



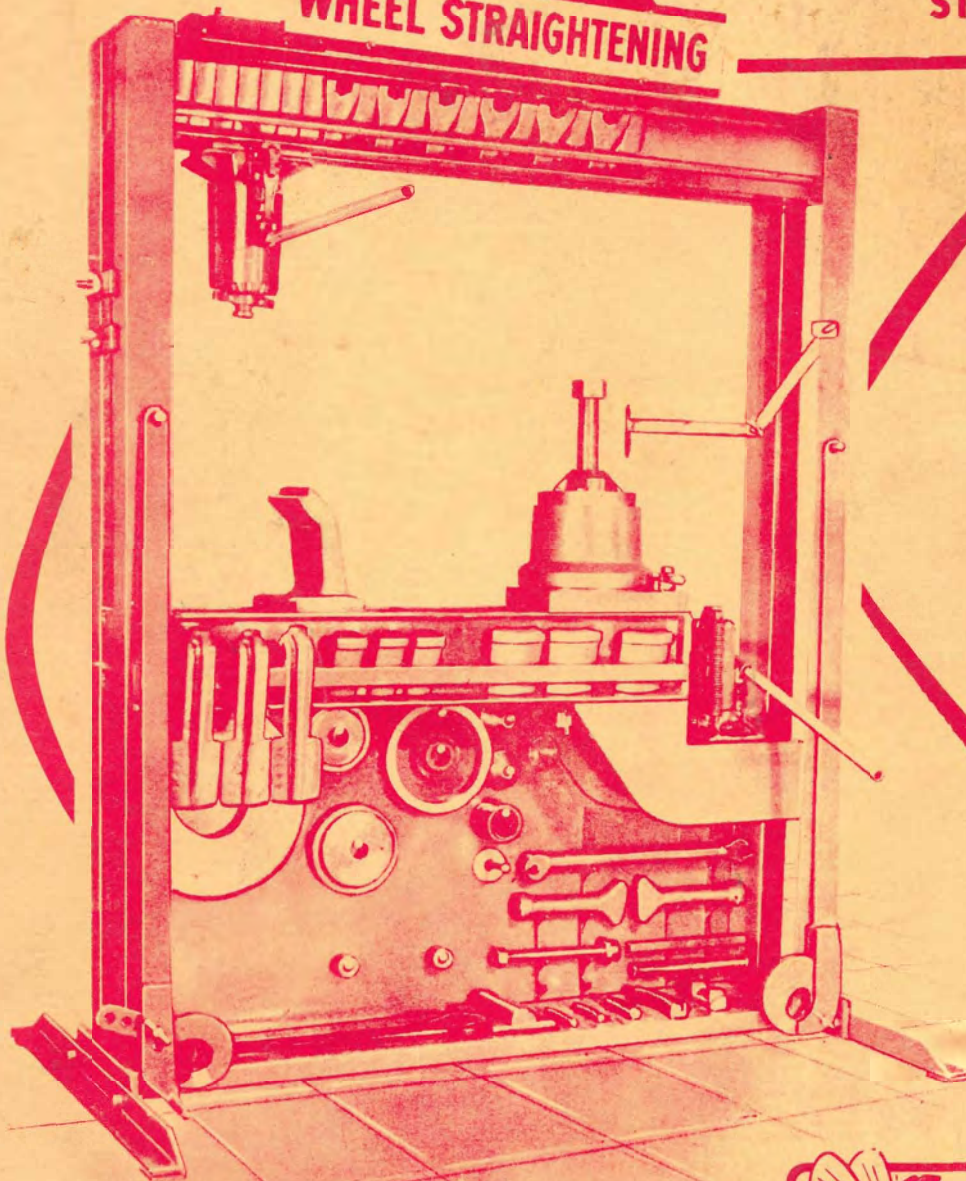
Bee Line

Bee Line
AUTOMOTIVE ALIGNMENT

WHEEL STRAIGHTENING

WHEEL, HUB AND BRAKE DRUM
STRAIGHTENER

Service Manual

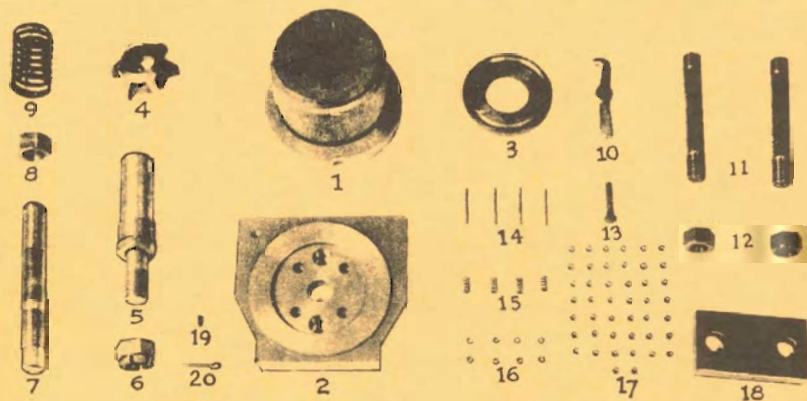


Bee Line
Company

DAVENPORT, IOWA, U.S.A.

PARTS LIST

BEE-LINE WHEEL, HUB AND BRAKE DRUM STRAIGHTENER

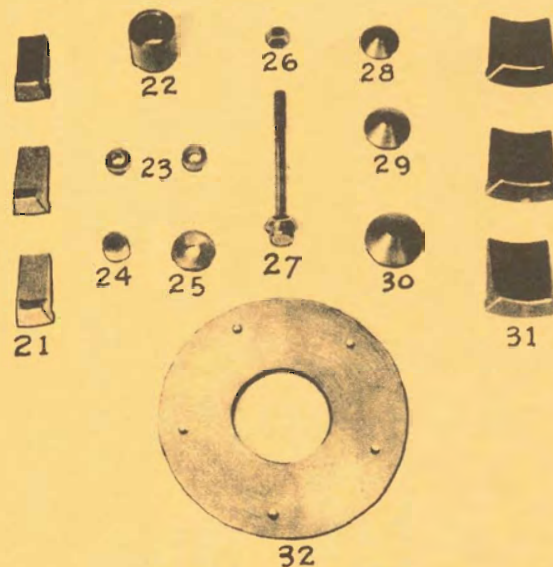


UNIVERSAL HUB ASSEMBLY

- | | | | |
|-----------|--------------------------|-----------|------------------------------|
| 1 WH-354 | Universal Hub | 11 WH-360 | Base Clamp Stud (2) |
| 2 WH-351 | Universal Hub Base | 12 | 1 1/4" NF Hex Nuts (2) |
| 3 WH-352 | Ball Race | 13 | 1/2 x 2 1/2 NC Hex Cap Screw |
| 4 WH-356 | Wheel Centering Cone | 14 WH-362 | Ball Race Studs (4) |
| 5 WH-355 | Hub Spindle | 15 W-214 | Race Adj. Springs (4) |
| 6 | 1 1/2" NF Hex Castle Nut | 16 | 1/4 NC Hex Jam Nuts (8) |
| 7 WH-357 | Wheel Clamp Shaft | 17 W-84 | 3/8" Steel Balls (44) |
| 8 | 1 1/2" NF Hex Nut | 18 WH-361 | Base Clamp Plate |
| 9 W-237 | Spring Centering Cone | 19 | 5/16 x 3/4 Allen Set Screw |
| 10 WH-364 | Hub Locking Handle | 20 | 1/4 x 2 Cotter Pin |

HUB & DRUM ATTACHMENT

- | | |
|-------------|------------------------------|
| 21 WH-375-S | Small Hub Support Blocks (3) |
| 22 WH-373 | 2 1/2 Hub Cone Spacer |
| 23 WH-371 | 1/2 Hub Cone Spacer (2) |
| 24 WH-372 | 1" Hub Cone Spacer |
| 25 WH-370 | 1/4 Hub Cone Spacer |
| 26 | 3/4 NC Hex Nut |
| 27 WH-366 | Hub Center Shaft |
| 28 WH-367 | Small Hub Cone |
| 29 WH-368 | Medium Hub Cone |
| 30 WH-369 | Large Hub Cone |
| 31 WH-375-L | Large Hub Support Blocks |
| 32 WH-382 | Brake Drum Support Plate |



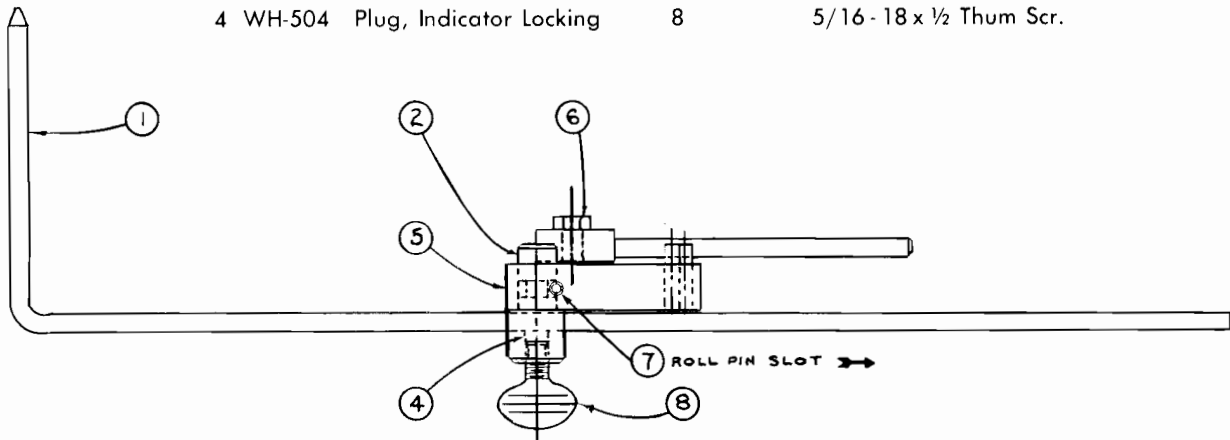
WHEEL STRAIGHTENING PARTS & ATTACHMENTS

33 W-204	Hub Shell Holders (8)
34 W-205	Hub Shell Holders (6)
35 W-208	Hub Shell Holders (6)
37 W-246B	Plain Rim Punch 9 3/4"
38 W-247B	Grooved Rim Punch 14"
39 W-252	Wide Rim Pusher (3)
42 W-297	Rocker Jack Base
43 W-245	Bolt Hole Punch
44 W-291	Straight Edge
45 W-275-386	Flange Finisher
46 W-203	Box Wrench
47 WH-442	Adapter, Rim Pusher
48 WH-435A	Pusher, Mounted Rim
49 WH-395-A	Rim Anvil 14"
50 WH-410	Wheel Holding Clamp
51 WH-408	Wheel Holding Hook
52 CA-165	1/2 x 3 NC Cap Screws (Full thd.) (2)
53	1/2 Wing Nuts (2)
54 WH-378	6 1/2 Wheel Clamp Plate
55 WH-377	5 1/8 Wheel Clamp Plate
56 WH-376	3 1/2 Wheel Clamp Plate
57 WH-379	Universal Hub Ring
58 W-295	Wheel Hold Down Channel
59 W-152	Inverted Jack Holder Top
60 W-153	Inverted Holder Roller
61 W-155	Inverted Roller Axle
62 WH-482A	Inverted Jack Base
63 W-154	Inverted Base Guide Roller
64	1/2 NC Hex Nuts (4)
65	3/8 x 3/4 Socket Head Cap Screw Screws (2)
66 EA-89A	Jack, Lower Upright
67 EA-89Al	Jack, Upper Inverted
68	Jack Handles (2)
69 WH-432	Spring, Ram Return
70 WH-430	Clamp, Jack Return (4)
71	10/32 x 1/2 (4)
72	10/32 Hex Nuts (4)
73	Name Plate
74	Drive Screws, Name Plate (8)

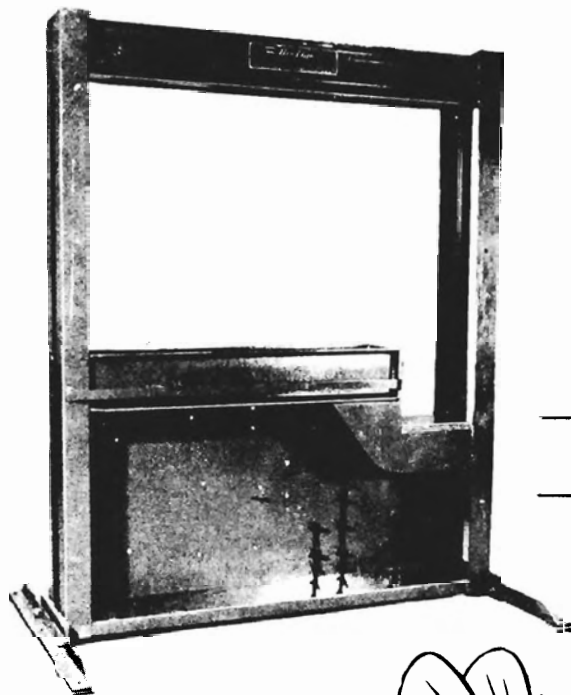


76 WH-416	3/4 Studs (2)
77 WH-414	1 1/8 Studs (30)
78 WH-415	2 1/4 Studs (3)
79	3/8 NF Hex Nuts (35)
80 WH-451-A	Wide Wheel Wrench Head
81 WH-458-A	Narrow Wheel Wrench Head
82 WH-452	Wide Wheel Wrench Hook
83 WH-459	Narrow Wheel Wrench Hook
84 WH-460	Retain Pin (2)
85 WH-454	7/8 Bearing Pin
86 WH-455	3/8 Bearing Pin
87 WH-456	1/2 Bearing Pin

- | | | | |
|----------|-------------------------|----------|---------------------------|
| 1 WH-501 | Indicator | 5 WH-505 | Plate, Mounting |
| 2 WH-502 | Post, Indicator Pivot | 6 1834 | Bolt Pivot |
| 3 WH-503 | Locking Arm | 7 | 3/16 Dia. x 7/8 Roll Pin |
| 4 WH-504 | Plug, Indicator Locking | 8 | 5/16 - 18 x 1/2 Thum Scr. |



WH-471 Wheel Straightener Sign Assembly



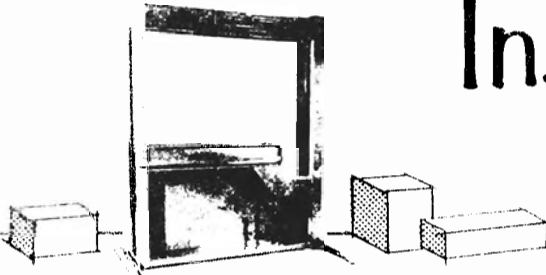
WH-400 Frame Assembly



WHEEL, HUB AND BRAKE DRUM STRAIGHTENER

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Installation Instructions



When you receive your Bee Line Wheel Straightener, the Universal Hub and all the tools will be packed in boxes. The first thing to do is to check all parts to be sure there are no parts missing.

Select a suitable location for your machine. The photo of the complete wheel straightener will help you to assemble the parts on the frame.

The Universal Hub should be placed on the press bed so that the edge of the hub base is flush with the end of the bed channels. The Hub is secured to the frame by means of two $1\frac{1}{4}$ " studs screwed into the hub base. Note that the thread length is shorter on one end. Be sure the short end is screwed into the hub base. The lower ends of the studs pass through holes in the steel plate $1'' \times 4'' \times 6\frac{1}{2}''$. Clamp in place with the two remaining $1\frac{1}{4}$ nuts. Be sure the centering cone spring is on the centering shaft inside the hub, then place the wheel centering cone on the shaft as illustrated in this manual. The $1\frac{1}{2}''$ shaft is used for all wheels and the $\frac{3}{4}''$ shaft for all hubs and drums.

Two Hydraulic Jacks are furnished. One is to be used on the lower step of the frame for pushing upwards. The other is labeled "Inverted Jack" and is to be mounted on the under side of the upper frame channels for pressing downward. See illustration for proper mounting of upper Jack carriage.

Holes are provided in the back sheet of the frame and front vertical angles to receive threaded pins which hold the various tools in place. The current catalogue illustrations will show the correct location of all tools and parts.

PLAIN RIM ANVIL

The first step in repairing any wheel or hub is to clean the dirt and grease from it before the straightening operation.

In the case of badly bent pressed steel wheels, the drop center rim is usually bent or distorted in one or more places. The method best used to remove these bends is to use the Rim Anvil. This tool is designed to fit all rims and has two operating sides, one, a narrow concave side and the other an offset concave and radius shape. The narrow side is illustrated in Fig. 1 and is used to straighten a flange that has been bent in towards the hub.

In Fig. 1, place the wheel upon the narrow side of the anvil with the upper side of the wheel inclined 15 or 20 degrees so that it rests upon the end of the frame press. Slide the wheel holding hook down so that it will hold the upper part of the wheel against the frame press. Two rim punches are furnished, a grooved and a plain. Either may be used according to the nature of the bend. Press with the inverted jack until the bent condition is corrected.

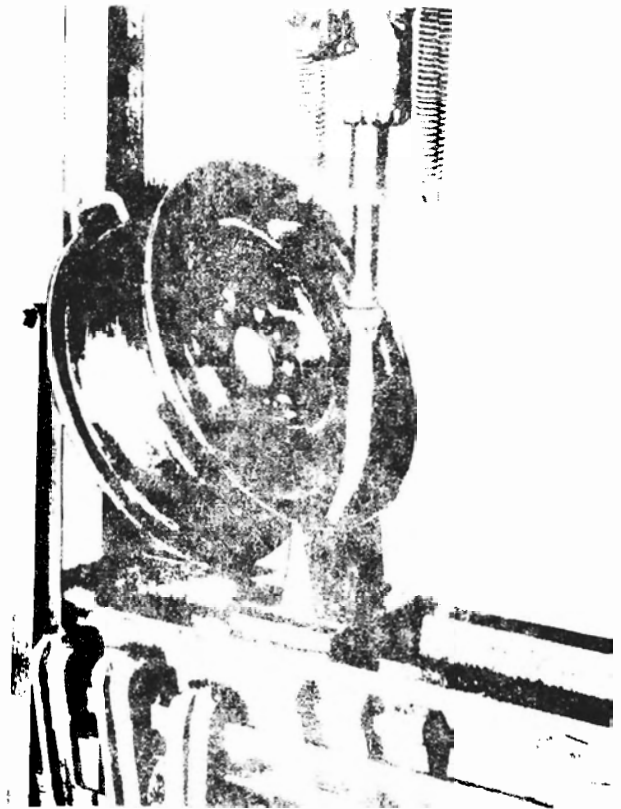


Fig. 1

OFFSET RIM ANVIL

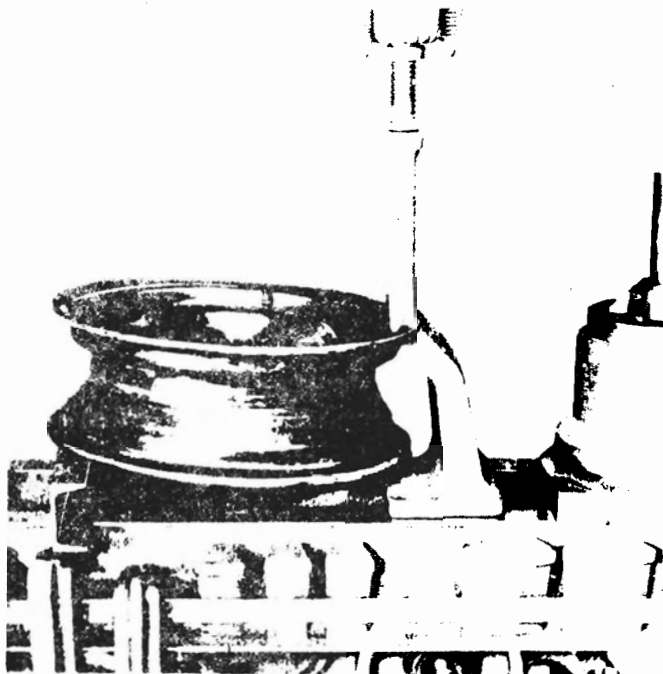


Fig. 2

If a rim flange has been bent over toward the opposite side of the wheel, it may be restored to its normal position by using the heavy side of the rim anvil containing the curved shoulder. In this case, the anvil is moved closer towards the universal hub so that the wheel may be placed in a horizontal position, with the lower flange of the rim resting upon the 4" channel as shown in Fig. 2. The bent portion of the upper rim flange is supported in the curved groove of the rim anvil while pressure is applied to the drop center or rim base corner with the type of bend in the rim.

Either the center or the grooved rim punch may be used according to the type of bend to be corrected.

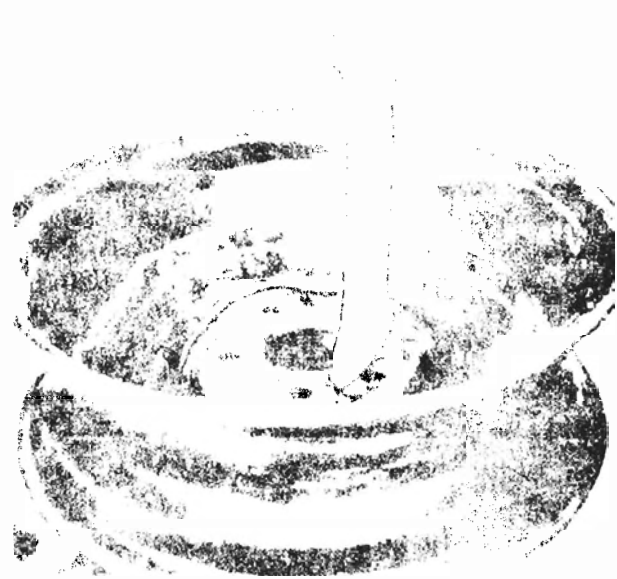
WHEEL CENTER AND RIDING BASE



In all cases before mounting upon the Universal Hub, be sure the wheel for a distorted condition, a very common condition.

The wheel should be pressed upon the press bed with the inner rim turned upward.

Fig. 3 shows how to check wheels for distorted condition. A square straight edge is used. A round wheel clamp plate is used to check the complete wheel.



When the wheel is mounted on the press bed, the straight edge should be placed across the center of the wheel. The straight edge should be held in place by a small metal block or clamp. The straight edge should be held in place by a small metal block or clamp.

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MOUNTING WHEELS ON THE UNIVERSAL HUB

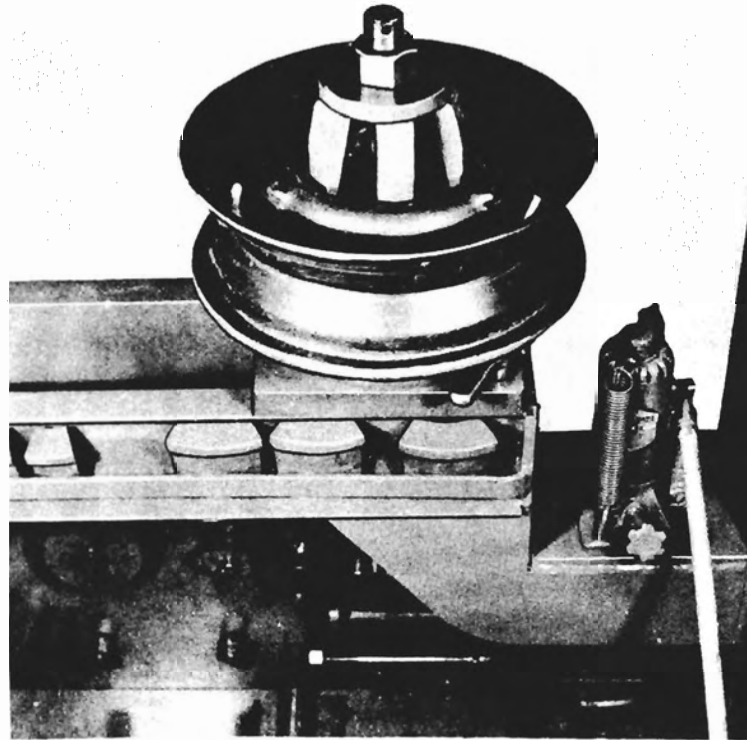


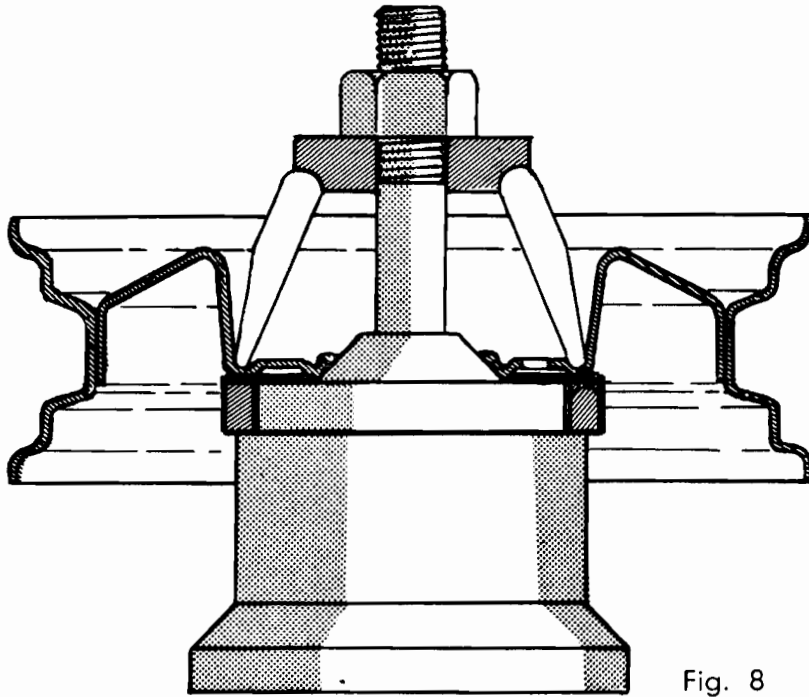
Fig. 7

Fig. 7 shows a popular type of pressed steel wheel mounted on the Universal Hub and ready for the checking and straightening operations.

To install the wheel on the Universal Hub, place the wheel over the center shaft so that as it rests upon the automatic centering cone, the inner side of the wheel is down. The outer portion of the wheel center is embossed so that there are one or two hub contact spots for each bolt hole. Select a set of holding fingers, W-204,205,206 and W-208, so that the fingers fit directly over the contact spots.

If the wheel center is larger than the top of the Universal Hub, use the hub ring as shown in Fig. 8. Select a wheel clamp plate a little smaller than the hub contact circle and place it over the center shaft so that it rests on top of the holding fingers. One holding finger is used for each bolt hole. Clamp the wheel securely to the Universal Hub by tightening the nut or the center shaft, so that no distortion of the wheel center will result from the operation to be performed on the wheel.

WHEELS WITH INVERTED BOLT HOLES



CHECKING WHEELS

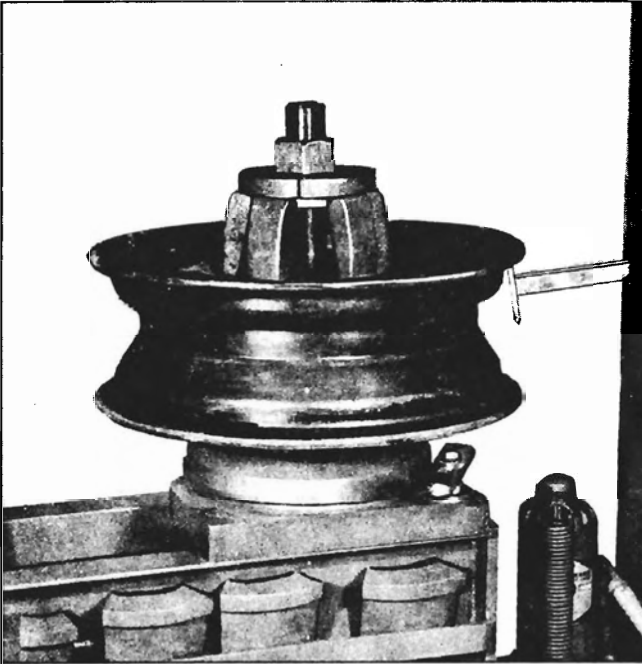


Fig. 10,

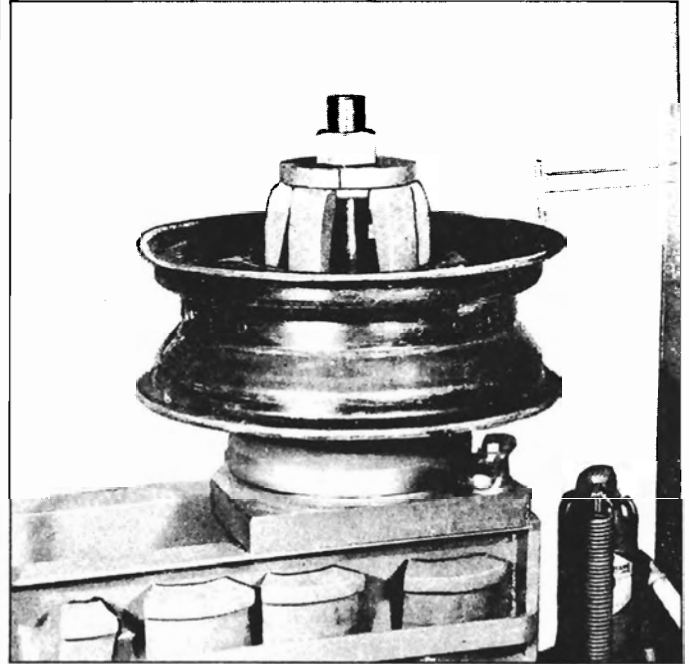


Fig. 11

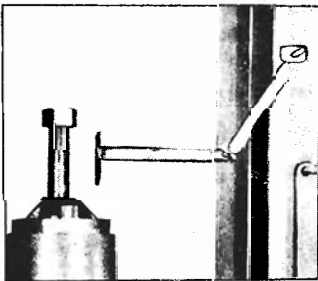


Fig. 10A

Fig. 10, 11, 12 and 13 illustrate a wheel mounted upon the Universal Hub with the gauge in position for checking the wheel. The gauge should be clamped to the front member of the frame as shown in Fig. 10A. The important parts of a wheel to gauge are the two rim bases and the two outer flanges. Fig. 10 shows the gauge in position for checking wobble and run out of the upper rim base.

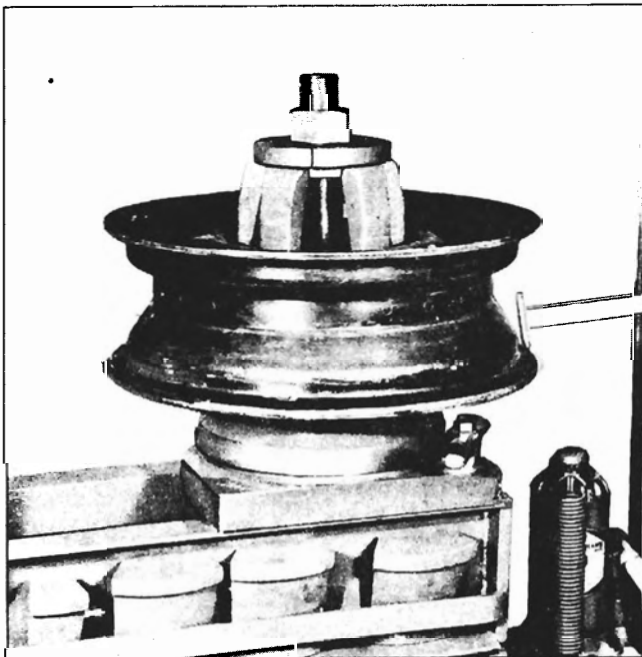


Fig. 12

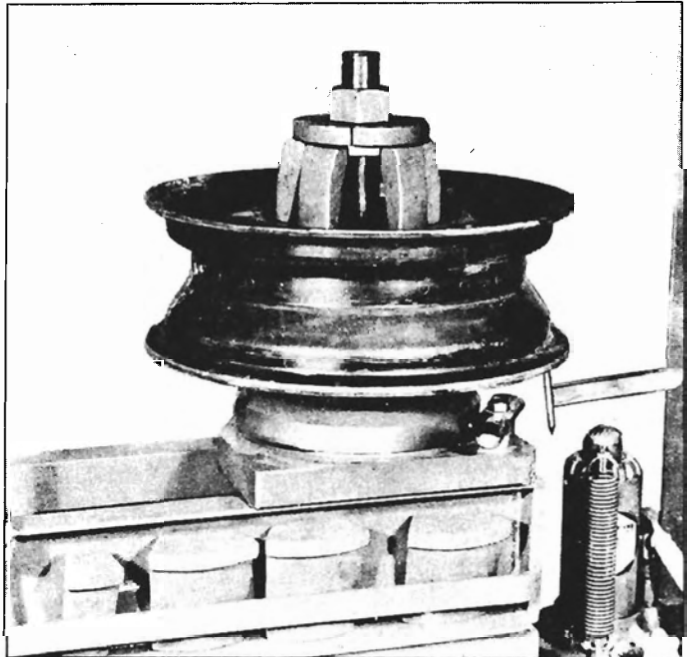


Fig. 13

STRAIGHTENING PRESSED STEEL WHEELS

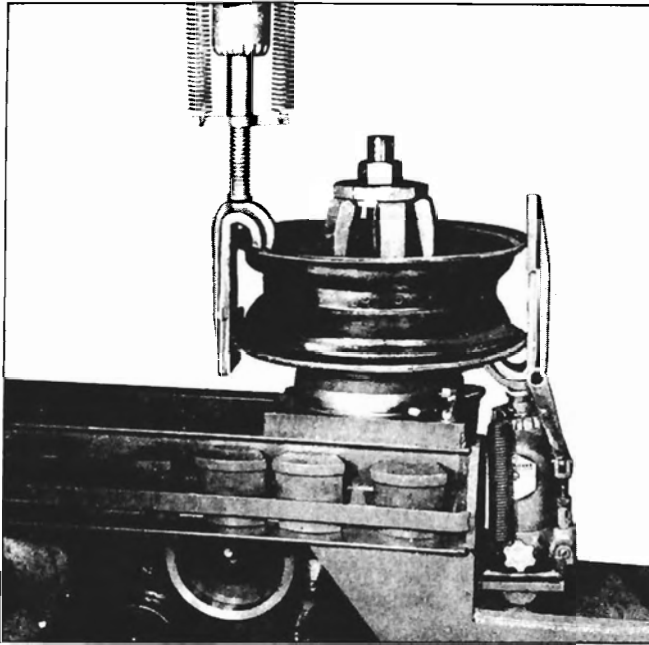


Fig. 14.

To correct such a condition, use two rim pushers and press down and up respectively with two jacks as shown in Fig. 14. The lower jack should be placed upon its rocker jack base. This jack base is used to permit the jack to tilt sideways as the wheel is pressed upward. The lower side of the wheel does not move straight up as the wheel is being straightened, but should move in an arc about the neutral axis of the wheel. This method will automatically bring the wheel to a natural round shape and eliminate any eccentric tendency in the finished wheel. For wide wheels use the WH-435A or WH-442 inserted in the lower rim pusher as shown in Fig. 14-A and 14-B.

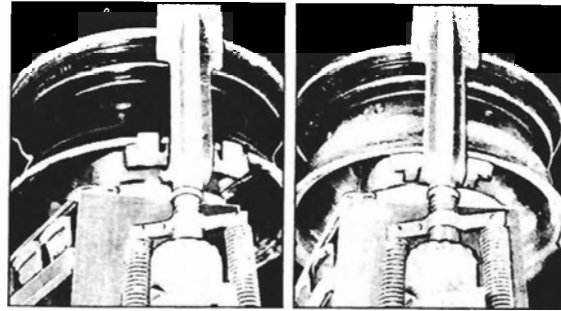


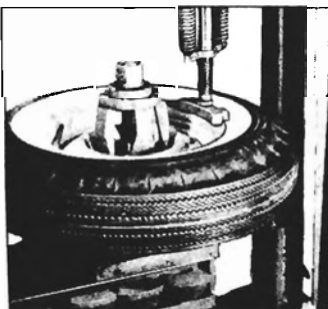
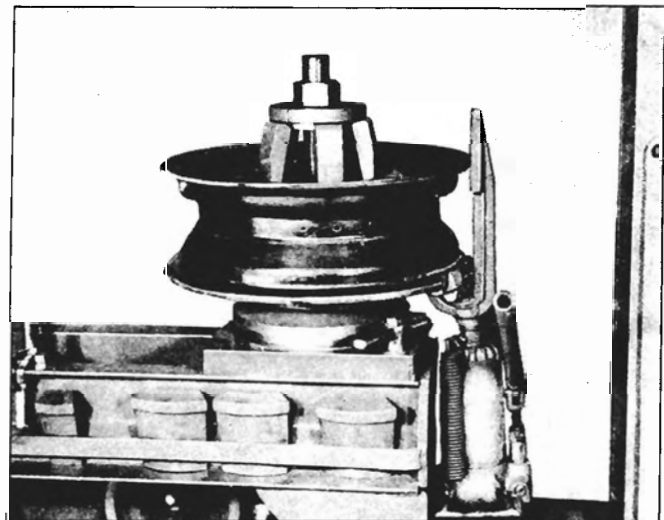
Fig. 14-A

Fig 14-B

In most cases of bent steel wheels, one side of the wheel will be bent in towards the brake drum. The resulting force will cause the wheel to bend outward at a point diametrically opposite the first bend. This action is due to greater stiffness in the rim than in the pressed steel body of the wheel.

Fig. 15

If a wheel is bent only a small amount, it may be straightened easily and quickly by using only one jack as shown in Fig. 15. The pressure may be applied upward as shown or the inverted jack may be used and pressure applied from the top.



A wheel with only a slight amount of bend may be straightened without removing the tire from the rim. Mount the wheel and tire on the Universal Hub in the usual manner and apply pressure carefully with both jacks. Where jack contacts rim flange use the "Mounted rim pusher" adaptors No. WH-435A to protect rim flange during straightening operation.

BUCKLED WHEELS

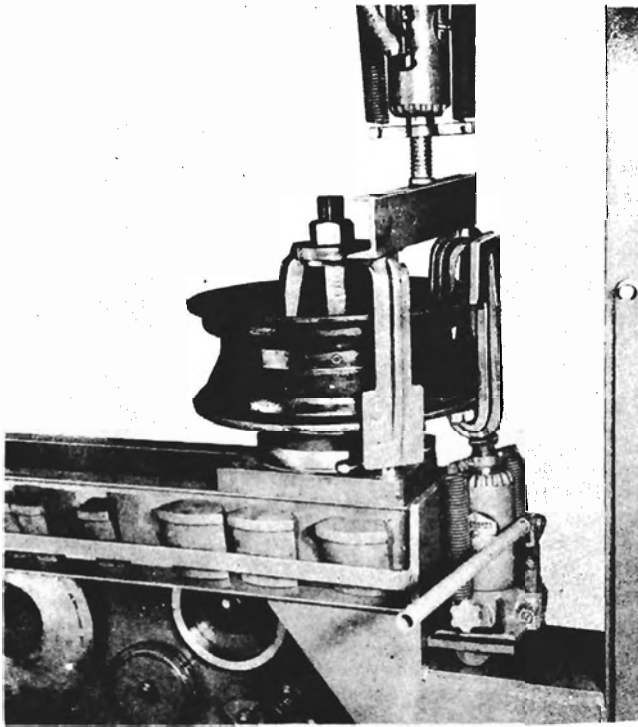


Fig. 16

STRAIGHTENING RIM FLANGES

After removing the major bends from the pressed steel wheels as described on the preceding pages, use either one of the two rim straighteners as shown in Fig. 17, 18 and 19. These three illustrations show some of the most common types of rim straightening operations. The rim straightening jaws and heads are so designed to fit either outside or inside curves of rims, resulting in a very universal set of rim straightening tools.

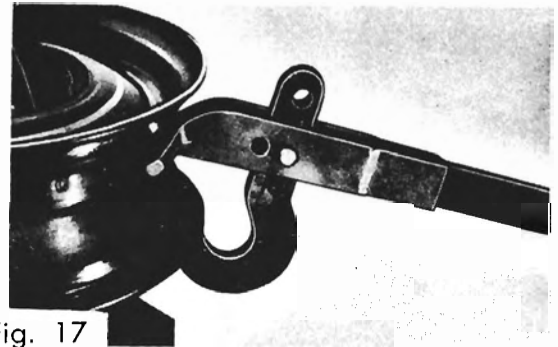


Fig. 17

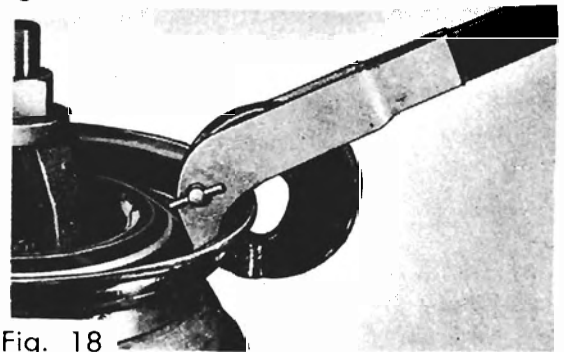


Fig. 18

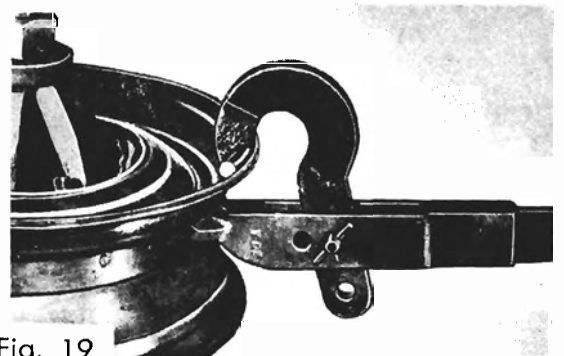


Fig. 19

STRAIGHTENING OUTER RIM FLANGES

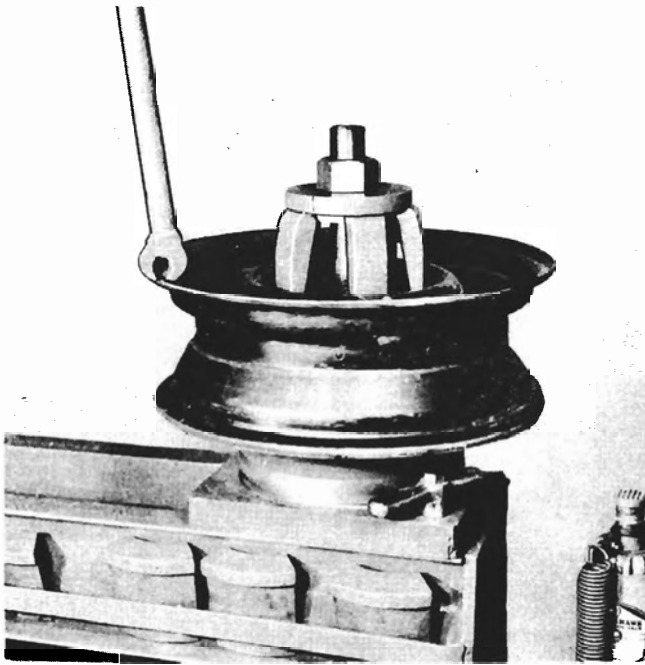


Fig. 20

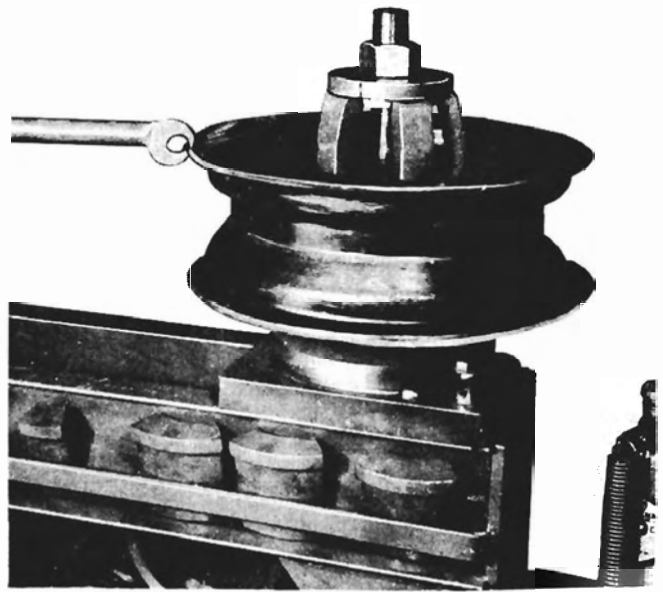
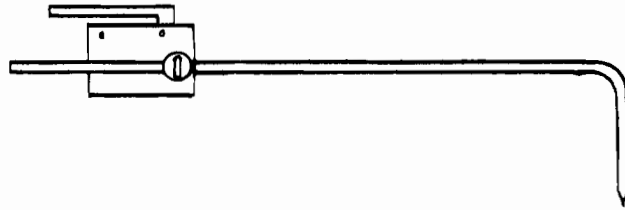


Fig. 21

The outer flanges of a rim are the first to absorb the shock when a wheel is damaged and are usually the only wheel part that is sharply bent and buckled.

Figure 20 and 21 illustrate a rim shaping tool especially designed to shape the outer edges of rim flanges.

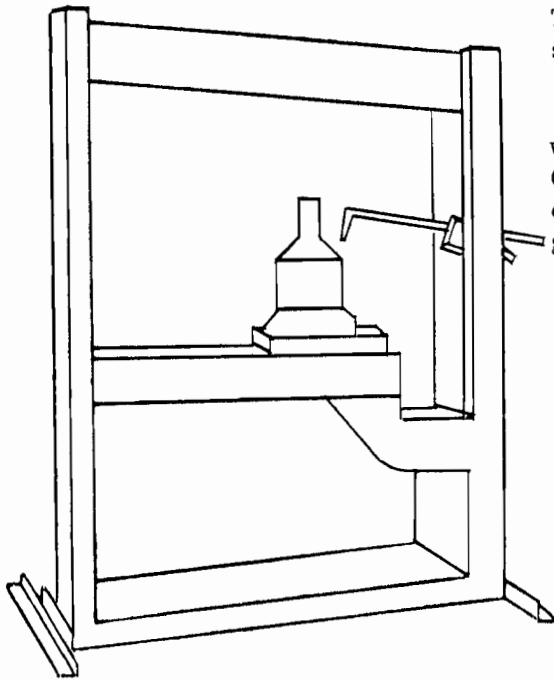
WH-500 Wheel Checking Indicator



The WH-500 Wheel Checking Indicator is designed to accompany The Bee Line Wheel Straightening Machine.

Mount the gauge on the wheel straightener frame as illustrated to check wheel run-out. The gauge may be tilted out of the way during straightening operations.

An alternate use of WH-500 is checking wheel run-out on the alignment machine. Clamp gauge to aligner "tubs" as shown. Jack end of vehicle and move aligner in to bring gauge tip in close to wheel. Rotate wheel.



Note that cam action lever secures gauge to frame of straightener or aligner. Back of gauge is color coded to indicate position of gauge on frame of straightener or aligner.

