

(Model.)

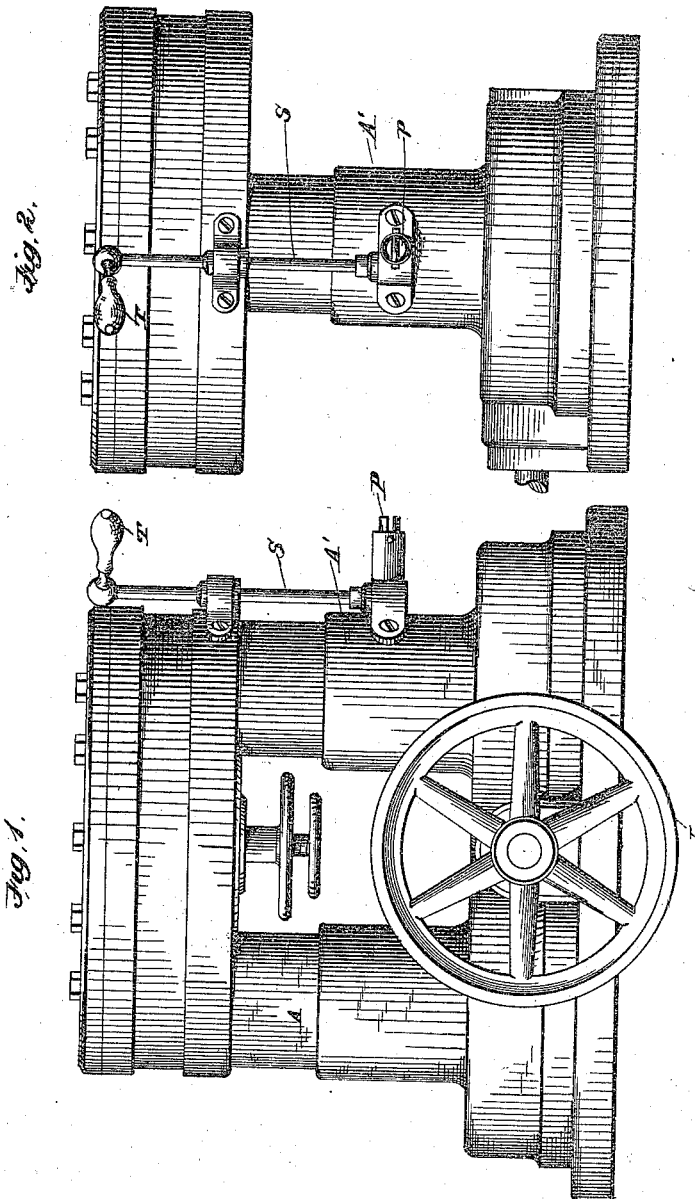
3 Sheets—Sheet 1.

W. KRUTZSCH.

BAND COMPRESSING MACHINE.

No. 265,679.

Patented Oct. 10, 1882.



WITNESSES:

*W. H. H. Knight*  
*Heinrich Schindler*

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his Attorneys

(Model.)

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Fig. 3.

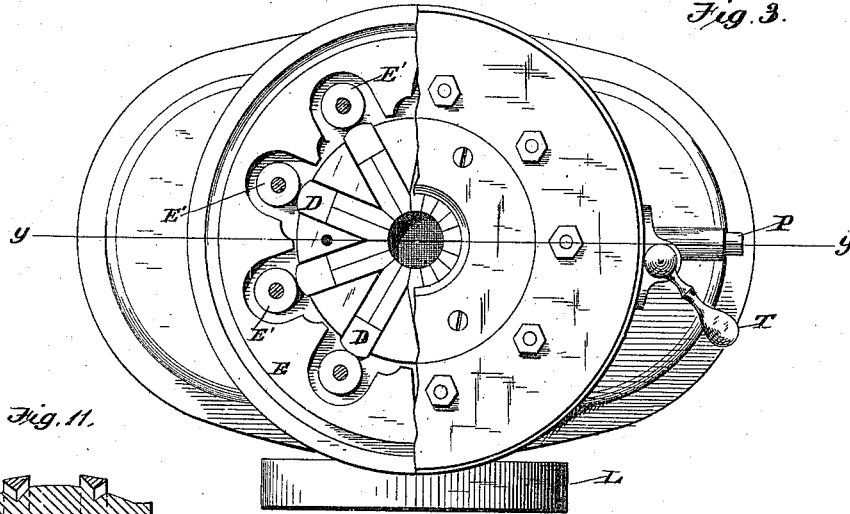


Fig. 11.

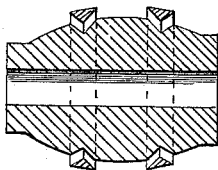


Fig. 12.

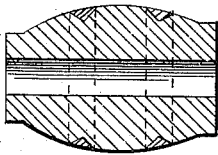
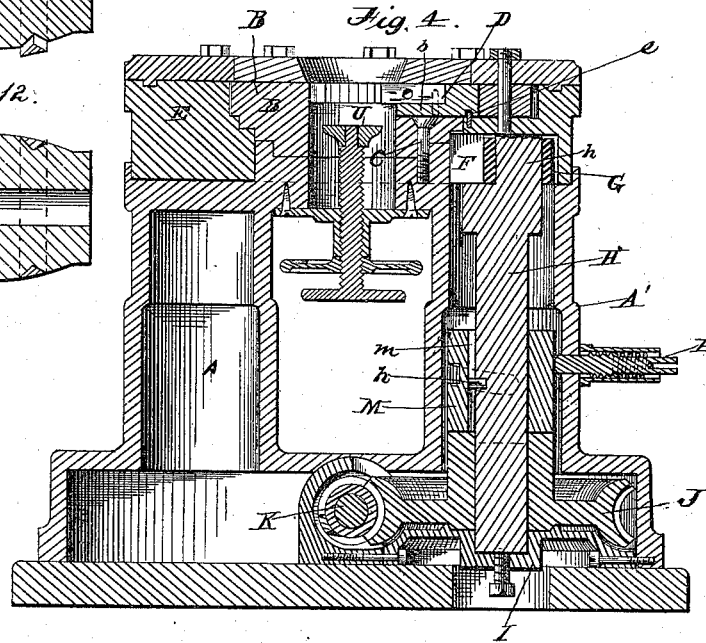


Fig. 4.



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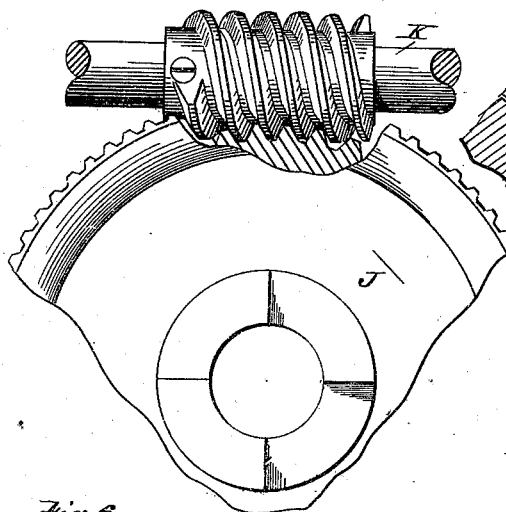
W. KRUTZSCH.

# BAND COMPRESSING MACHINE.

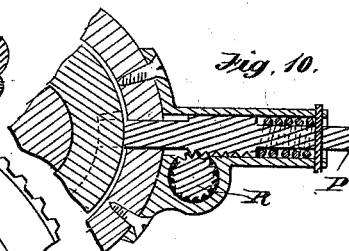
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Fig. 5.



*Fig. 10.*



*Fig. 8.*

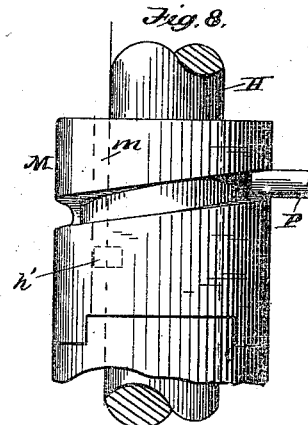


Fig. 9.

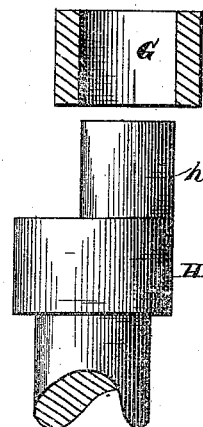
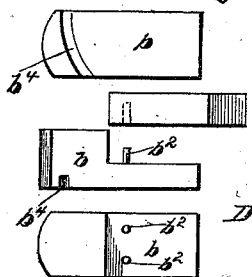


Fig. 7.



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# UNITED STATES PATENT OFFICE.

WILLIAM KRUTZSCH, OF DAYTON, OHIO, ASSIGNOR TO THE BUCKEYE IRON  
AND BRASS WORKS, OF SAME PLACE.

## BAND-COMPRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 265,679, dated October 10, 1882.

Application filed July 10, 1882. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM KRUTZSCH, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Band-Compressing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are respectively front and end elevations of a machine embodying my improvements. Fig. 3 is a top plan view of the same with a portion of the casing broken away. Fig. 4 is a longitudinal vertical section taken on the line *y y*, Fig. 1. Figs. 5 to 10 are detail views of various parts of the machine. Fig. 11 is a sectional view of a hub, showing the uncompressed band upon it; and Fig. 12 is a similar view of a finished hub.

Similar letters of reference in the several figures denote the same parts.

My invention relates to improvements in band-compressing machines, and particularly that class of machines employed in compressing the metal bands upon carriage and wagon wheel hubs; and its novelty consists in certain improved details of construction and combinations and sub-combinations of parts, which will be hereinafter fully described, and pointed out in the summary or claims at the end of this specification.

In the accompanying drawings, A represents the main frame of the machine. B is an annular head or stock, secured rigidly by screws C or otherwise to the frame A, and having a series of radial grooves, in which are arranged a series of radially-sliding dies, D. Each of these dies consists of a metal block, *b*, of a width adapting it to fit accurately within its appropriate groove or way, two metal jaws, *b'* *b'*, mounted loosely upon pins *b''* *b''*, projecting upward from the block, as shown in Fig. 7, and a small spring, *b<sup>3</sup>*, of a spiral or other form, recessed into the proximate faces of the jaws and operating to keep the jaws pressed apart, as shown in Fig. 6. The jaws *b'* *b'* rest upon the inner shallower portion of the block, and their upper faces preferably lie flush with the deeper portion of the block, as shown in

Fig. 4, while their combined width, when closed together, as shown in Fig. 3, is equal only to that of the block. The upper portions of the radial grooves are slightly enlarged, so as to permit the jaws to spread apart slightly when slid outward, as shown in Fig. 6, and the sides of the jaws at their inner ends are beveled off, as shown in Fig. 6, so that when the dies are forced inward their jaws will all close and fit against each other, so as to form a complete unbroken circle, as shown in Fig. 3. The under face of the outer portion of each block is provided with a cam-groove, *b<sup>4</sup>*, (shown in Figs. 4, 6, and 7,) and with the cam-groove of each block one of a series of studs or pins, *e*, on the upper side of a large semi-rotating ring, E, is adapted to engage, as shown in Figs. 4 and 6. This ring E is suitably recessed into the frame A, so as to be properly guided and held to its bearings while being turned. It is provided with a series of rollers, E', against which the outer ends of the die-blocks are adapted to bear when the ring is rotated, as will be farther on explained, and it is further provided with a radial slot, F, as shown in Fig. 6, in which is adapted to work back and forth a rectangular slide, G, mounted upon and receiving motion from the wrist *h* of a vertical crank-shaft, H, as shown in Figs. 4 and 9, said crank-shaft being inclosed in one of the hollow standards A' of the frame and having its lower end resting in a suitable step, I, at the base of the machine, as shown in Fig. 4.

Mounted upon the shaft H so as to turn freely thereon is a gear-wheel, J, with the teeth of which meshes an endless screw or worm on a counter-shaft, K, (shown in Figs. 4 and 5,) said counter-shaft being driven by means of a belt applied to a pulley, L, secured to its outer end, or in any other suitable manner. Also mounted upon the shaft H, above the gear-wheel J, is a gravitating toothed clutch, M, (shown in Figs. 4 and 8,) which is adapted, when free, to engage with the toothed hub of the gear-wheel. A vertical groove, *m*, is formed in the inner wall of the clutch, and into this groove extends a pin or stud, *h'*, projecting from the shaft H, as shown in Figs. 4 and 8. From this construction it follows that when the clutch is engaged with the hub of the gear-wheel and the

latter is rotated the shaft will be likewise rotated, but when the clutch is raised so as to disconnect it from the hub the motion of the shaft will be arrested. The clutch is further provided with an internal spiral groove, *o*, with which a sliding spring-seated pin, *P*, is adapted to engage. The side of pin *P* is toothed, and a pinion, *R*, on a vertical shaft, *S*, meshes into these teeth. A hand-lever, *T*, is secured to the upper end of shaft *S*, and when turned in one direction it rotates the shaft and causes the pinion to retract the spring-pin, but when released the spring-pin is projected forward against the clutch, either inside or outside of the groove *o*, according to the position of the clutch. When the clutch and hub are engaged, as shown in Figs. 4 and 8, and the clutch is rotated, the spring-pin presses against the periphery of the clutch until the upper end of the spiral slot comes opposite it, and then the pin projects itself within the slot. Continuing then to revolve, the clutch, riding on the pin in its slot, is gradually caused to rise on the shaft until finally it becomes entirely disengaged from the hub, thus arresting the rotation of the shaft, though the gear-wheel continues to rotate. Upon the retraction of the spring-pin by a movement of the hand-lever *T* it will withdraw once more from the slot and permit the clutch to fall by gravity upon the hub and again become engaged therewith and set in motion the shaft.

A description of the operation of the machine in compressing bands upon hubs will now be readily understood.

The grooved hub, with the metal bands placed loosely over the grooves, as shown in Fig. 11, is set on end upon an adjustable rest, *U*, (shown in Fig. 4,) with the uppermost band opposite the ends of the jaws of the dies. Motion is then imparted to the counter-shaft *K*, and the gear-wheel *J* is caused to slowly turn upon the shaft, *H*. Upon the spring-pin being now retracted, so as to permit the gravitating clutch to drop and engage with the hub, the shaft *H* will in turn be set in motion. As it revolves the wrist *h* will force the slide *G* inward and laterally, thereby causing a partial rotation of the ring *E* in one direction. This rotation of the ring causes its pins or studs *e* to operate in the cam-grooves *b'* of the die-blocks and move the dies forward, while at the same time the rollers *E'*, coming in contact with the rounded outer ends of the die-blocks, operate to force the dies forward, causing the ends of the jaws *b'* to close with great pressure upon the metal ring and compress it solidly within the groove of the hub. The continued rotation of the shaft then causes the slide to rotate the ring *E* back again, and the studs *e* draw the dies outward into their first position, their jaws opening by the action of the springs during such operation, as shown in Fig. 6. At the time the dies have fully closed in upon the band the spring-pin *P* is projected within the spiral groove *o* in the clutch, and consequently as the dies are drawn back by the continued

rotation of the shaft *H* the clutch is gradually lifted out of engagement with the hub of the gear-wheel, and unless the spring-pin is withdrawn from the slot, so as to allow the clutch to drop, the rotation of the shaft will be arrested.

In practice, when the dies begin to recede the hub is taken out and reversed, so as to bring the band on its other end opposite the dies, and the spring-pin *P* is withdrawn from the slot *o* by a movement of the hand-lever *T*, so as to permit the clutch to drop back into full engagement with the hub, and this, without allowing the clutch to disengage, sets the machine for operation upon that band also.

The bands employed in connection with this machine are preferably of the form and construction shown in another application for a patent filed and now pending. After being applied to the hub the bands are turned off flush with the surface of the wood, as shown in Fig. 11.

I claim as my invention—

1. In a band-compressing machine, the combination of a rest for the hub, the radially-grooved head, the radially-moving dies therein, and the semi-rotating ring having the rollers or cams for simultaneously forcing the dies inward, substantially as described.

2. In a band-compressing machine, the combination of a radially-grooved head with radially-moving dies operating simultaneously therein, each die having pivoted beveled jaws normally pressed apart by a spring, and adapted when forced inward to be closed by contact with the jaws of the adjoining dies, substantially as described.

3. In a band-compressing machine, the combination, with the radially-grooved head, of the dies arranged therein, each consisting of the metal block, the jaws pivoted thereto, and the springs between the jaws, substantially as described.

4. In a band-compressing machine, the combination of the radially-grooved head, the radially-moving dies consisting of the blocks and the pivoted jaws, and having the cam-grooves in their blocks, and the semi-rotating ring carrying the pins or studs which enter the cam-groove, and the rollers or cams for bearing upon the ends of the blocks to force the dies simultaneously inward when the ring is partially rotated, substantially as described.

5. In a band-compressing machine, the combination, with the radially-grooved head, of the radially-moving dies, the semi-rotating ring having the radial slot, and the vertical crank-shaft having the slide on its wrist, substantially as described.

6. The combination, with the semi-rotating ring having the radial slot, of the vertical crank-shaft having the pin or stud therein, the slide on its wrist, the internally-grooved gravitating clutch, and the loosely mounted gear-wheel, the whole arranged and operating substantially as described.

7. The combination, with the vertical crank-

shaft having the pin or stud, of the gravitating clutch having the vertical internal groove and the external spiral groove, the gear-wheel having the toothed hub for co-operating with the clutch, and the spring-pin for engaging with the spiral groove of the clutch, the whole arranged and operating substantially in the manner described.

8. The combination, with the spirally-grooved clutch, of the spring-pin having the teeth on its side, the pinion engaging with said teeth, the vertical shaft on which the pinion is mounted, and the hand-lever on said shaft, substantially as described.

9. The combination of the counter-shaft carrying the worm or endless screw, the vertical crank-shaft, the loose gear-wheel having the toothed hub, the gravitating clutch, and means for raising the clutch to disengage it from the hub, substantially as described.

10. The combination, with the radially-moving dies, of the adjustable rest for the hub, substantially as described.

WILLIAM KRUTZSCH.

Witnesses:

QUINCY CORWIN,  
WILLIAM B. SULLIVAN.