is changed and the rails 10 are changed to accord with the size of blank that is to be fed. The slide plate 18 is secured to a sliding member 20 located in a guideway or recess 21 of the machine bed, and to this sliding member is pivotally secured a rearwardly extending lever or arm 22 to which is pivotally secured as at 32 a lever 24, the lower end of which is provided with a roll 25 in position to engage cams 26 carried by a cam drum 27 located on the shaft 28 of the machine, the roll 25 being held in engagement with the cam by a spring 29. In the lever 22, three stations or openings 30, 31 and 32 are machined and these stations are connected by a groove or slot 33. In Fig. 1 the stations are shown in the form of openings while the groove is shown in the form of a slot, while in Fig. 4 the stations are shown in the form of an opening which does not project through the member 22. Either form could be used so long as the opening shown at 30 is less than the largest diameter of the pointed end of the pin 34. In the present instance the upper end of the lever is shown connected to the lever 22 at the central station 32 by means of a housed spring pressed plunger or pin 34 (see Fig. 4) carried by the upper end of the lever 24. The lever 24 is pivoted to a suitable bracket 35 of the machine. When the cam on the cam drum 27 shifts the lever so as to move the slide to the right, the spring 29 will of course return the slide to the left when the cam 26 has left the roll 25.

In Fig. 1 the lever actuated slide 18 is shown in its forward or right hand position, a blank *c* having been deposited thereby into the bore of the work spindle 50, into which it drops freely from the slot 19 of the slide without any interference or pressure from any of the other pieces that are in the magazine. On the return of the slide rearwardly or to the left either one of the pieces or blanks *a* or *b* that is in the release space 12 of the hopper is free to drop into the slot 19 of the slide as the slide passes rearwardly or to its initial position, so that as the slide moves forward or to the right the blank, which is dropped into the slot 19, will drop therefrom into the work spindle in readiness to be shifted forward to be threaded.

The purpose of the three stations, 30, 31 and 32 hereinbefore referred to is to prevent the breakage of any part of the operating means in case of accident. If for some unforeseen reason one of the blanks clogs or drops partly into the slot 19 of the slide 18 with a part thereof still remaining in the magazine hopper, the extra strain forces the plunger 34 of the lever 24 out of the middle station or operating station and allows it to slide forward to the station 30, thus eliminating breakage of the lever 34, and if after the slide has traveled through its loading position where it carries the piece of work to the spindle and becomes clogged on its return movement, the lever would slip out of the center station and pass over into the outer or end station 31, thus again preventing breakage of the parts.

From the foregoing it will be observed that in the present improvement the blanks are received successively from a receiving or pressure relieving space of the hopper by the slide on its movement to the left or rearwardly and then fed forward and deposited in the work spindle as the slide moves to the right, so that the blanks are received by the slide without being cramped or held under pressure due to the weight of the other blanks in the hopper, so that they are free to drop into the slot of the slide and free to drop therefrom into the work spindle without any friction or cramping, and be gripped by suitable gripping mechanism.

The blank carrying or work spindle 50 is usually provided with a rod 51 and suitable feeding mechanism 52 for pushing forward the blank after it is dropped into the work spindle into position to be threaded by a suitable threading die, all of which parts are more clearly shown in detail in the application hereinbefore referred to, and therefore it is deemed unnecessary to show or describe the same more fully herein.

I claim as my invention:

1. In a blank feeding means, the combination of a blank receiving hopper provided with a relief space for a blank or blanks

to relieve the same from the weight of all other blanks, said relief space being open at its bottom, and shiftable means for closing said bottom and shiftable to permit blanks to drop from said relief space.

2. In a blank feeding means, the combination of a blank receiving hopper provided with a relief space for a blank or blanks to relieve the same from the weight of all other blanks, said relief space being open at its bottom, and shiftable means for closing said bottom and shiftable to permit blanks to drop from said relief space, said shiftable means constructed to receive and feed the blanks from such relief space.

3. In a blank feeding means, the combination of a blank receiving hopper provided with a relief space for a blank or blanks to relieve the same from the weight of all other blanks, said relief space being open at its bottom, and shiftable means for closing said bottom and shiftable to permit blanks to drop from said relief space, said shiftable means constructed to receive and feed the blanks from such relief space and comprising a slide having a slot for the reception of only one blank at a time from the relief space.

4. In a metal working machine the combination of a work spindle having an opening in the top side thereof, a blank receiving hopper having a relief space, a slide shiftable above the work spindle and below the relief space and adapted to receive a blank from the relief space of the hopper and discharge the same into the work spindle, and means for operating the slide.

5. In a metal working machine the combination of a work spindle having an opening in the top side thereof, a blank receiving hopper having a relief space, a slide shiftable above the work spindle and below the relief space and adapted to receive a blank from the relief space of the hopper and discharge the same into the work spindle, and means for operating the slide comprising a cam and a lever, the latter releasably connected with the slide.

6. A blank magazine feeding means comprising a hopper, a slide for receiving and delivering a blank therefrom, and means for operating the slide and including a lever slidingly connected to the slide and automatically shiftable from one position thereon to another in the event of extra strain on the operating parts thereby to prevent breakage thereof.

7. A blank magazine feeding means comprising a hopper, a slide for receiving and discharging a blank therefrom and having a plurality of stations means for shifting the slide and comprising a lever, and a spring actuated pin for releasably connecting the lever with any one of several stations of the slide.

8. A magazine feeding means comprising a hopper, a slide and means for operating the slide and including a lever, and means for connecting the lever to the slide, said lever being automatically shiftable from one position to another relatively to said slide in the event of extra strain on the operating parts thereby to prevent breakage thereof.

9. A magazine feeding means comprising a hopper, a slide and means for operating the slide and including a lever, and means for releasably connecting the lever in different positions of the slide and comprising a spring actuated pin carried by the lever and a plurality of groove connected openings carried by the slide.

10. A magazine feeding means comprising a hopper, a slide for receiving and discharging blanks therefrom, and means for shifting the slide and including a lever, said last two elements having one a plurality of groove connected openings and the other a spring-pressed pin for connecting the lever with any one of said openings.

11. In a metal working machine the combination of a stock or work carrying spindle having an opening in the top side thereof, a hopper located thereabove and having a relieved portion for the reception of one or more blanks, a slide working between the relief portion and the work spindle and having a slot for the reception of a blank, and means for operating the slide and having a releasable connection therewith.

12. A blank feeding magazine comprising a hopper consisting of a pair of adjustable sides to vary the width of the hopper, and means for receiving and feeding a blank therefrom, said hopper having a relieved space for the reception of a blank to be fed, the length of the relieved space being varied by adjusting the sides.

13. A blank feeding magazine comprising a hopper consisting of a pair of adjustable sides to vary the width of the hopper, and means for receiving and feeding a blank therefrom, said hopper sides having inclined guide members provided with a relieved space for the reception of a blank to be fed and said feeding means including a slide having a slot for the reception of the blank to be fed, the length of the relieved space being varied by adjusting the sides.

14. A magazine comprising a hopper having inclined blank carrying means, the inclined blank carrying means at one side having a projection forming thereunder a blank receiving space for a predetermined number of blanks, said projection receiving the weight of the blanks in the hopper and relieving the blanks in said space from such weight.

15. A magazine comprising a hopper having removable inclined blank carrying

means, the inclined blank carrying means at one side having a blank receiving space for a predetermined number of blanks, said last inclined blank carrying means being removable to permit the substitution of a blank carrying means adapted to receive a different size of blank in said receiving space.

16. In a metal working machine, the combination of a hopper having detachable means provided with a blank relieving space open at its bottom to permit blanks to drop therefrom, a detachable slide for closing said space at its bottom and having a slot for the passage therethrough of a blank, a detachable work spindle for receiving blanks dropping through the slot of the slide, and means for shifting the slide.

17. In a metal working machine, the combination of a hopper having a detachable means provided with a blank relieving space open at its bottom to permit blanks to drop therefrom, a detachable slide for closing said space at its bottom and having a slot for the passage therethrough of a blank, a detachable work spindle for receiving blanks dropping through the slot of the slide, and means for shifting the slide, the blank receiving portions of said three detachable parts corresponding for one size of blank and the detachability of said three parts permitting the substitution of other similar parts constructed however to receive a different size of blank.

18. Blank feeding means for a metal working machine comprising means for receiving a number of blanks and means for relieving one or more blanks while in the blank receiving means from the weight of all companion blanks, the pressure of companion blanks, without the intervention of any shiftable mechanism, alone serving to shift said relieved blanks into that position where the weight of such companion blanks in the blank receiving means will be removed therefrom, and means for delivering a blank from which the weight has been relieved.

19. Blank feeding means for a metal working machine comprising means for receiving a number of blanks and means for relieving one or more blanks while in the blank receiving means from the weight of all companion blanks, the pressure of companion blanks, without the intervention of any shiftable mechanism, alone serving to shift said relieved blanks into that position where the weight of such companion blanks in the blank receiving means will be removed therefrom, and means for delivering a blank from which the weight has been relieved and comprising a slide and means for actuating it.

20. Blank feeding means for a metal working machine comprising a hopper adapted to receive a number of blanks and having an open bottom terminating at one side thereof in a relief space for a blank or blanks which while in said space will be relieved from the weight of all other blanks, a bed below said bottom and having means for receiving a blank from said relief space, and shiftable means located between said bed and the bottom of said hopper and relief space for closing the same and operative to open the bottom of the relief space thereby to permit a blank to be fed therefrom into the receiving means of the bed.

21. Blank feeding means for a metal working machine comprising a hopper adapted to receive a number of blanks and having an open bottom terminating at one side thereof in a relief space for a blank or blanks which while in said space will be relieved from the weight of all other blanks, a bed below said bottom and having means for receiving a blank from said relief space, and shiftable means located between said bed and the bottom of said hopper and relief space for closing the same and operative to open the bottom of the relief space thereby to permit a blank to be fed therefrom into the receiving means of the bed, said shiftable means comprising a slide having a slot therein for the passage therethrough of a blank from the relief space to said bed receiving means.

22. Blank feeding means for a metal working machine comprising an adjustable hopper adapted to receive a number of blanks and having an open bottom terminating at one side thereof in a relief space for a blank or blanks which while in said space will be relieved from the weight of all other blanks, a bed below said hopper, shiftable means located between said bed and the bottom of said hopper and relief space for closing the same and operative to open the bottom of the relief space thereby to permit a blank to be fed therefrom, and means for adjusting said hopper vertically relatively to the bed.

23. Blank feeding means for a metal working machine comprising blank receiving means adapted to hold a number of blanks, said receiving means having means for relieving the pressure on one or more blanks while in such receiving means, a work spindle having an opening in the top side thereof, and means for delivering a blank from which the pressure has been relieved from the receiving means to the work spindle.

24. Blank feeding means for a metal working machine comprising blank receiving means adapted to hold a number of blanks, said receiving means having means for relieving the pressure on one or more blanks while in such receiving means, a work spindle having an opening in the top side thereof, and means for delivering a

blank from which the pressure has been relieved from the receiving means to the work spindle and comprising a slide.

25. Blank feeding means for a metal working machine comprising blank receiving means adapted to hold a number of blanks, said receiving means having means for relieving the pressure on one or more blanks while in such receiving means, a work spindle having an opening in the top side thereof, and means for delivering a blank from which the pressure has been relieved from the receiving means to the work spindle and comprising a slide having a slot therein conforming to the size of the blank to be delivered.

26. Blank feeding means for a metal working machine comprising blank receiving means adapted to hold a number of blanks, said receiving means having means for relieving the pressure on one or more blanks while in such receiving means, a work spindle having an opening in the top side thereof, and means for delivering a blank from which the pressure has been relieved from the receiving means to the work spindle and comprising a slide having a slot therein conforming to the size of the blank to be delivered and effective to receive a blank from the receiving means on the movement of the slide in one direction and to discharge it into the work spindle on the movement of the slide in the opposite direction.

27. Blank feeding means for a metal working machine comprising blank receiving means adapted to hold a number of blanks, said receiving means having means for relieving the pressure on one or more blanks while in such receiving means, a work spindle having an opening in the top side thereof, means for delivering a blank from which the pressure has been relieved from the receiving means to the work spindle and comprising a slide having a slot therein conforming to the size of the blank to be delivered and effective to receive a blank from the receiving means on the movement of the slide in one direction and to discharge it into the work spindle on the movement of the slide in the opposite direction, and means for operating the slide and releasably connected therewith to permit such connection to be varied should a blank become clogged.

28. A magazine comprising a blank receiving hopper having opposed inclined blank supporting means spaced at their lower ends to form a passageway for the blanks, the lower end of one inclined means having a recess extending to the rearward of its forward edge thereby forming a projection and a relief space thereunder for a blank, the said projection being effective to relieve a blank or blanks in said space from the weight of the blanks thereabove.

29. In a metal working machine, the combination of a work spindle having an opening in the top side thereof, a blank receiving hopper located thereabove and comprising opposed inclined blank supporting means spaced at their lower ends to form a passageway for the blanks, the lower end of one inclined means being higher than the other and having a recess extending to the rearward of its forward edge thereby forming a projection and a relief space thereunder for a blank or blanks, the said forward edge being effective to relieve a blank or blanks in said space from the weight of the blanks thereabove, a slide shiftable above the work spindle and below said passageway and relief space and adapted to receive a blank from the relief space of the hopper and discharge the same into the work spindle, and means for operating said slide.

30. Blank feeding means for a metal working machine comprising an adjustable hopper adapted to receive a number of blanks and having an open bottom terminating at one side thereof in a relief space for a blank or blanks which while in said space will be relieved from the weight of all other blanks, a bed below said hopper, shiftable means located between said bed and the bottom of said hopper and relief space for closing the same and operative to open the bottom of the relief space thereby to permit a blank to be fed therefrom, and means for adjusting said hopper vertically relatively to the bed and comprising insertible pins and a plurality of differently positioned holes, the pins and holes being carried one by the bed and the other by the magazine.

31. Blank feeding means for a metal working machine comprising a blank receiving means constructed to guide the blanks toward a common point, said blank receiving means having adjacent to said common point a blank receiving space for the reception of a blank or blanks, which when in said space is still in contact with a companion blank but relieved from the weight of all companion blanks, the pressure of the blanks in said receiving means alone forcing a blank or blanks into said relief space.

Signed at Cleveland, Ohio, this 29th day of March, one thousand nine hundred seventeen.

BENJAMIN F. RINDFLEISCH.

Witnesses:
L. E. HONEYWELL,
E. O. WOOLGAR.