BALE LOADER

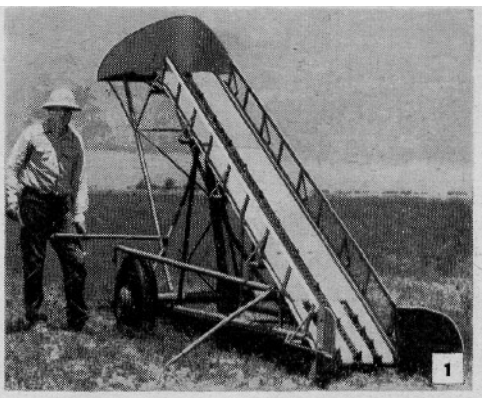
By Hi Sibley

This bale loader is constructed almost entirely of discarded car parts and stock sizes of both angle iron and sheet metal

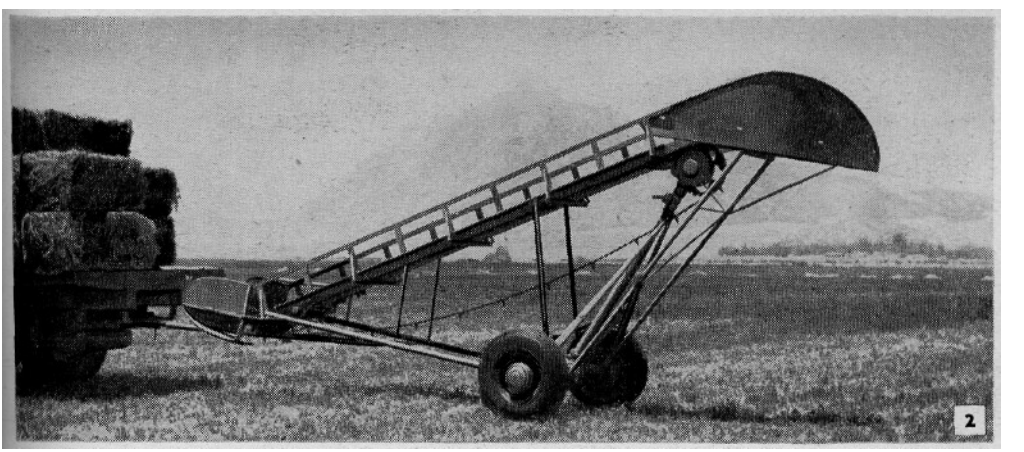
BUILT BY Lem Shaw and George Hammerschmidt, California ranchers, this efficient bale loader, coupled to the side of a truck, picks up individual bales from the field and elevates them high enough to enable one man to build a six-tier load on either a truck or trailer platform.

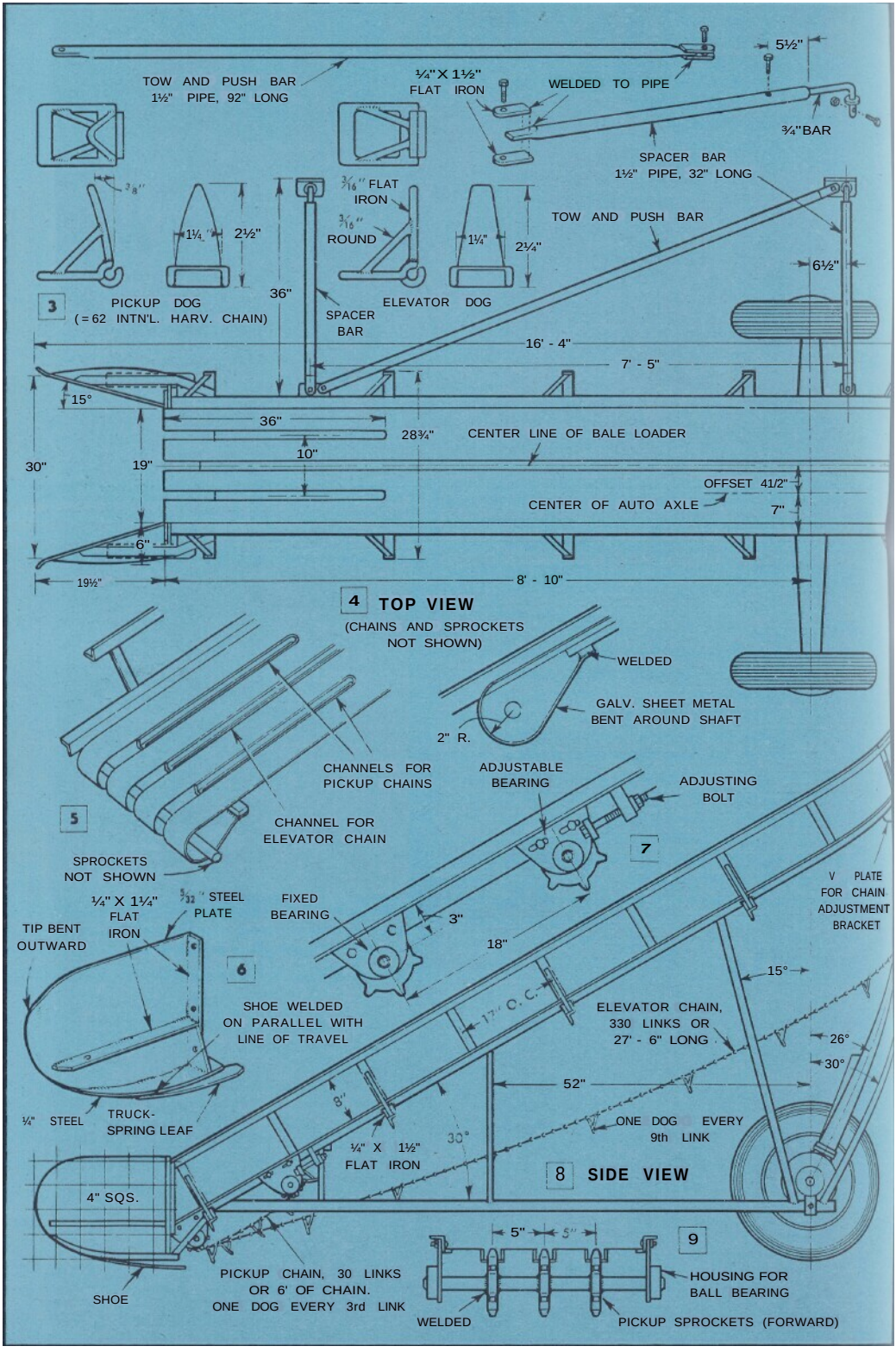
Fig. 1 pictures the offset hitch by means of which the loader is coupled to the side of the truck. The manner in which the loader is towed to and from the field behind the truck or trailer is shown in Fig. 2. Figs. 3. to 15, inclusive, detail the construction and assembly of the unit. First, note in the top view, Fig. 4, that the loader axle is offset to bring the loader as close as possible to the truck. The offset hitch is shown assembled for attachment to the side of the truck

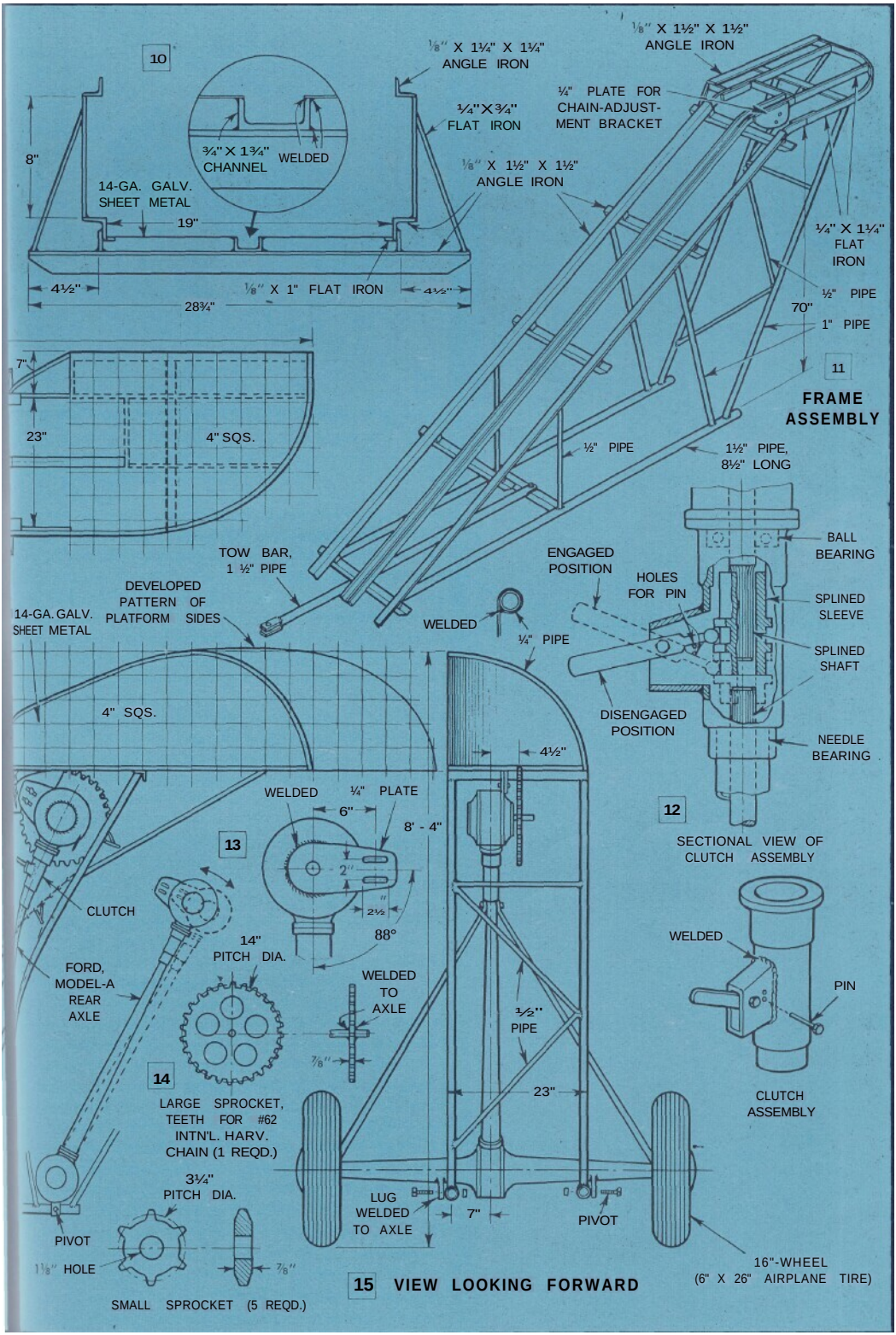
The neat, trim lines of the bale loader, shown above in operation, will appeal to every farmer who likes to build efficient, labor-saving equipment in his shop

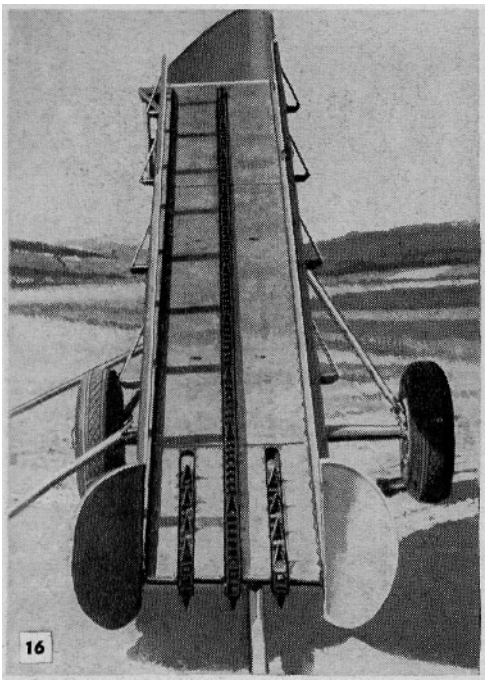


Above, an adjustable offset hitch of special design couples the loader to the side of the truck frame. Below, the loader coupled behind truck for transport

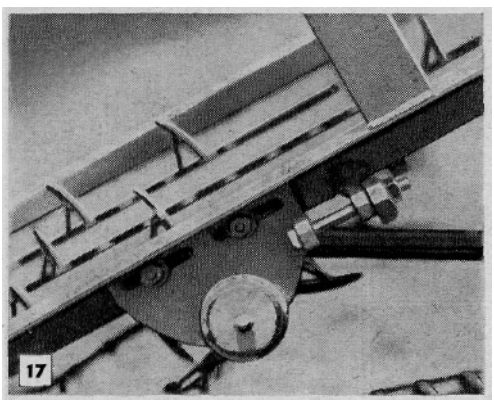



TOW AND PUSH BAR
1½" PIPE, 92" LONG
¼" X 1½"
FLAT IRON
WELDED TO PIPE
5½"
¾" BAR
SPACER BAR
1½" PIPE, 32" LONG
TOW AND PUSH BAR
6½"
3/8"
1¼"
2½"
3/16" FLAT IRON
3/16" ROUND
1¼"
2¼"
36"
3
PICKUP DOG
(= 62 INTN'L. HARV. CHAIN)
SPACER BAR
ELEVATOR DOG
16' - 4"
7' - 5"
15°
36"
28¾"
CENTER LINE OF BALE LOADER
10"
30"
19"
OFFSET 41/2"
CENTER OF AUTO AXLE
7"
6"
19½"
8' - 10"
4 TOP VIEW
(CHAINS AND SPROCKETS NOT SHOWN)
WELDED
GALV. SHEET METAL BENT AROUND SHAFT
2" R.
CHANNELS FOR PICKUP CHAINS
ADJUSTABLE BEARING
ADJUSTING BOLT
5
CHANNEL FOR ELEVATOR CHAIN
7
SPROCKETS NOT SHOWN
V PLATE FOR CHAIN ADJUSTMENT BRACKET
¼" X 1¼" FLAT IRON
5/32" STEEL PLATE
FIXED BEARING
3"
18"
TIP BENT OUTWARD
6
15°
SHOE WELDED ON PARALLEL WITH LINE OF TRAVEL
17" C. C.
ELEVATOR CHAIN, 330 LINKS OR 27' - 6" LONG
26°
30°
52"
¼" STEEL
TRUCK-SPRING LEAF
8'
ONE DOG EVERY 9th LINK
¼" X 1½" FLAT IRON
30°
8 SIDE VIEW
4" SQS.
5"
5"
9
HOUSING FOR BALL BEARING
SHOE
PICKUP CHAIN, 30 LINKS OR 6' OF CHAIN. ONE DOG EVERY 3rd LINK
WELDED
PICKUP SPROCKETS (FORWARD)

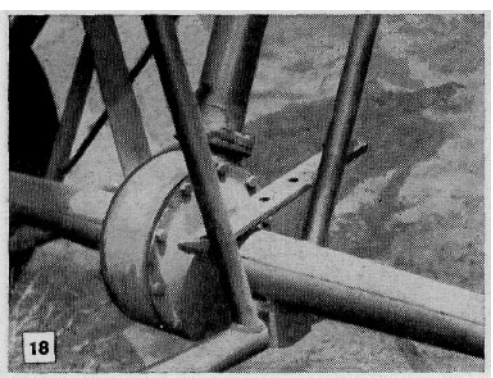

10
⅛" X 1¼" X 1¼" ANGLE IRON
¼"X¾" FLAT IRON
¾"X 1¾" CHANNEL WELDED
8"
14-GA. GALV. SHEET METAL
19"
4½"
28¾"
⅛" X 1" FLAT IRON
4½"
⅛" X 1½" X 1½" ANGLE IRON
¼" PLATE FOR CHAIN-ADJUST-MENT BRACKET
⅛" X 1½" X 1½" ANGLE IRON
¼" X 1¼" FLAT IRON
½" PIPE
70"
1" PIPE
11
FRAME ASSEMBLY
½" PIPE
1½" PIPE, 8½" LONG
7"
23"
4" SQS.
TOW BAR, 1 ½" PIPE
DEVELOPED PATTERN OF PLATFORM SIDES
14-GA. GALV. SHEET METAL
4" SQS.
WELDED
¼" PIPE
ENGAGED POSITION
HOLES FOR PIN
BALL BEARING
SPLINED SLEEVE
SPLINED SHAFT
DISENGAGED POSITION
NEEDLE BEARING
12
SECTIONAL VIEW OF CLUTCH ASSEMBLY
4½"
WELDED
¼" PLATE
6"
8' - 4"
13
2"
2½"
88°
CLUTCH
14" PITCH DIA.
FORD, MODEL-A REAR AXLE
WELDED TO AXLE
⅞"
½" PIPE
23"
14
LARGE SPROCKET, TEETH FOR #62 INTN'L. HARV. CHAIN (1 REQD.)
3¼" PITCH DIA.
PIVOT
1⅛" HOLE
⅞"
SMALL SPROCKET (5 REQD.)
LUG WELDED TO AXLE
7"
PIVOT
16"-WHEEL (6" X 26" AIRPLANE TIRE)
15 VIEW LOOKING FORWARD
WELDED
PIN
CLUTCH ASSEMBLY

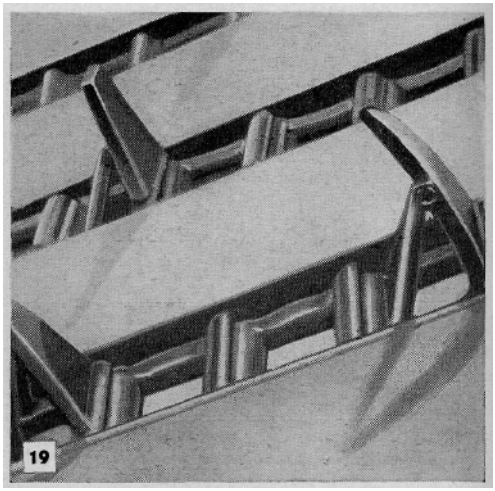


Short pickup chains start bale on its way up the elevator bed, or "flight," to the loading platform



Above, chain tighteners are fitted on the pickup idler shaft. Below, ground drive is through car axle





Lugs on the pickup chain are curved slightly to release bale. Those on the elevator chain are straight

frame. The parallel spacing bars are adjustable so that the loader can be located to suit the width of the truck platform. The long member of the hitch, top detail in Fig. 3 and also Fig. 11, serves the dual purpose of tow bar when the loader is towed on the road and that of push bar when the hitch is assembled for operation of the loader in the field. The three views of the drive mechanism, Figs. 13, 14 and 15, show the assembly of the drive unit. Note that the offset axle brings the drive sprocket, Fig. 14, in the center of the elevator bed. This position lines up the sprocket with the channel for the elevator chain, Figs. 4 and 5.

Two Ford Model-A rear axles are assembled to form the drive as in Figs. 13, 14, 18 and 21. One axle, with the housings removed, is mounted on the end of the torque tube of the second axle which is used intact, including the radius rods, Fig. 15. The open ends of the upper differential housing are closed with steel plates, welded on. One plate extends to form a mounting bracket, Fig. 13, and is bored and slotted for mounting bolts and for the drive-sprocket shaft. The throwout clutch mounted on the end of the torque tube between the two differentials is assembled from stock parts as in Fig. 12. In addition to the large drive sprocket, Fig. 14, five small sprockets of 3½-in. pitch diameter are required to carry the elevating chain and the pickup chains. The pickup chains travel in steel channels welded into the lower end of the elevator bed as in Fig. 5. The pickup sprocket assembly, with fixed and adjustable bearings, is detailed in Fig. 7, and is also pictured in Figs. 16, 17 and 19.

The bottom of the elevator bed, or "flight," is covered with galvanized sheet metal and the sides are built up and braced as in Figs.

4, 8 and 10. Sheet metal forms the floor of the bale platform at the top of the elevator bed, Fig. 20. The sheet-metal guide, or fender, which forms one side and the end of the bale platform, is curved to turn the bale as it slides onto the platform. A layout pattern for cutting the sheet-metal part to correct size is shown in Fig. 8, and the detailed pattern for the bottom of the platform is shown in Fig. 4. Note that a "beading" of ¼-in. pipe is welded to the top edge of the platform fender, Fig. 15. The wings, or gatherers, Fig. 16, are made up for both right and left sides as in Fig. 6. A shoe is welded to the bottom of each wing to carry the lower end of the elevator. It is important that each shoe be welded parallel with the line of travel, otherwise it will wear rapidly and may cause side draft.

The lugs, or dogs, welded to the elevator chain are straight while those on the short pickup chains are curved back as in Fig. 3. This backward curve is important as it permits the lugs to disengage freely from the bale as they pass downward over the idler sprockets. Tension on the pickup chains should be sufficient to prevent buckling. Chain tension can be changed by adjusting the idler sprockets, Fig. 7.

After the frame and elevator assembly has been completed, the axle assembly is trial-fitted in the frame and mounting lugs are welded onto the axle housings as in Fig. 15. Bolts passing through holes drilled in the lugs and the horizontal members of the frame hold it firmly in position. The upper end of the drive unit is bolted to a lug welded to the platform frame. Slots in the differential lug, or plate, Fig. 13, permit adjustment of the drive sprocket to the proper height with relation to the chain channel. The elevator chain need not run tightly as the weight of the chain ordinarily will give sufficient tension to prevent buckling. Note in Fig. 15 that the tires specified are of the airplane type and are mounted on 16-in. wheels. While tires of this type are satisfactory under ordinary field conditions, it may be necessary at times to use tire chains or casings with high-traction lugs in order to prevent slippage. The truck, or tractor pulling a trailer, should be driven at uniformly slow speed and the unit guided so that the pickup chains engage the end of the bale. To save time, bales which are dropped from the baler crosswise of the line of travel should be straightened before being picked up by the loader. As designed, the loader will pick up the standard size bale either flat or edgewise, depending on how it is dropped. If the larger, three-wire bales are handled, the elevator flight should be made correspondingly wider. Keep the drum and clutch units well lubricated to prevent undue wear on the parts.

Above, rear view showing curved platform fender which turns the bale at top of elevator. Below, differential and clutch are mounted on torque tube