

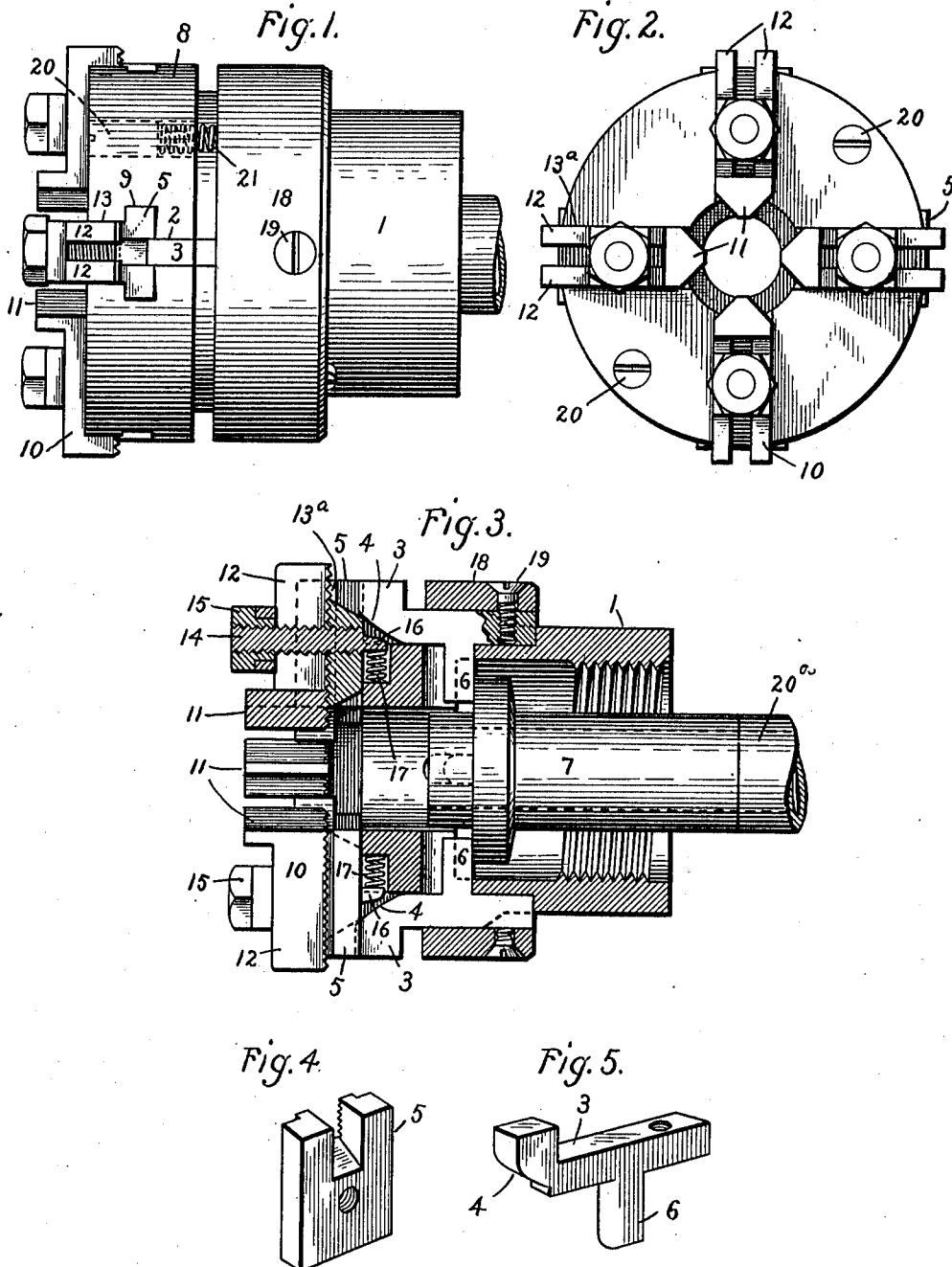
A. NIEDHAMMER.

CHUCK.

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988,376.

Patented Apr. 4, 1911.



Witnesses
J. Ellis Allen.
J. Earl Ryan

Inventor.
Adam Niedhammer,
By Alex. F. MacDonald
att'y.

UNITED STATES PATENT OFFICE.

ADAM NIEDHAMMER, OF SCHENECTADY, NEW YORK.

CHUCK.

988,376.

Specification of Letters Patent.

Patented Apr. 4, 1911.

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To all whom it may concern:

Be it known that I, ADAM NIEDHAMMER, a citizen of the United States, residing in Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Chucks, of which the following is a specification.

The present invention relates to chucks, and more especially to those used on screw-machines.

The object of my invention is to provide a chuck of improved construction, which is capable of gripping and securely holding stock of widely varying diameters and cross-sections.

In the accompanying drawing, which is illustrative of one of the embodiments of my invention, Figure 1 is a view in side elevation of the chuck; Fig. 2 is a face view thereof; Fig. 3 is an axial section of the same; Fig. 4 is a perspective view of one of the sliding blocks which carries a jaw; and Fig. 5 is a perspective view of one of the actuators.

1 indicates a tubular holder or body having an internal screw-thread on one end by means of which it can be secured to the hollow rotating spindle of a screw- or other machine. The periphery of the holder or body is provided with as many longitudinal grooves 2 as there are jaws. Four are shown in the present instance, but the number can be changed to suit the requirements. In each of the grooves is located an actuator 3. Each actuator is provided with a beveled or cam face 4 that is adapted when moved longitudinally to the left to engage the beveled or cam face located at the bottom of a slot in the radially sliding block 5. Each actuator is also provided with a radial projection 6 on its under side with which the tubular member 7 engages when it is desired to cause the jaws to grip the stock.

The holder or body is provided with an enlarged head 8, and formed therein are radial slots 9 that are or may be rectangular in form. In each of these slots is located one of the sliding blocks 5. The slots are made rectangular in order that the walls thereof may prevent the sliding blocks from turning, and also to provide ample bearing surfaces therefor. Each block has a roughened front face to receive and support an adjustable jaw 10. Each jaw comprises a portion 11 arranged to engage the stock that is to be machined, and two side portions

12 that engage with and slide on the side faces 13 of the slots 13^a in the head. It is to be noted that each jaw engages the walls of the radial grooves and in this manner the sliding blocks are relieved of considerable strain. They are also made narrower than the blocks to enable the latter to be guided not only on the rear and edges but on the front face as well. This makes for strength and rigidity and withal is an exceedingly simple arrangement. These jaws are or may be hardened to prevent wear. Each jaw is adjustable so that the chuck can be used for stock of various kinds and of different size and shape. They are secured to the sliding blocks 5 by stud bolts 14 and nuts 15. Each bolt may be extended beyond the rear face of its block, as at 16, to form an abutment for the radially disposed compression spring 17. There are as many of these springs as there are jaws, and they tend at all times to force the jaws outwardly. I have shown the inner ends of the bolts 14 as threaded into the sliding blocks, but they may be otherwise secured. The main thing is to securely fasten them in place and prevent their turning with the nuts. Owing to the fact that the sliding blocks make a snug fit in the radial slots in the head, and also to the fact that the side portions of the U-shaped jaws make a sliding fit with the walls of the slots 13^a, said jaws are prevented from turning or accidentally yielding in any way. By making the jaws separate from the blocks, the same chuck may be used for a variety of purposes, special or otherwise, by merely adjusting the jaws or substituting others of different shape.

The actuators 3, as before stated, are moved axially by the tubular member 7. To insure simultaneous and corresponding lengths of travel, they are connected by a ring 18, the latter being united with the actuators by screws 19. It will be noted that each actuator is T-shaped, and made of a single detachable piece. This means that they can be made exactly alike, and are therefore interchangeable. One end of the T engages the sliding block, the other is attached to the sliding ring, while the body or portion 6 is engaged by the annular flange of the tubular member 7. Since the said member is of less diameter than the body of the chucks as a whole can readily be mounted in place or removed. Between the ring and suitable adjustable abutments such as

the screws 20 are compression springs 21, two being provided in the present embodiment of the invention. These springs serve at all times to force the ring to the right and away from the head 8, and hence to seat the right ends of the actuators in the ends of the grooves. By arranging these springs as shown, they are out of the way, are readily adjusted as to tension, and new springs can readily be substituted if desired.

From the description it will be seen that so long as pressure is exerted on the radial projections 6 by the member 7, the jaws of the chuck will engage the work, but as soon as they are relieved of this pressure, the springs 21 and 17 will force the ring 18 and actuators 3 back to their initial positions. The springs 17 also force the sliding blocks 5 and the jaws outwardly away from the stock. This arrangement is of great benefit in a screw-machine, since it permits of the rapid manipulation of the stock between successive operations.

In order to force the tubular member 7 against the projections on the actuators, a hollow rotating sleeve 20^a is provided that passes through the head-stock of the machine to a point outside where it may be moved longitudinally under the control of a hand lever and clutch or other means of any suitable character. The particular structure of the means for moving the member 7 is immaterial so long as it is capable of rotating with the said member and the chuck and can furnish the necessary axial pressure to insure the jaws properly gripping the stock to be machined. In the case of a screw-machine, the sleeve 20^a, in addition to moving the member 7, should be capable of permitting the stock to be machined to be fed through it. It is preferable to make the springs 21 strong enough to move the actuators, the member 7 and sleeve 20^a when end pressure is removed from the latter.

My improved chuck has the advantage that it can be used without change for stock that differs materially in diameter. At present screw machines are commonly fitted with split jaw chucks, and if the stock varies over about one thirty-second of an inch in diameter it is necessary to use a different chuck. As a result a large number of chucks have to be kept on hand which, in addition to the initial cost, means that a certain amount of time must be consumed in changing them. There is also a certain amount of wear and liability to injury in making the change.

By simply changing the positions of the jaws, the range of usefulness of my chuck can be largely increased. I may substitute for the jaws shown those of special construction to hold irregular or peculiarly formed pieces of stock. These will not in any way require the modification of other

parts of the chuck. And since the chuck is quick and positive in its action the loss of time between successive machine operations is reduced to a minimum. I may also adjust one or more of the jaws so that it or they will be at a greater or less distance from the axis than the remainder.

The parts employed in the construction are of a simple nature, easy to manufacture and not liable to injury. Owing to the particular arrangement specified, the parts can be readily assembled and taken down. By actuating the jaws through internally situated means, the exterior of the chuck is free from all parts that might interfere with the operation thereof.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out within the scope of the appended claims by other means.

What I claim as new and desire to secure by Letters Patent of the United States is,

1. In a chuck, the combination of a body having peripheral axially extending grooves and radial slots, the latter opening into the former, longitudinally movable actuators located in said grooves, each having a cam face at one end, blocks slidably mounted in the slots which are moved radially by the actuators, each block having a cam face co-operating with that of an actuator, jaws carried by the blocks for gripping the stock which are guided by the walls of the slots, a loose tubular means concentric with the axis of the body and located within it which engages the several actuators, and through which the stock to be machined may be fed, and means for causing the jaws to release the stock.

2. In a chuck, the combination of a body having peripheral grooves and radial slots, actuators located in the grooves, each of which is provided with an internal radial projection, a ring surrounding the body and connecting the actuators to insure simultaneous movements, blocks slidably mounted in the slots which are moved by the actuators, jaws carried by the blocks, reciprocating means located within the body, one end of which engages the radial projections for moving the actuators longitudinally, and through which the stock to be machined is fed, and springs that oppose the means which move the actuators.

3. In a chuck, the combination of a tubular body having peripheral grooves, an internal screw thread for securing it to a driving spindle and radial slots, individual counterpart actuators mounted in the grooves that have internal radial projections, slid-

ing blocks that are mounted in the slots and are moved by the actuators, coöperating cam faces formed on the actuators and blocks, jaws carried by the blocks that engage the walls of the slots and are guided thereby, an axially moving tubular member located within the bore of the body and concentric with the axis of the chuck which engages the projections on the actuators and moves them, and a radially disposed spring acting on each of the jaws that tend at all times to move it and its coöperating actuator against the action of the tubular member and release the stock.

4. In a chuck, the combination of a tubular body having longitudinal peripheral grooves and radial slots, the latter opening into the former, sliding actuators mounted in the grooves that have cam faces at one end, sliding blocks located in the slots each of which has a slotted end and a cam face at the bottom of the slot that coöperates with a cam face on an actuator, a spring for each block that tends to move it outwardly, an adjustable jaw carried by each block which is narrower than the block and is guided by the walls of one of the radial slots, a ring that slides along the peripheral surface of the body and connects the actuators and insures simultaneous and equal travel thereof,

and means located within the body for moving the ring on the outside of the body and the actuators in the peripheral grooves to cause the jaws to act.

5. In a chuck, the combination of a main tubular body having equidistant longitudinal and radial slots, each of the said longitudinal slots opening into a radial slot, a sliding block mounted in each of the radial slots, a ring mounted to slide on the periphery of the body, T-shaped actuators whose heads are mounted in the longitudinal slots, one end of each head engaging a block, the other being attached to the ring, and the body portion extending radially inward through an opening in said main body, a flanged tubular member loosely mounted in said main body and engaging the body portions of all of the T-shaped actuators for moving them in one direction to grip the work, and spring means for moving the actuators longitudinally and in opposition to said member to free the work.

In witness whereof I have hereunto set my hand this 27th day of September, 1909.

ADAM NIEDHAMMER.

Witnesses:

EDWARD WILLIAMS,
ALEX. F. MACDONALD.